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Southern Region

Appendices
Final Environmental Impact Statement for the Revised Land and Resource Plan

National Forests in Alabama

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Appendices to the Environmental Impact Statement

APPENDIX A
Summary of Public Involvement

Introduction

Because the land and resource management planning process determines how the lands of the National Forest System are to be managed, the public is encouraged to participate throughout the planning process. Public involvement is an important element in helping to identify issues and concerns regarding forest management and is vital to achieving sound management decisions. The National Forests in Alabama have conducted an extensive public involvement process that is ongoing.

The Interdisciplinary Team (IDT) charged with conducting the planning process has used a variety of methods and opportunities to involve the public directly, provide an opportunity for people to learn about forest management and the Forest Plan revision process, and encourage them to share their concerns. Appendix A briefly describes the steps taken to involve and engage the public in the planning process for revision of the Land and Resource Management Plan for the National Forests in Alabama. A complete record of public involvement is documented and on file in the Forest Supervisor's Office in Montgomery, Alabama.

Initial Public Outreach Efforts

- In a December 5, 1994 letter to the public, the Forest Supervisor of the National Forests in Alabama announced the formation of an Interdisciplinary Team (IDT) to begin the legally required revision of the Land and Resource Management Plan for the National Forests in Alabama.
- The "Alabama Treasures" newsletter was initiated in January 1995. This National Forests in Alabama newsletter was established to keep the public informed about the various planning stages throughout the entire Forest Plan Revision process. The first issue (Vol. I, No. 1) explained that opportunity for public involvement would occur in two major phases: (1) development of the AMS (Analysis Management Situation) and (2) during the NOI (Notice of Intent to Prepare an Environmental Impact Statement) comment period. Alabama Treasures is periodically mailed to about 2,000 people who have requested to receive information about the revision process.

Phase I: Development of the AMS

- On February 24, 1995, notice was published in the Federal Register (Vol. 60, No. 37) to identify the relationship between the SAA (Southern Appalachian Assessment) and the Forest Plan Revision of the National Forests in Alabama, among others. This notice disclosed that preparation of an AMS would begin and explained how the SAA would be used in those efforts.

- During February and March of 1995, the first public meetings were conducted at each of the six ranger districts to discuss the four required inventories (roadless areas, old growth timber, timber management suitability, and proposed, endangered, threatened, and sensitive plants and animals) leading up to development of the AMS. A total of 36 people attended these meetings.
- A series of public meetings was held at each of the six ranger districts during August of 1995 to discuss how public comments would be used in revising the Forest Plan. The Analysis of the Management Situation (AMS) was explained and input was solicited regarding the public's ideas on national forest issues and concerns and the changes needed in management direction of the national forests.
- In October 1995 a series of Listening Sessions were held in Birmingham, Huntsville, Montgomery, and Mobile. Individuals were given the opportunity to make short presentations regarding the changes needed and their desires for future management of the National Forests in Alabama during the first hour. General comments from the audience were taken during the last hour of each session.

Phase II: Notice of Intent to Prepare an Environmental Impact Statement

- The Notice of Intent to Prepare an Environmental Impact Statement (NOI) in connection with the revision of the revision of the Land and Resource Management Plan for the four national forests in Alabama was published in the Federal Register on August 1, 1996 (Vol. 61, No. 149). Publication of this notice began the formal "scoping" period and comments were requested through December 1, 1996.
- The comment period for the NOI was also disclosed in a National Forests in Alabama newsletter, Alabama Treasures (9/10/96).
- In conjunction with publication of the NOI, meetings were scheduled at each of the six ranger districts in August 1996 to explain the public's role in the planning process and to provide an opportunity for public input. Over 100 people attended these meetings.
- Listening Sessions were also held in Mobile, Montgomery, Huntsville, and Birmingham between October 31 and November 14, 1996, to provide the public with another forum to express comments. These sessions were announced in a statewide media release (10/18/96). Attendance totaled 130 for these sessions.
- The comment period for the NOI concluded on December 2, 1996. Because of the ID Team's multiple outreach efforts, more than 1,900 responses were received. A Public Comment Analysis was completed in January 1997 and found the following regarding public input:
    - 67% (1,304) was from six different form letters and post cards,
    - 18% (351) were form-type letters from school children,

- 12% (236) were individual letters,
- 3% (49) were oral comments;
- Seven petitions with 20,252 signatures were received;
- 44% (860) was from environmental organizations,
- 22% (438) were from motorized recreation interests,
- 18% (351) were from school groups or classes,
- 13% (256) were from individuals,
- 3% (44) were from other interests such as timber, recreation, state and local governments, local elected officials, Native American or tribal groups, and the professional society of foresters;
- No comments were received from federal government agencies, or federal or state elected officials.

Phase III: Analysis and Preparation of the Draft Environmental Impact Statement

- Presentation of draft mapped alternatives for four themes and the current management of National Forests in Alabama was made at a series of public meetings held in October and November 1998. Meetings were held at each of the six ranger districts and in Mobile, Montgomery, Huntsville, and Birmingham. These presentations provided a dialogue in beginning the final phase of alternative development and reaching a final range of alternatives to be considered in the Draft Environmental Impact Statement.
- In August 1999, meetings were held at each of the six ranger districts to share information on the status of the alternative development process and discuss the preliminary alternatives that had been developed (59 people attended).
- On September 28, 1999, public meetings were held at each of the six ranger districts (59 attended), and in October 1999, workshops were held in Birmingham and Montgomery (21 attended) to share information on the status of the planning process and discuss the draft version of the “rolling alternative”.
- In November 1999, workshops were again held in Birmingham and Montgomery (31 attended), and on December 27, 1999, additional meetings were held at each of the six ranger districts (55 attended) to disclose results and changes to the “rolling alternative”. Breakout sessions during the workshops allowed small groups to provide input to insure the issues were addressed by the alternatives.
- During April and May 2000, the ID Team hosted a series of meetings in Montgomery to discuss the watershed analysis for each of the ranger districts. The public (22 attended), as well as representatives from each ranger district, were invited to attend.
- Another series of public information sessions were held for each of the six ranger districts in August 2001. These meetings were conducted to review the planning process activities since publication of the NOI in 1996 and discuss the stages remaining in the Forest Plan Revision process.

- In August 2002, the ID Team held a series of meetings for each of the six ranger districts to present information on the Draft Forest Plan, a summary of Alternative I – the preferred alternative, and the status of the effects analysis. Attendance at these meetings totaled 55 with the majority attending the one held in Moulton for the Bankhead Ranger District.

Phase IV: Release of the Draft Environmental Impact Statement

- The Draft EIS and Proposed Revised Land and Resource Management Plan for the National Forests in Alabama were released for public comment in February 2003. Over 12,000 letters, emails, and postcards were received as comments on the Forest plans for the five forests in the Southern Appalachians.
- In April 2003, the ID Team hosted meetings in Birmingham and in Montgomery announcing the release and availability of the Draft documents. Attendance at these meetings totaled 65 with the majority attending the Birmingham meeting.
- The Interdisciplinary team reviewed the comments, responded to the comments and where necessary made changes in the Final EIS and Forest Plan based on these comments. The comments and responses are in Appendix J.

Appendix B
Analysis Process

Introduction - The Analysis Process and Goals

Appendix B presents a discussion of the analysis process. This appendix focuses on the methods and tools used to perform the analysis and documents how the analysis was done.

The goal of planning is to provide enough information to help the decision makers and the publics determine which combination of goods, services, and land allocations will maximize net public benefits (NPB). The regulations developed under the National Forest Management Act provide the analytical framework within which these decisions are made.

Information presented in this chapter supplements the broader and less technical descriptions included in the body of the EIS. This discussion includes basic assumptions, modeling components and inputs, rules, methods, and constraints. Additional information and documents used in the analysis process are contained in the process records. The process record in its entirety is incorporated here by reference.

Framework of the Planning Process

The general planning process described in *36 CFR 219.12* guides the revision of a Forest Plan. This section describes the ten steps that lead from the completion of a Forest Plan to the completion of a revised Forest Plan.

The 10-Step Planning Process

The 10-step process defined in the NFMA regulation was followed. This appendix describes the analysis phase of this process that includes steps 3 and 6. Steps 1, 2, 4, 5, 7, and 8 are described in Chapters 1, 2, and Appendix A of this EIS. Plan implementation and monitoring are discussed in the revised Forest Plan. The 10 steps are:

1. Identification of Purpose and Need: Issues, Concerns, and Opportunities
2. Planning Criteria
3. Inventory Data and Information Collection
4. Analysis of the Management Situation
5. Formulation of the Alternatives
6. Estimated Effects of Alternatives
7. Evaluation of Alternatives
8. Preferred Alternative
9. Plan Approval and Implementation

10. Monitoring and Evaluation

Inventory Data and Information Collection (Step 3)

The kind of data and information needed is determined in Step 2 based on the issues, concerns, and opportunities identified, and the resulting assessment of the management situation and determination of what needs to change. Data collection is part of normal forest operations. Existing data are used whenever possible and supplemented with new data, when practicable, if new data will contribute to more responsive analysis. Data accuracy is continually evaluated. Much of these data and background documentation are part of the planning process records on file.

Old Growth - Preliminary old growth inventory process began by querying the CISC database to select all stands over 100 years old. The resulting query was used to develop summary tables of tentative old growth that were shared with the public. All acres that met the age criteria for old growth were coded in CISC as old growth and treated throughout the analysis as such. Field verification of old growth and identification of previously undesignated old growth occurs through the stand examination process.

Database Development

The database for analysis consists of information related to the classification of the land into categories with unique properties and information not directly tied to the map base but has more to do with the estimation on how the resource will respond to management activities. Resource data sources utilized include:

CISC - Continuous Inventory of Stand Conditions

TIS - Transportation Information Systems

INFRA - INFRA Database

RIM - Recreation Inventory Management System

FIA - Forest Inventory and Analysis Data

Rainfall Data

Sample of Miles from stands to nearest road system

Program Budget Data

Census Data

Timber Sales Data

GIS Maps

US Topographic Maps

ANALYTICAL TOOLS USED

GIS

A geographic information system (GIS) links natural resource data with spatial information. This linkage enables valuable spatial analysis and rapid display of resource information for Forest planning. The GIS data layers formed a basis for the resource data used for programmatic analysis. All displayed and used for analysis are GIS acres. These acres were input into various models. Calculations and computations may have resulted in minor discrepancies in acres in various tables, however because this is a landscape level analysis rather than site specific, those discrepancies do not affect the outcomes. Table B-1 lists GIS data layers that were used in the formulation and the effects analysis of the alternatives.

Table B-1: List of Geographic Information Systems Coverages

COVERAGES	DESCRIPTION	TYPE
ADMIN	Administrative Boundaries (all boundaries)	ARC
ADMIN_FOREST	Administrative Boundaries	ARC
COMPARTS	Compartments Coverage	POLYGON
CONTOURS_BY_QUAD	Contour Lines by Quads	ARC
COUNTY	County Boundaries	POLYGON
DEM	Digital Elevation Model	IMAGE
DOQS_BY_QUAD	Digital Orthophoto Quad	IMAGE
DRGS_BY_QUAD	Digitized Raster Graphic	IMAGE
LTA	Land Type Association	POLYGON
RCW	Red Cockaded Woodpecker	POINT
RIGHTS_WAY	Rights-of-Way Coverage	ARC
ROADS	Roads Coverage	ARC
SECTIONS	Section Lines	POLYGON
SMS	Scenic Management systems	POLYGON
SOILS	Soils Coverage	POLYGON
SPEC_INT_MGT	Special Interest Management	POLYGON
SPU	Special Uses	ARC
STANDS	Stands Coverage	POLYGON
STATE	State boundary	POLYGON
STREAMS	Streams Coverage	ARC
STREAMS_ORDER	Stream Order Coverage	ARC
SUBSURF_OWN	Subsurface Ownership	POLYGON
SURFOWN	Surface Ownership	POLYGON
TOWNSHIPS	Township and Range	POLYGON
TRAILS	Trails Coverage	ARC
TRAVEL_ROUTE	Roads and Trails (Routes)	ARC, ROUTE
UTIL	Utilities Coverage	ARC
WATER	Water Coverage	POLYGON
WILDERNESS	Wilderness Coverage	POLYGON

Alternative Mapping Process

Join the Geographic Information Systems (GIS) Stands coverage to the Continous Inventory of Stands Condition (CISC) table using ArcView. The CISC table at a minimum consists of forest type, age year, and land class.

Create three fields in the stands coverage – age_class, spcl_mgt and community. Populate these added fields using the available data from CISC.

Age class – derived from the age year field in the CISC table.

Spcl_mgt – derived from the forest type field in the CISC table (non-forest areas).

Community – derived from the forest type field in the CISC table.

Union the stands coverage to incorporate any prescription shapefile (i.e. scenic corridors, wilderness, roadless areas, botanical areas, study areas, etc.)

Create nine fields and name these with the prospective alternative (i.e. A, B, C, etc.)

Edit the attribute of stands table to populate each of the alternative fields.

After making the necessary edits to the stands coverage, convert the shapefile to an ArcInfo coverage as the official prescription coverage.

Re-calculate the acres for the new coverage.

Perform this process for each district on the forest.

Spectrum

The Forest developed its Model for FLMP using the User's Guide (Guide) provided by the USDA Forest Service's Inventory and Monitoring Institute in Fort Collins, CO. The Forest used Spectrum Version 2.5 dated October 23, 2000, as supplemented by periodic updates to the Model.

The Guide states, in part:

"SPECTRUM is an LP-based forest planning model used to optimize land allocation and activity and output scheduling for a forest over a specified planning horizon. It includes a data entry system, model manager, matrix generator, and report software. A commercial LP package is used to solve the LP matrix generated by SPECTRUM. The matrix generator reads and interprets model data and creates rows and columns for the LP software to solve. The report utilities interpret the LP solution and produce a series of reports and database files." (Guide, Overview, pg. 1).

The commercial linear programming (LP) software used to solve the Model is C-Whiz from Ketron Management Science, Arlington, VA. The Forest used Version 1.4.

COMMON ASSUMPTIONS USED

The Model(s) were "built" based on several Assumptions:

The Forest Land Management Plan (Plan) will be a strategic Plan that will guide broad land-based decisions to implement certain Goals and Objectives.

That "on-the-ground" decisions are best left to the professional with actual knowledge of the landscape, vegetative types and site conditions. And, that this professional will utilize the implementation guides or Standards to meet the Goals and Objectives of the strategic Forest Land Management Plan.

That SPECTRUM is sufficient for strategic planning.

That, as a general rule, the IDT would accept an "error" rate of plus (+) or minus (-) ten percent (10%) within any division of National Forest land, for any Activity, Output or Condition.

BASIC MODEL STRUCTURE -- An Overview

Planning Horizon

The Forest IDT chose a Planning Horizon of 200 years with a Beginning Year of 2000. Each model Period is ten (10) years, and the Model spans 20 Periods.

Layer Identifiers and Land Stratification

Land stratification is accomplished through Layer Identifiers, composed of Layers 1 through 6. This stratification scheme, when taken in its aggregate, is a representation of one (1) acre of National Forest land. All like acres are termed an Analysis Unit (AU). It is on these AUs that various Management Prescriptions (MGTRX) and their associated Emphases (MGTEMP) and Intensities (MGTINT) are applied.

Layer 1 – Management Area: A representation of the major divisions of National Forest Land.

- Bankhead National Forest
- Conecuh National Forest
- Oakmulgee Division, Talladega National Forest
- Talladega Division, Talladega National Forest
- Tuskegee National Forest

Layer 2 – Unique Areas: Discrete areas including Wilderness Areas, Wilderness Study Areas, Wild and Scenic Rivers, Botanical Areas, non-forested areas, Administrative sites, etc.

Layer 3 – Management Prescriptions: Management prescriptions developed during the public involvement process for the different alternatives.

Layer 4 – Community Types: Representation of the current overstory community type and understory associations.

Layer 5 – Overstory Age: Overstory age of the predominant species within the community types.

Layer 6 – Land Class: A broad classification the generally depicts those lands that are upland or riparian, non-productive, steep slopes, or have some limitation that would affect the manipulation of the overstory for management prescription objectives.

Management Prescriptions

Historically, Layers 7 and 8 have been used to define Management Prescriptions (MGTRX) with Layer 7 being an Emphasis (MGTEMP), and Layer 8 defined as an Intensity (MGINT). In general, the Intensities would vary and present differing scenarios for implementing an Emphasis. Each Intensity would have its discrete costs and outputs. The Model would "choose" the most mathematically optimal mix that met the various Constraints imposed on the Model, and the Objective Function under which the model ran.

For this FLMP, much of the management prescription allocations for the alternatives wee developed through discussions/negotiations with our local publics, and through the coordinated approach to addressing issues between the National Forests in the Southern Appalachians. These MGTRX are now found at Layer 3 in the land stratification section.

In this context, Layers 7 and 8 take on a new meaning. Layer 7 is still termed an Emphasis, but is used to define broad ways to implement a predefined MGTRX. Layer 8 shows some variation for implementing the Emphasis.

Activities, Outputs and Conditions (A/O/C)
Activities can be considered the "costs" of doing business and, generally, have a dollar value associated with them. An example might be the cost of planning and administering a timber sale, or implementing wildlife improvement work.

Outputs are generally a representation of what is produced on an AU. They may, or may not, be valued. An example would be the volume of timber products grown per acre and their associated dollar value; or acres that meet a requirement for certain wildlife species.

Conditions are structurally treated like Outputs in SPECTRUM. The Forest has chosen to model Conditions as some representation of the Community Type (COMTYP) species found on each AU. An example is the different seral stages that are "produced" as the Model ages and changes based on the MGTEMP and MGTINT that come into solution.

Economics
The Economics section defines the dollar values associated with Activity costs, and the revenues of the valued Outputs. Costs used in the SPECTRUM model include the average costs for harvesting activities for each major division of land (management Area). Revenues include estimated value of timber harvested based on historical values.

Table B-2: Average Costs Per Acre

	Average Costs Per Acre by Management Area				
Activity	BK	CN	OK	TL	TK
Inventory and Examination	$5.18	$4.09	$4.40	$4.29	$4.92
Harvest Prep. And Administration	$49.70	$22.13	$19.84	$34.71	$15.54
Reforestation	$286.00	$286.0	$286.00	$286.00	$286.00
TSI	$156.69	$156.69	$156.69	$156.69	$156.69
Harvest	$87.85	$59.08	$40.42	$77.59	$58.68

Table B-3: Average Revenue/MCF

	Average Revenue Per MCF by Management Area				
Product	BK	CN	OK	TL	TK
Softwood Sawtimber	$997.24	$1,408.42	$1,137.27	$997.24	$1,137.27
Softwood Pulpwood	$193.60	$235.99	$212.38	$193.60	$212.38
Hardwood Sawtimber	$224.37	---	$500.52	$224.37	$500.52
Hardwood Pulpwood	$78.42	---	$114.46	$78.42	$114.46

Treatment Types and Qualifiers

The Forest developed a unique way of using Treatment Types (TT) to model timber volumes that contribute to Long Term Sustained Yield (LTSY) and Allowable Sale Quantity (ASQ); and to track those volumes that do not contribute to LTSY and ASQ.

It is recognized that some MGTEMP allow for the harvest of the timber resource to provide goods and services through their various products. These volumes on lands that are termed “suitable” would count in the calculation of LTSY and ASQ.

Some MGTEMP allow for the harvest of the timber resource for other objectives, such as wildlife habitat improvement. These volumes would not contribute to LTSY and ASQ, but their products may be tracked and/or valued. The use of these two TT conventions allows for a more pragmatic representation in strategic planning. The Forest used the SPECTRUM defaults for Qualifiers.

Yield Composites and General Relationships

Yield Composites (YC) “link” all A/O/Cs into a logical sequence and are a major component in modeling. It is in this section that the bulk of the relationships that exist among A/O/Cs are found. Relationships may be simple or complex; Time-, Age- or Sequence-based; span a range of Periods; and be found in the YC or the Yield Files.

The Forest developed two YCs:

NOAGE (No Age) is used for theming A/O/Cs on all AUs that do not have a COMTYP associated with them. An example would be Administrative Sites or Non-Forested areas.

VEGMGT (Vegetative Management) is used for all AUs that have a COMTYP where tracking of the overstory through time is important, or where overstory manipulation takes place. An example might be the harvest of timber to restore a COMTYP, wildlife considerations, or a “Grow Only” MGTEMP that promotes “old growth.”

Management Actions

Management Actions (MA) take each discrete “set” of MGTEMP and MGTINT that compose “choices” and relate them to the AUs on which they apply. It is in this section that “choices” are “themed” to AUs. Appendix B shows the various combinations modeled.

Since each Alternative may have differing sets of MAs that apply, these are found in each Alternative's Addendum.

Schedules

The scheduling section of SPECTRUM generally is used to define the entry timing for all vegetative manipulation (thins, final harvest, shelterwood patterns, "grow only," or uneven aged management regimes); or they may be time-based. These may differ for each Alternative dependent upon the A/O/C modeled in the Yield File. They are found with each Alternative's Addendum.

Objective Functions and Constraints

Objective Functions (OBJ) set a "goal" for the model to optimize. OBJ may be Maximize, Minimize, or some combination of the two. Goal formulations are also possible within SPECTRUM. The OBJ is subject to the Constraints entered into the model.

The Forest uses Maximize Present Net Value (PNV) for all its final solutions. Secondary OBJs may be used prior to running PNV in what is termed a "rollover" run. Examples a secondary OBJ might be: Maximize Timber Volume; Minimize Timber Volume; Maximize Late Seral Stage Vegetation; or Maximize Old Growth.

Constraints "limit" the model to certain parameters. Constraints, as developed by the IDT, are of three basis types: Threshold, Flow and Relational.

Threshold Constraints generally follow the format of =, <=, or >= to some constant.

Flow Constraints allow for the fluctuation of some A/O/C through time, generally based on some percentage change from one Period to the next.

Relational Constraints "relate' the change of one A/O/C to another A/O/C through time; again, generally based on some percentage change from on Period to the next.

Minimum Level Management

In a "grow only" or "minimum level" Management Prescription, a Yield Composite is developed and timber volumes are entered for each Time Period with a Treatment Type of Final Harvest without Long Term Sustained Yield (LTSY), and the Final Harvest Timing is set outside the Planning Horizon. The stand is never harvested; therefore, it continues to "grow." This structure is good for those Management Prescriptions associated with dispersed recreation, wilderness or other non-timber related actions which may require the tracking of compositional overstory change through time, but do not require the manipulation or tracking of the timber resource component. The acres by ten-year age group, for each major specie (YELPNE, etc.), may be reported on by any Level Identifier for any Alternative.

Yield Files

Yield Files (YF) are of three basic types: Time, Age or Sequence. It is in the YFs that much of the A/O/Cs are displayed.

The Forest uses primarily Age and Sequence YFs. Age YFs are used to model overstory manipulation or change through time (thin, final harvest, "grow only," etc.) and contain the bulk of the timber volume data.

Sequence YFs, as the Forest has used them, are unique in their application. These YFs are used to model COMTYP changes through time based on "what happens" to that overstory. As an example:

A Community Type may be allowed to grow in perpetuity; or be harvested with no change in Community Type. In this instance, the Sequence YF would model no change through time.

A Community Type growing on off-site conditions, at regeneration, would be restored to a Community Type that is more conducive to the site. In this case, the Sequence YF would model this change.

The modeling of overstory change through time using Sequence YFs has great potential for analyzing wildlife conditions (and their associated seral stages), and recreational opportunities.

Reports

Reports are developed as needed for each IDT member in order to analyze the effects of the various Alternatives.

Estimated Effects of Alternatives (Step 6)

Chapter 2 of the EIS summarizes and compares the alternatives that were developed as potential management strategies for the National Forests in Alabama. Chapter 2 contains tables that display the impact of the alternatives on each issue. The environmental effects of the alternatives are discussed in detail in chapter 3 of the EIS.

During construction of the alternative models, several trial runs were made to test the effects of the allocation, prescriptions, and constrains on the model out puts. The following table displays the outcomes of some of these runs.

Table B-4: NPV for Benchmarks and Alternatives

OBJECTIVE FUNCTION VALUES - National Forests in Alabama

Alternative	OBJ Function Value (1)	Description
A	199151712	Maximize PNV, subject to model Constraints.
B	186817840	Maximize Restoration Prescriptions; then Maximize Present Net Value (PNV), subject to model Constraints.
D	222288576	Maximize VOLUME; then Maximize PNV, subject to model Constraints.
E	168233104	Maximize Early Seral Stage on selected Management Prescriptions; then Maximize PNV, subject to model Constraints.
F	222701952	Maximize VOLUME; then Maximize PNV, subject to model Constraints.
G	179483616	Maximize Mid- to Late Seral Stages on selected Management Prescriptions; then Maximize PNV, subject to model Constraints.
I	177877568	Maximize Restoration Prescriptions; then Maximize PNV, subject to model Constraints.
STAGE2	427783104	Maximize PNV, no Constraints.
MAXTBR	303076448	Maximize VOLUME; then Maximize PNV, subject to Harvest Policy Constraints only.

Alternative	OBJ Function Value (1)	Description
MAXPNV	303040032	Maximize PNV, subject to Harvest Policy Constraints only.
MINLVL	(4602034)	Minimize VOLUME; then Maximize PNV, subject to minimum RCW Constraints only.

(1) OBJ Function Values are for PNV.

Benchmark Analysis

Benchmark analysis is specified in the NFMA regulations in 36 CFR 219.12(e) as part of the AMS. Selection of those benchmarks to develop is dependent upon the revision topics. Benchmarks assist in defining the range within which alternatives can be constructed. Three benchmarks are relevant to the timber revision topic. They are:

1. Maximizing the present net value of the timber program.
2. Maximizing timber production in the first decade.
3. Minimizing costs of the timber program.

The NFMA regulations in 36 CFR 217.27 list management requirements that must be considered in benchmarks. The following basic management requirements were included in the benchmark SPECTRUM models:

- Timber harvest regulations.
- Nondeclining flow and long-term sustained yield.
- The ASQ only generated from tentatively suitable timber lands.
- Water quality and watershed protection.
- Riparian protection. – (Riparian Acres were not taken out of the benchmarks)
- Base level of visual resource protection.

Timber Suitability Analysis

NFMA regulations (36 CFR 219.14) require that lands not suitable for timber production be identified. This process involves three stages of analysis. Stage I analysis identifies lands tentatively suitable for timber production. Stage II explores the financial aspect of varying intensities of timber management on lands identified as tentatively suitable from Stage I. Stage III identifies lands as unsuited for timber production under the alternative selected in the Revised Forest Land And Resource Management Plan.

Stage I: Physical Suitability

Stage I analysis involves these categories:

Lands that do not meet the definition of forest land.

Lands that have been administratively or congressionally withdrawn from timber production by and act of Congress, the secretary of agriculture, or the chief of the forest service.

Lands incapable of producing industrial wood.

Lands where technology is not available to ensure timber production without irreversible damage to soils productivity, or watershed conditions

Lands where there is no reasonable assurance of adequate restocking.

Lands where there is inadequate information.

Table B-5 displays the Stage I analysis for the National Forests in Alabama by Management Area.

Table B-5: Stage I Suitability Analysis – Tentatively Suitable Acres

Stage I – Suitability	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
Total Acres	181,808	83,991	157,700	230,516	11,211	665,226
Wilderness*	-21,570	0	0	-15,897	0	-37,467
WSR*	-8514	0	0	0	0	-8,514
RNA*	0	0	-602	0	0	-602
Water	-1249	-338	0	-2338	-76	-4,001
Non-forest	-3450	-1194	-2024	-3534	-350	-10,552
Incapable	-1531	-461	0	0	0	-1,992
Unproductive	-73	0	0	-104	0	-177
Sensitive Soils	-1218	-12,600	-10,438	-56	-62	-24,374
Tentatively Suitable	144,203	69,398	144,636	208,587	10,723	577,547

Stage II: Financial Analysis

Stage II does not identify any lands as unsuitable for timber production, but explores the financial efficiency of different intensities of management on lands identifies as tentatively suitable in stage I. For this analysis the Spectrum model was run for all alternatives with constraints turned off except RCW constraints, long-term sustained yield, and non-declining flow on timber. All of the analysis areas and prescriptions offer a positive PNV.

Stage III: Identification of Suitable acres

Stage III analysis is accomplished during the formulation and evaluation of alternatives and considers the results of the Stage II analysis. Lands are identified as not appropriate for timber production to meet the objectives of alternative being considered if:

Based upon consideration of multiple-use objectives for the alternative, the land is proposed for resource uses that preclude timber production. However, in some management prescriptions that are classified as unsuitable for timber production, timber harvest may occur to meet the desired condition of other resources.

Other management objectives for the alternative limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met.

The lands are not cost-efficient, over the planning horizon, in meeting forest objectives, which includes timber production.

The following tables display the results of the Stage III analysis.

Table B-6: Stage III Total

	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
Tentatively Suitable	144,203	69,398	144,636	208,587	10,723	577,547
Riparian	-14,995	-13,317	-31,040	-20,382	-1897	-81,631
Steep Slopes	-5941	0	-2387	-32,974	0	-41,302
RCW, TES	0	-2515	-6694	-8010	0	-17,219
Un-inventoried	-1351	0	0	-2555	0	-3,906
Total	121,916	53,566	104,515	144,666	8,826	433,489

Table B-7: Alternative A

Alternative A	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
Total	121,916	53,566	104,515	144,666	8,826	433,489
12A/12B Remote	-62	-3023	0	-491	0	-3576
1B Recommended Wilderness	0	0	0	-832	0	-832
2C Eligible WSR	0	-89	0	0	0	-89
4C Geologic Area	0	-46	0	0	0	-46
4D Botanical	-1848	-23	0	0	-52	-1923
4E Heritage	-12020	0	0	0	-8	-12028
4I Natural Area	0	0	0	0	0	0
4L Canyon corridor	0	0	0	0	0	0
Bogs	0	-57	0	0	0	-57

Alternative A	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
0. Custodial	-299	0	0	-283	0	-582
7D	-2493	-1090	-458	-293	-66	-4400
7A	0	0	0	-2818	0	-2818
7B	0	0	0	-4904	-163	-5067
Total Suitable	105,194	49,238	104,057	135,045	8,537	402071

Table B-8: Alternative B

Alternative B	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
Total	121,916	53,566	104,515	144,666	8,826	433,489
12A/12B Remote	-62	-3023	0	-491	0	-3576
1B Recommended Wilderness	0	0	0	-832	0	-832
2C Eligible WSR	0	-89	0	0	0	-89
4C Geologic Area	0	-46	0	0	0	-46
4D Botanical	-1848	-23	0	0	-52	-1923
4E Heritage	-12020	0	0	0	-8	-12028
4I Natural Area	0	0	0	0	0	0
4L Canyon corridor	0	0	0	0	0	0
Bogs	0	-57	0	0	0	-57
0. Custodial	-96	0	0	-283	0	-379
7D	-2493	-1090	-458	-493	-66	-4600
7A	0	0	0	-2818	0	-2818
7B	0	0	0	-8166	-163	-8329
Total Suitable	105,397	49,238	104,057	131,583	8,537	398812

Table B-9: Alternative D

Alternative D	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
Total	121,916	53,566	104,515	144,666	8,826	433,489
12A/12B Remote	-62	0	0	-491	0	-553
1B Recommended Wilderness	0	0	0	-832	0	-832
2C Eligible WSR	0	-89	0	0	0	-89
4C Geologic Area	0	-46	0	0	0	-46
4D Botanical	-1848	-23	0	0	-52	-1923

Alternative D	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
4E Heritage	-12020	0	0	0	-8	-12028
4I Natural Area	0	0	0	0	0	0
4L Canyon corridor	0	0	0	0	0	0
Bogs	0	-57	0	0	0	-57
0. Custodial	0	0	0	-283	0	-283
7D	-2493	-1090	-458	-493	-66	-4600
7A	0	0	0	-2818	0	-2818
7B	0	0	0	0	0	0
Riparian	14,995	13,317	31,040	20,631	1956	81939
SMZ	-7797	-746	-4902	-12725	-506	-26676
Total Suitable	112,691	64,832	130,195	147,655	10,150	465523

Table B-10: Alternative E

Alternative E	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
Total	121,916	53,566	104,515	144,666	8,826	433,489
12A/12B Remote	-62	-3023	0	-7784	0	-10869
1B Recommended Wilderness	-4153	0	0	-832	0	-4985
2C Eligible WSR	0	-89	0	0	0	-89
4C Geologic Area	0	-46	0	0	0	-46
4D Botanical	-1848	-23	0	0	-52	-1923
4E Heritage	-12020	0	0	0	-8	-12028
4I Natural Area	0	0	0	0	0	0
4L Canyon corridor	0	0	0	0	0	0
Bogs	0	-57	0	0	0	-57
0. Custodial	-96	0	0	-283	0	-379
7D	-2493	-1090	-458	-493	-66	-4600
7A	0	0	0	-2818	0	-2818
7B	0	0	0	-3118	-163	-3281
Total Suitable	101,244	49,238	104,057	129,338	8,537	392414

Table B-11: Alternative F

Alternative F (Current)	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
Total	121,916	53,566	104,515	144,666	8,826	433,489
12A/12B Remote	-4242	0	0	-2705	0	-6947
1B Recommended Wilderness	0	0	0	-832	0	-832
2C Eligible WSR	0	0	0	0	0	0
4C Geologic Area	0	-46	0	0	0	-46
4D Botanical	-1848	-23	0	0	-52	-1923
4E Heritage	-12020	0	0	0	8	-12012
4I Natural Area	0	0	0	0	0	0
4L Canyon corridor	0	0	0	0	0	0
Bogs	0	-57	0	0	0	-57
0. Custodial	-96	0	0	-283	0	-379
7D Developed Rec.	-2493	-1090	-458	-493	-52	-4586
7A Scenic Byway Corridor	0	0	0	-2818	0	-2818
7B Scenic View Shed	0	0	0	0	0	0
Riparian	14,995	13,317	31,040	20,631	1956	81939
SMZ	-7797	-746	-4902	-12725	-506	-26676
Total Suitable	108,415	64,921	130,195	145,441	10,180	459152

Table B-12: Alternative G

Alternative G	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
Total	121,916	53,566	104,515	144,666	8,826	433,489
12A/12B Remote	-62	0	0	-491	0	-553
1B Recommended Wilderness	0	0	0	-832	0	-832
2C Eligible WSR	0	-89	0	0	0	-89
4C Geologic Area	0	-46	0	0	0	-46
4D Botanical	-1848	-23	0	0	-52	-1923
4E Heritage	-12020	0	0	0	-8	-12028
4I Natural Area	0	0	0	0	0	0
4L Canyon corridor	0	0	0	0	0	0
Bogs	0	-57	0	0	0	-57

Alternative G	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
0. Custodial	-96	0	0	-283	0	-379
7D	-2493	-1090	-458	-493	-66	-4600
7A	0	0	0	-2818	0	-2818
7B	0	0	0	-3118	-163	-3281
Total Suitable	105,397	52,261	104,057	136,631	8,537	406883

Table B-13: Alternative I

Alternative I	Bankhead	Conecuh	Oakmulgee	Talladega	Tuskegee	NFsAL
Total	121,916	53,566	104,515	144,666	8,826	433,489
12A/12B Remote	-4234	0	0	-9324	0	-13558
1B Recommended Wilderness	0	0	0	-832	0	-832
2C Eligible WSR	0	-89	0	0	0	-89
4C Geologic Area	0	-46	0	0	0	-46
4D Botanical	-1848	-23	0	0	-52	-1923
4E Heritage	-12,020	0	0	0	-8	-12028
4I Natural Area	0	-258	0	0	0	-258
4L -Canyon corridor	-2165	0	0	0	0	-2165
Bogs	0	-57	0	0	0	-57
0. Custodial	-899	0	0	-283	0	-1182
7D Developed Rec.	-2493	-1090	-458	-493	-66	-4600
7A Scenic Byway Corridor	0	0	0	-2818	0	-2818
7B Scenic View Shed	0	0	0	-4290	-163	-4453
Total Suitable	98,257	52,003	104,057	126,626	8,537	389,480

Vegetation Management/Silvicultural Prescriptions

The vegetation plot data was stratified into community types by management area. Community types that were similar and would receive similar treatments were combined and modeled together. The data was also separated into the following age classes: 0-10, 11-30, 31-60, 61-80, 81-100, and 101+. Yield tables were produced with the following products: Pine pulpwood, Pine Sawtimber, Hardwood Pulpwood, Hardwood Sawtimber, Total Cubic foot volume. The following general options were considered: Grow Only, Final Harvest Only, Thins and Final Harvest, uneven-aged management. A range of management options were developed to encompass the management prescriptions, alternatives, and to provide a reasonable number of economic options. Variations in rotation ages, community type, silvicultural systems, thinning regimes, current age, restoration objectives, management area, final harvest options resulted in the creation of many individual prescriptions. An example of 17 prescriptions available for the Dry and Dry-Mesic Oak-Pine community (predominantly loblolly pine) on Management area 5 (Tuskegee National Forest) would be:

Final harvest at age 40, regenerate to upland longleaf

Final harvest at age 50, regenerate to upland longleaf

Final harvest at age 60, regenerate to upland longleaf

Final harvest at age 70, regenerate to upland longleaf

Thin at age 20, final harvest at age 40, 50, or 60, regenerate to upland longleaf

Thin at age 20 and at age 40, final harvest at age 60 or 70, regenerate to upland longleaf

Thin at age 40, final harvest at age 60 or 70, regenerate to upland longleaf

Final harvest at age 90, 100, 110, 120, or 130

Grow (no harvest)

Final harvest options include even-aged methods as described in Appendix E. Uneven-aged methods were not included in the modeling effort because the yields provided by the thinning options that were modeled are very similar to the yields produced from uneven-aged methods, and were used for this analysis.

Timber Yields

Timber yields were developed using the Forest Vegetation Simulator (FVS), an individual-tree, distance-independent growth and yield model. Forest Inventory and Analysis (FIA) date from Alabama was pre-processed using the Pre-suppose program to meet the analysis criteria, then processed with FVS to produce yields using several different scenarios or prescriptions. A sample of the yield tables were compared with yield from actual sales from the last 10 years to determine it the model was providing reasonable information. Yield tables were formatted for input into the spectrum model.

The IMPLAN Model – Economic and Local Government Impact Analyses

The purpose of this portion of Appendix B is to provide interested readers with additional details regarding the social and economic analyses. This section does not provide sufficient information to replicate the analysis. For that level of detail, the companion specialist reports contained in the administrative record should be consulted.

The Models

Economic effects to local counties were estimated using an economic input-output model developed with IMPLAN Professional 2.0 (IMPLAN). IMPLAN (Impact Analysis for Planning) is a software package for personal computers that uses the latest national input-output tables from the Bureau of Economic Analysis. The software was originally developed by the Forest Service and is now maintained by the Minnesota IMPLAN Group, Inc (MIG). Data used for the impact analysis was from secondary data for those counties considered to be in the forests' impact areas. County data is used in the model to develop economic impact response coefficients for the analysis area (defined by the county data selected).

Input-output analysis gives estimates of employment and income for an increase in final demand on certain sectors of the economy. For Forest Service timber, for example, we have looked at the sawmill and pulpwood industries where our timber goes as the first processing step in manufacturing. Impacts include all those industries initially impacted, as well as those industries linked with supplying inputs to production, as well as workers in those industries who spend wages in their households (known as direct, indirect and induced effects, respectively). Thus, the impact assumes a new demand is made on the economy and estimates what that new this new increase in final demand will mean in employment and income to that economy. Input-out put modeling (an efficiency analysis that tells how income and jobs are distributed throughout and economy for a given economic impact) has nothing to do with benefit-cost (an efficiency analysis that estimates how efficient monies are spent on investment activities.

The assumption used in this modeling process was that the impact area comprised the counties within the forests' designated county boundaries. The data source used in developing the Southern Appalachian Forest models for impact purposes was the most recent data available from MIG (1998).

Dependency Analysis

The IMPLAN model was used to assess the economic dependencies of the Southern Appalachian National Forests' planning area. Economic dependency is a way of assessing the strength of regional or local economies. Regional economies generally depend on their exports to sustain most local income and employment. Based on this data, it is reasonable to estimate economic dependency by examining an area's export base. The export base analysis done for this EIS measured the total contribution of one sector, or industry to the economy. Industries can import and export similar commodities. Those industries having more exports than imports are considered “basic”, and thereby allow “new” money to enter the economy. Basic industries allow an economy to grow.

Diversity Analysis

Using IMPLAN employment and income reports, forest planners illustrated the relative importance of major sectors and industries, such as wood products, and tourism. Employment, industrial output, and total income to workers and proprietors were contrasted to the total for the entire forest economy to gauge the percentage relationship between the two. Using IMPLAN models from two years (1985 and 1996), a change in economic characteristics in illustrated. The Shannon-Weaver Entrophy Indexes were also used to show relative diversity of counties and states.

Forest Contribution and Economic Impact Analyses

An impact analysis describes what happens when a change in final sales (e.g. exports and residents) occurs for goods and services in the model region. Changes in final sales are the result of multiplying production data (e.g., head months of grazing or recreation visitor trips) times sales. Economic impacts were estimated for 2010 using the expenditure data for recreation, wildlife and hunting (U.S. Forest Service’s National Visitor Use and Monitoring data, (NVUM), and the Fish & Wildlife Service’s wildlife use data, respectively); stumpage estimates for timber, market prices for minerals, and estimated animal allotment prices for Range. NVUM data were used by Daniel J. Stynes and Eric White, Michigan State University, July 2002, to estimate spending profiles of recreation users. The USDA Forest Service Inventory and Monitoring Institute, Ft. Collins, CO, estimated spending profiles from the 1996 U.S. Fish & Wildlife Service’s wildlife data.

Impacts to local economies are measured in two ways: employment and total income. Employment is expressed in jobs. A job can be seasonal or year-round, full-time, or part-time. The income measure used was total income expressed in 2000 dollars. Total income includes both employee compensation (pay plus benefits) and proprietors income (e.g. self-employed).

Data Sources

The planning area IMPLAN models were used to determine total consequences of dollar, employment, and income changes in selected sectors. Because input-output models are linear, multipliers or response coefficients need only be calculated once per model and then applied to the direct change in final demand. A Forest Service-developed spreadsheet known as “FEAST” (Forest Economic Analysis Spreadsheet Tool) was used to apply the IMPLAN impact results to each alternative, expressed in units of output. FEAST transformed the dollar impact for a given industry from IMPLAN to the resource output by alternative into a specific employment and dollar output. Specifications for developing IMPLAN response coefficients and levels of dollar activity are stated below.

Timber
Sales Data – Sales data was determined by using timber values multiplied by estimated production levels for each alternative.

Use of the Model – Hardwood and softwood saw-timber were processed through the sawmill industry. Hardwood and softwood roundwood were assumed to processed at the pulp mill. In the absence of a pulp mill in the local economy, roundwood was assumed to be exported out of the analysis area. Impacts represent the economic activity occurring in all backward linking sectors associated with the final demand output of the timber industries described above. For the Sumter NF, pulp mills did not exist in the analysis area. Therefore, it was assumed roundwood was exported out of the impact area.

IMPLAN showed that for every $1 million of total timber production in the forest impact area, a given level of dollar value of logs going into the mill result in this impact. Some of this output may be exported and generate new money for the local economy.

Range
Sales Data—The best available data for agriculture is found in the 1997 Census of Agriculture. From this census, data for farm livestock inventory was used. Animal months of grazing on forest land were provided from the USDA Forest Service "Annual Grazing Report". This unit of use information was placed in FEAST to link with IMPLAN impact data in dollars to yield an impact for the range resource per unit of grazing (AUM).

Recreation and Wildlife/Fish
Expenditure Data — Recreation and wildlife, and hunting trips were derived from the National Visitor Use and Monitoring survey, 2001 (NVUM) that is done for one-quarter of the National Forests each year. For those forests that have not been surveyed, data from a surveyed Appalachian forest served as proxy data, and adjustments were made by forest personnel based on pre-NVUM work for that forest. The resulting calculations yielded trips for resident and non-resident day, on National Forest overnight use, and off National Forest overnight use. These use metrics were entered into FEAST to link with IMPLAN impact response coefficients to yield an impact for recreation and wildlife resources.

While some analysts may not include resident participation in local economy impacts because there may be substitution opportunities for local residents to spend their discretionary dollar, we decided to include resident expenditures in the local economy with the caveat that these expenditures were "associated" with the impacts not "responsible" for causing the impacts.

Federal Expenditures and Employment
Expenditure Data – A Forest budget was estimated for each alternative, and these estimates were used for forest expenditures, some of which had local economic effects. Total forest obligations by budget object code for FY 2000 were obtained from the National Finance Center and used to identify total forest expenditures. The

proportion of funds spent by program varied by alternative according to the theme for that alternative. Forest Service employment was estimated by the forest staff based on examination of historical Forest Service obligations.

Use of the Model – To obtain an estimate of total impacts from Forest Service spending, salary and non-salary portions of the impact were handled separately. Non-salary expenditures were determined by using the budget object code information noted above. This profile was run through the model for non-salary expenditures per one million dollars, and the results multiplied by total forest non-salary expenditures. FEAST was again used to make the calculations. Local sales to the federal government are treated in the same manner as exports.

Salary impacts result from forest employees spending a portion of their salaries locally. IMPLAN includes a profile of personal consumption expenditures for several income categories; the average compensation for an employee on the Southern Appalachian National Forests fell in the category of $30,000-$39,999.

Revenue Sharing – 25% Fund Payments

Expenditure Data – Until September 30, 2001, Federal law required that 25% Fund Payments were used for only schools or roads, or both. A split of 50 percent for schools and 50 percent for roads was used. One profile of expenditures was developed from within the county forest boundary model for: 1) the highway construction sector, and 2) local educational institutions. Because counties can choose to continue payments under this formula, traditional payments were analyzed (we assumed 50 percent of payments went to roads and 50 percent to education). Should counties choose fixed payments under the new law, the impacts would not vary by alternative. The impact of the fixed payment was not calculated.

Use of the Model – The national expenditure profile for state/local government education (schools) and local model estimates for road construction (roads) are provided within IMPLAN. One million dollars of each profile was used to obtain a response coefficient for these Forest Service payments to impact area counties. Sales to local government are treated in the same manner as exports.

Output Levels

Output levels for each item listed above can be viewed in various Forest FEAST spreadsheets files contained in the process record.

Financial and Economic Efficiency Analysis

Financial efficiency is defined as how well the dollars invested in each alternative produce revenues to the agency. Economic efficiency is defined as how well the dollars invested in each alternative produce benefits to society. Present Net Value (PNV) is used as an indicator of financial and economic efficiency.

The Southern Appalachian forests used a Microsoft Office Excel electronic spreadsheet to calculate PNV for each alternative over a 50-year period. A 4 percent discount rate was used. Decadal and 50-year cumulative present values for program benefits and costs, as well as present net values are the product of this spreadsheet.

For each decade, an average annual resource value was estimated, multiplied by 10 years, and discounted from the mid-point of each decade.

The financial values for range came from RPA estimates updated to 2000 dollars. The values for timber came from average 2000 stumpage prices. The values for minerals came from market prices for minerals from the Minerals Management Agency. The values for recreation and wildlife came from RPA updated to 2000 dollars. All values are in 2000 dollars.

For the recreation and wildlife values, a conversion factor of 1.629 was used to convert from RVDs to "Visits". This factor was determined by taking the weighted average of hours for a site visit on the Jefferson National Forest in Virginia (from which we had specific NVUM data). The weighted average turned out to be 19.5 hours per site visit. 19.5 was divided by 12 (number of hours in an RVD) to get the value of 1.629 visits = to 1 RVD. This factor was multiplied by the 1989 price of an RVD. For example, Hunting had a 1989 price of $33.27. It was increased by a factor of 1.629 to equal $54.18. This price was then inflated by the Gross National Price Deflator to 2000 (a factor of 1.2887) to yield $71.22.

Table B-14 below displays the economic values that were used for each resource.

Table B-14: Economic Values for the NFs in Alabama

Economic Benefits and Financial Revenue Values	
Range ($/AUM)	
Cattle/Horses	$5.50
Timber *($/MCF)	
Saw-Soft	$1214
Saw-Hard	$302
Roundwood - Softwood	$218
Roundwood - Hardwood	$84
Minerals	
Dimension Stone ($/Metric Ton)	N/A
Crushed Stone ($/Metric Ton)	N/A
Limestone ($/Metric Ton)	N/A
Clay ($/Ton)	$.08
Petroleum ($/Barrel)	$6.50
Natural Gas ($/cubic meter)	N/A
Recreation ($/Visit)	
Camping, Picnicking, Swim.	$21.47
Mech. Travel, Viewing Scenery	$16.57
Winter Sports	$90.24
Resorts	$37.27
Wilderness (backpacking)	$45.67
Other Recreation	$132.67
Wildlife ($/Visit)	
Hunting	$71.22
Fishing	$141.43
Wildlife Watching	$84.88

* - Values for projected volumes from unsuited lands. Values for projected volumes from suited lands came from the Spectrum model.
N/A: Not Applicable

Stakeholder and Demographics Analyses

In recent years, the amount and level of conflict over natural resource issues have increased substantially. As a result, much attention has been devoted to increasing our understanding of the dynamics of these conflicts, what they mean for stakeholders and natural resource managers, and what can be done to help managers and stakeholders better understand each other and work together to find ways to resolve conflicts before they occur.

We attempted to learn of the values, attitudes, and beliefs of the neighbors to the Southern Appalachian forests through a random telephone survey. This survey was published under the title "Public Survey Report, Public Use and Preferred Objectives for Southern Appalachian National Forests", Cordell, K, et.al., June 2002. Copies are located at www.srs.fs.fed.us/trends.

TABLE B-15: County and State Population Characteristics of Counties with National Forest Land, 1980

	1980				
	Persons	White	Black	Other Race	% Minority
State of Alabama	3,894,000	2,872,600	996,340	58,231	27.1%
Bibb	15,723	12,029	3,675	195	24.6%
Calhoun	119,760	97,313	21,074	2,703	19.9%
Cherokee	18,760	17,185	1,550	125	8.9%
Chilton	30,612	26,942	3,633	204	12.5%
Clay	13,703	11,424	2,268	105	17.3%
Cleburne	12,595	11,925	647	94	5.9%
Covington	36,850	31,918	4,835	355	14.1%
Dallas	53,981	24,205	29,488	882	56.3%
Escambia	38,440	26,056	11,376	1,288	32.9%
Franklin	28,350	26,991	1,301	241	5.4%
Hale	15,604	5,774	9,799	339	65.0%
Lawrence	30,170	25,013	5,074	273	17.7%
Macon	26,829	4,034	22,579	561	86.2%
Perry	15,012	5,971	9,019	193	61.4%
Talladega	73,826	50,922	22,745	755	31.8%
Tuscaloosa	137,540	99,335	37,405	2,018	28.7%
Winston	21,953	21,818	69	188	1.2%
FOREST COUNTY TOTAL	813,347	584,268	223,845	12,683	29.1%
FOREST COUNTY AVERAGE	42,808	30,751	11,781	668	29.1%

Source: U.S. Bureau of Census.

TABLE B-16: County and State Population Characteristics of Counties with National Forest Land, 1990

	1990				
	Persons	White	Black	Other Race	% Minority
State of Alabama	4,040,600	2,975,200	1,019,700	45,597	26.4%
Bibb	16,576	13,080	3,492	4	21.1%
Calhoun	116,030	92,902	21,650	1,482	19.9%
Cherokee	19,543	18,204	1,277	62	6.9%
Chilton	32,458	28,709	3,658	91	11.6%
Clay	13,252	11,048	2,166	38	16.6%
Cleburne	12,730	12,068	601	61	5.2%
Covington	36,478	31,496	4,788	194	13.7%
Dallas	48,130	20,146	27,848	136	58.1%
Escambia	35,518	24,348	9,989	1,181	31.4%
Franklin	27,814	26,405	1,271	138	5.1%
Hale	15,498	6,250	9,190	58	59.7%
Lawrence	31,513	24,596	4,788	2,129	21.9%
Macon	24,928	3,425	21,421	82	86.3%
Perry	12,759	4,469	8,192	98	65.0%
Talladega	74,107	50,911	22,817	379	31.3%
Tuscaloosa	150,520	109,770	39,046	1,710	27.1%
Winston	22,053	21,935	53	65	0.5%
FOREST COUNTY TOTAL	823,913	593,152	220,781	9,990	28.0%
FOREST COUNTY AVERAGE	43,364	31,219	11,620	526	28.0%

Source: U.S. Bureau of Census.

TABLE B-17: County and State Population Characteristics of Counties with National Forest Land, 2000					
	2000				
	Persons	White	Black	Other Race	% Minority
State of Alabama	4,040,600	2,975,200	1,019,700	45,597	28.9%
Calhoun	16,576	13,080	3,492	4	23.3%
Cherokee	116,030	92,902	21,650	1,482	21.1%
Chilton	19,543	18,204	1,277	62	7.2%
Clay	13,252	11,048	2,166	38	17.4%
Cleburne	12,730	12,068	601	61	5.3%
Covington	36,478	31,496	4,788	194	13.8%
Dallas	48,130	20,146	27,848	136	64.4%
Escambia	35,518	24,348	9,989	1,181	35.6%
Franklin	27,814	26,405	1,271	138	10.3%
Hale	15,498	6,250	9,190	58	60.2%
Lawrence	31,513	24,596	4,788	2,129	22.2%
Macon	24,928	3,425	21,421	82	86.0%
Perry	12,759	4,469	8,192	98	69.1%
Talladega	74,107	50,911	22,817	379	33.0%
Tuscaloosa	150,520	109,770	39,046	1,710	31.9%
Winston	22,053	21,935	53	65	2.7%
FOREST COUNTY TOTAL	1,171,370	819,596	337,391	14,398	30.4%
FOREST COUNTY AVERAGE	61,651	43,137	17,757	758	30.4%

Source: U.S. Bureau of Census

TABLE B-18: Percent Change 1980–2000				
	% Change 1980–1990		% Change 1990–00	
	Population	Minority Population	Population	Minority Population
State of Alabama	3.8%	1.0%	10.10%	20.6%
Calhoun	5.4%	-9.7%	25.6%	39.0%
Cherokee	-3.1%	-2.7%	-3.3%	2.5%
Chilton	4.2%	-20.1%	22.7%	28.5%
Clay	6.0%	-2.3%	7.6%	12.4%
Cleburne	-3.3%	-7.1%	10.9%	12.2%
Covington	1.1%	-10.7%	3.2%	4.3%
Dallas	-1.0%	-4.0%	-3.7%	6.7%
Escambia	-10.8%	-7.9%	8.2%	22.5%
Franklin	-7.6%	-11.8%	12.3%	128.7%
Hale	-1.9%	-8.6%	10.9%	11.8%
Lawrence	-0.7%	-8.8%	10.4%	11.8%
Macon	14.2%	10.0%	-3.3%	-3.5%
Perry	-7.1%	-7.1%	-7%	-1.1%
Talladega	-1.0%	-4.6%	8.4%	14.2%
Tuscaloosa	0.4%	-1.3%	9.5%	29.0%
Winston	9.4%	3.4%	12.7%	464.4%
FOREST COUNTY TOTAL	1.3%	-2.4%	7.8%	13.8%
FOREST COUNTY AVERAGE	1.3%	-2.4%	10.10%	35.2%

Source: U.S. Bureau of Census

TABLE B-19: County and State Population Characteristics of Counties with National Forest Land, 1980, 1990, and 2000						
	Area in Sq. Miles	Population Density				
		1980	1990	1980–90	2000	1990–00
		Person/ Sq. Mi.	Person/ Sq. Mi.	% of Change	Person/ Sq. Mi.	% of Change
State of Alabama	50,750	76.7	79.6	3.8%	87.6	9.1%
Bibb	622	25.3	26.6	5.4%	33.4	20.4%
Calhoun	609	196.7	190.5	-3.1%	184.5	-3.3%
Cherokee	553	33.9	35.3	4.2%	43.4	18.7%
Chilton	594	51.5	54.6	6.0%	23.6	-98.3%
Clay	605	22.6	21.9	-3.3%	25.2	13.1%
Cleburne	560	22.5	22.7	1.1%	36.4	37.6%
Covington	1035	35.6	35.2	-1.0%	47.3	25.6%
Dallas	981	55.0	49.1	-10.8%	40.6	-20.9%
Escambia	947	40.6	37.5	-7.6%	49.1	23.6%
Franklin	636	44.6	43.7	-1.9%	26.7	-63.7%
Hale	644	24.2	24.1	-0.7%	29	16.9%
Lawrence	693	43.5	45.5	4.5%	50.2	9.4%
Macon	611	43.9	40.8	-7.1%	39.5	-3.3%
Perry	720	20.9	17.7	-15.0%	16.5	-7.3%
Talladega	740	99.8	100.1	0.4%	108.6	7.8%
Tuscaloosa	1325	103.8	113.6	9.4%	124.5	8.8%
Winston	614	35.8	35.9	0.5%	40.4	11.1%
FOREST COUNTY TOTAL	12,489	55.2	55.2	0.0%	54.1	3.5%
FOREST COUNTY AVERAGE	657	NA	NA	NA	N/A	N/A

N/A = Not Applicable or Not Available
Source: U.S. Bureau of Census.

TABLE B-20: County and State Population Characteristics of Counties with National Forest Land, 1980 and 1990 (Urban/Rural)						
	1980			1990		
	Urban	**Rural**	**% Rural**	**Urban**	**Rural**	**% Rural**
State of Alabama	2,337,700	1,556,200	40.0%	2439549	1601038	39.6%
Bibb	5,366	10,357	65.9%	5284	11292	68.1%
Calhoun	90,459	29,302	24.5%	82810	33224	28.6%
Cherokee	0	18,760	100.0%	2895	16648	85.2%
Chilton	5,832	24,780	80.9%	7669	24789	76.4%
Clay	0	13,703	100.0%	0	13252	100.0%
Cleburne	3,014	9,581	76.1%	2906	9824	77.2%
Covington	17,619	19,231	52.2%	16177	20301	55.7%
Dallas	31,939	22,042	40.8%	27578	20552	42.7%
Escambia	18,481	19,959	51.9%	16510	19008	53.5%
Franklin	11,427	16,923	59.7%	11263	16551	100.0%
Hale	3,248	12,356	79.2%	3047	12451	80.3%
Lawrence	3,197	26,973	89.4%	3248	28265	89.7%
Macon	13,327	13,502	50.3%	12257	12671	50.8%
Perry	4,467	10,545	70.2%	4211	8548	67.0%
Talladega	37,396	36,430	49.3%	39275	34832	47.0%
Tuscaloosai	99,554	37,987	27.6%	106428	44094	29.3%
Winston	5,306	16,647	75.8%	4399	17654	80.1%
FOREST COUNTY TOTAL	350,632	339,078	49.2%	345,957	343,956	49.9%
FOREST COUNTY AVERAGE	18,454	17,846	49.2%	18,208	18,103	49.9%

Source: U.S. Bureau of Census.

TABLE B-21: County and State Unemployment/Income in Counties with National Forest Lands, 1980 and 1990								
	1980			1990			Real Average Annual Income	
	Unemployment %	Per Capita Income	Median Income	Unemployment %	Per Capita Income	Median Income	% Change 1980–90 Per Capita Income	% Change 1980–90 Median Income
State of Alabama	8.8	$5,892	$16,347	7.0	$11,486	$28,688	2.1%	1.0%
Bibb	15.8	$4,859	$14,709	8.4	$8,973	$23,714	1.5%	0.1%
Calhoun	9.5	$5,596	$16,131	7.0	$10,704	$28,340	1.9%	1.0%
Cherokee	5.6	$5,436	$14,036	8.2	$9,915	$24,932	1.4%	1.1%
Chilton	13.3	$5,153	$14,206	8.2	$9,826	$26,203	1.8%	1.5%
Clay	7.5	$4,579	$13,360	7.2	$9,533	$24,145	2.7%	1.3%
Cleburne	6.7	$5,013	$14,642	6.1	$9,876	$25,900	2.2%	1.1%
Covington	7.6	$5,186	$13,791	7.1	$9,315	$23,257	1.2%	0.6%
Dallas	10.8	$4,654	$12,817	12.0	$8,344	$20,517	1.2%	0.1%
Escambia	8.6	$5,034	$14,113	9.4	$8,858	$22,858	1.0%	0.2%
Franklin	12.5	$5,454	$14,728	10.9	$9,049	$22,755	0.4%	-0.3%
Hale	14.5	$3,735	$10,368	7.6	$8,164	$18,272	3.2%	1.0%
Lawrence	12.4	$4,804	$14,689	11.5	$9,800	$25,478	2.5%	0.9%
Macon	8.8	$4,046	$11,454	7.0	$7,534	$20,096	1.6%	1.0%
Perry	8.0	$3,562	$9,983	10.8	$6,879	$16,404	2.0%	0.3%
Talladega	11.6	$4,981	$14,806	10.2	$9,700	$25,225	2.0%	0.7%
Tuscaloosa	8.5	$5,684	$17,166	5.1	$11,406	$30,135	2.4%	1.0%
Winston	14.0	$5,219	$13,793	10.8	$9,349	$22,023	1.2%	0.0%
FOREST COUNTY TOTAL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FOREST COUNTY AVERAGE	9.2	$4,368	$12,357	7.8	$8,275	$21,066	1.8	0.7

N/A = Not Applicable or Not Available
Source: U.S. Bureau of Census.

TABLE B-22: People of All Ages in Poverty, 1989 and 1995				
	1989 Percentage		1995 Percentage	
	Estimate	90% Confidence Interval	Estimate	90% Confidence Interval
State of Alabama	18.3	18.2 to 18.4	17.6	17.0 to 18.3
Bibb	21.2	19.4 to 23.0	18.1	14.5 to 21.7
Calhoun	15.7	15.0 to 16.3	17.5	14.2 to 20.8
Cherokee	17.6	16.1 to 19.1	15.8	12.6 to 19.1
Chilton	17.1	16.0 to 18.3	17.5	14.0 to 20.9
Clay	17.4	15.6 to 19.3	14.7	11.8 to 17.6
Cleburne	15.3	13.5 to 17.1	15.3	12.3 to 18.4
Covington	22	20.8 to 23.2	20.9	16.8 to 25.0
Dallas	36.2	34.9 to 37.6	33.8	27.3 to 40.3
Escambia	28.1	26.7 to 29.4	23.8	19.1 to 28.5
Franklin	20.7	19.4 to 22.1	17	13.6 to 20.4
Hale	35.6	33.5 to 37.8	30.8	24.6 to 37.0
Lawrence	19.8	18.6 to 21.1	16.6	13.3 to 19.8
Macon	24.9	23.9 to 25.8	17.8	14.1 to 21.4
Perry	34.5	32.5 to 36.5	34.4	27.4 to 41.4
Talladega	42.6	40.1 to 45.2	41.3	32.9 to 49.8
Tuscaloosa	20.4	19.2 to 21.5	19.4	15.6 to 23.2
Winston	20.2	19.2 to 21.1	20.7	16.6 to 24.7
SIMPLE AVERAGE	20.1		18.4	

Source: U.S. Bureau of Census, Small Area Income and Poverty Estimates Program.

TABLE B-23: Household Data, 1980 and 1990					
	65+ Households % Change	Persons per Household		% of All Households Female	
	1980–90	1980	1990	1980	1990
State of Alabama	17.5%	2.84	2.62	6.5%	7.1%
Bibb	2.4%	3.02	2.84	4.7%	5.4%
Calhoun	22.4%	2.82	2.59	5.7%	5.6%
Cherokee	24.4%	2.87	2.61	3.5%	3.7%
Chilton	13.3%	2.83	2.66	3.6%	3.8%
Clay	1.9%	2.87	2.62	0.6%	1.0%
Cleburne	7.5%	2.87	2.65	4.4%	3.4%
Covington	7.1%	2.65	2.5	4.6%	5.3%
Dallas	-0.4%	3.02	2.77	11.8%	14.3%
Escambia	5.6%	2.91	2.65	7.0%	7.7%
Franklin	11.0%	2.75	2.53	4.1%	4.6%
Hale	0.8%	3.18	2.82	9.5%	11.2%
Lawrence	16.0%	3.06	2.75	4.7%	5.8%
Macon	5.4%	2.93	2.67	12.0%	14.7%
Perry	-12.4%	3.14	2.89	8.3%	12.1%
Talladega	15.0%	3	2.71	6.4%	7.9%
Tuscaloosa	25.6%	2.74	2.55	6.9%	7.0%
Winston	24.8%	2.82	2.55	3.6%	4.3%
NFS IN ALABAMA TOTAL	13.3%			6.3%	7.0%
NFS IN ALABAMA AVERAGE	24.3%	2.80	2.50	4.2%	4.5%

Source: U.S. Bureau of Census.

TABLE B-24: Housing Data, 1980, 1990, and 2000								
	Total Housing Units						Housing Units	
	1980	1990	2000	% of Change			Median Value	
				1970–80	1980–90	1990-00	1980	1990
State of Alabama	1,120,239	1,467,427	1,670,379	31.0%	13.8%	13.8%	$33,900	$53,700
Bibb	4,476	5,759	6,404	28.7%	11.2%	11.2%	$22,500	$39,500
Calhoun	32,563	42,582	46,753	30.8%	9.8%	9.8%	$31,500	$51,600
Cherokee	5,452	8,197	9,379	50.3%	14.4%	14.4%	$27,500	$44,700
Chilton	9,106	12,869	13,883	41.3%	7.9%	7.9%	$27,700	$42,800
Clay	4,336	5,328	5,608	22.9%	5.3%	5.3%	$23,000	$35,500
Cleburne	3,634	4,798	5,232	32.0%	9.0%	9.0%	$25,100	$42,600
Covington	12,479	15,213	16,178	21.9%	6.3%	6.3%	$22,200	$34,800
Dallas	16,799	19,355	19,045	15.2%	-1.6%	-1.6%	$29,000	$43,800
Escambia	10,817	13,557	14,356	25.3%	5.9%	5.9%	$25,500	$41,100
Franklin	8,363	11,239	11,772	34.4%	4.7%	4.7%	$27,600	$38,300
Hale	4,849	5,568	6,370	14.8%	14.4%	14.4%	$21,200	$34,900
Lawrence	8,516	10,966	12,212	28.8%	11.4%	11.4%	$28,400	$44,300
Macon	7,079	9,230	9,818	30.4%	6.4%	6.4%	$27,800	$43,400
Perry	4,644	5,022	4,807	8.1%	-4.3%	-4.3%	$21,200	$31,600
Talladega	20,490	26,059	29,861	27.2%	14.6%	14.6%	$26,700	$44,800
Tuscaloosa	35,518	50,319	58,740	41.7%	16.7%	16.7%	$37,900	$62,100
Winston	6,041	8,697	10,254	44.0%	17.9%	17.9%	$25,300	$37,700
NFS IN ALABAMA TOTAL	195,162	254,758	280,672	30.5%	10.2%	10.2%		
NFS IN ALABAMA AVERAGE	10,272	13,408	14,772	30.5%	10.2%	10.2%	$23,689	$37,553

Source: U.S. Bureau of Census.

TABLE B-25: Personal Income and Transfer Payments, 1990 and 1997						
	Per Capita Personal Income			Per Capita Government Transfer Payment		
			% of Change			
	1990	1997	1990–97	1990	1997	1990–97
State of Alabama	$15,213	$20,672	4.50%	$2,706	$4,247	6.70%
Bibb	$12,285	$16,988	4.70%	$2,661	$4,145	6.50%
Calhoun	$13,815	$18,855	4.50%	$2,968	$4,837	7.20%
Cherokee	$12,172	$15,832	3.80%	$2,354	$3,779	7.00%
Chilton	$12,619	$17,825	5.10%	$2,461	$3,858	6.60%
Clay	$13,117	$18,822	5.30%	$2,631	$4,591	8.30%
Cleburne	$13,434	$17,049	3.50%	$2,379	$3,608	6.10%
Covington	$12,728	$17,547	4.70%	$3,125	$5,034	7.00%
Dallas	$12,034	$16,730	4.80%	$3,167	$5,156	7.20%
Escambia	$12,298	$16,680	4.50%	$2,559	$4,144	7.10%
Franklin	$12,621	$17,775	5.00%	$2,926	$4,566	6.60%
Hale	$10,743	$15,151	5.00%	$2,941	$4,677	6.90%
Lawrence	$12,294	$17,482	5.20%	$2,068	$3,384	7.30%
Macon	$10,185	$14,324	5.00%	$3,174	$5,145	7.10%
Perry	$9,657	$13,458	4.90%	$3,155	$5,406	8.00%
Talladega	$12,510	$16,857	4.40%	$2,795	$4,556	7.20%
Tuscaloosa	$15,006	$20,514	4.60%	$2,597	$4,140	6.90%
Winston	$12,304	$18,696	6.20%	$2,770	$4,775	8.10%
NFS IN ALABAMA AVERAGE	$12,441	$17,128	4.1%	$2,705	$4,370	7.1%

NOTE: Dollars are in nominal terms (year of occurrence).
Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System database.

TABLE B-26: County Unemployment Rates, 1997	
	Unemployment Rate 1997 (f/d) %
State of Alabama	5.4
Bibb	7.6
Calhoun	5.6
Cherokee	4.1
Chilton	5.0
Clay	4.7
Cleburne	3.6
Covington	6.8
Dallas	11.2
Escambia	6.7
Franklin	8.6
Hale	7.9
Lawrence	6.7
Macon	8.3
Perry	10.3
Talladega	6.9
Tuscaloosa	3.4
Winston	7.5
COUNTY TOTAL	5.7
COUNTY AVERAGE	5.1

Source: U.S. Bureau of Labor Statistics Local Area Unemployment.

TABLE B-27: Diversity of the NFs in Alabama Analysis Area's Economy by Major Industry Sector, 1985 and 1996

Industry	Industry Output	% of Output Total	Industry Output	% of Output Total	Employ ment	% of Total	Employ ment	% of Total	Total Income	% of Total	Total Income	% of Total
	1985*		1996*		1985		1996		1985		1996	
Agriculture	$1,417.9	7.0	$871.0	2.9	16,693	5.6	15,848	3.9	$487.8	5.5	$373.1	2.6
Mining	$522.9	2.9	$645.0	2.1	4,018	1.3	3,239	0.8	$251.7	2.8	$294.3	2.0
Construction	$857.6	4.8	$2,063.5	6.8	14,358	4.8	26,959	6.7	$337.6	3.8	$732.1	5.1
Wood Products Manufacturing												
Mfg.—SIC 24 Lumber & Wood Prods.	$570.3	3.2	$1,740.6	5.7	9,196	3.1	14,606	3.6	$181.5	2.0	$617.5	4.3
Mfg.—SIC 25 Wood Furniture & Fixtures	$124.4	0.7	$244.7	0.8	2,784	0.9	2,598	0.6	$43.9	0.5	$73.9	0.5
Mfg.—SIC 26 Paper & Pulp Products	$962.5	5.4	$1,822.9	6.0	5,908	2.0	6,478	1.6	$329.8	3.7	$627.2	4.4
Other Manufacturing	$5,064.4	28.3	$8,981.6	29.4	59,903	20.0	59,375	14.7	$1,591.4	17.8	$2,540.7	17.7
Total Manufacturing	$9,519.9	37.5		41.9		26.0	69,727	20.6	$	24.0	$3,859.3	26.9
Recreation Related Services												
Recreational Related Wholesale	$6.4	0.0		0.0	127	0.0		0.0	$3.2	0.0	$0.0	0.0
Recreational Related Retail Trade	$14.6	0.1		0.0	444	0.1		0.0	$7.7	0.1	$0.0	0.0
Local, Interurban Passenger Transit	$1.5	0.0	$18.8	0.0	47	0.0	633	0.1	$0.7	0.0	$11.9	0.0
Other Recreation Related Industries												
Air Transportation	$11.2	0.0	$71.4	0.0	122	0.0	795	0.0	$4.2	0.0	$33.1	0.0
Wholesale & Retail Trade	$1,572.1	0.4	$1,548.4	0.3	36,910	0.6	27,965	0.3	$839.1	0.5	$886.4	0.3
General Merchandise Stores		0.0	$252.0	0.0		0.0	9,066	0.1	$0.0	0.0	$148.6	0.1
Food Stores		0.0	$295.6	0.0		0.0	11,222	0.1	$0.0	0.0	$205.4	0.1
Eating & Drinking	$390.7	0.3	$606.4	0.3	11,112	0.6	19,948	0.7	$125.0	0.2	$244.7	0.3
Miscellaneous Retail		0.0	$325.1	0.1		0.0	12,571	0.2	$0.0	0.0	$220.0	0.0
Hotels & Lodging Places	$49.1	0.1	$93.5	0.1	1,720	0.2	2,525	0.2	$25.5	0.1	$38.7	0.1
Laundry, Cleaning & Shoe Repair	$46.8	0.0	$76.8	0.0	2,230	0.1	3,605	0.1	$29.0	0.0	$50.0	0.1
Automobile Rental & Leasing	$35.9	0.0	$24.1	0.0	441	0.0	264	0.0	$14.3	0.0	$11.8	0.0
Automobile Repair & Services	$121.1	0.1	$263.7	0.1	1,994	0.1	3,737	0.1	$51.0	0.1	$108.8	0.1
Amusement & Recreation Services, N.E.C.	$5.0	0.0	$43.2	0.1	272	0.0	1,657	0.1	$2.6	0.0	$21.6	0.0
Total Tourism Estimate	$2,254.6	1.1	$3,619.0	1.0	55,419	1.8		2.1	$1,102.1	1.0		
Transportation & Utilities—Non-Tourism	$1,065.2	6.0	$1,897.5	6.5	10,481	3.5	12,522	3.4	$547.1	6.2	$903.0	6.6
Finance, Insurance, Real Estate	$826.1	4.6	$2,382.6	7.8	11,443	3.8	12,898	3.2	$498.5	5.6	$1,467.6	10.2
Services—Non-Tourism	$1,204.1	7.9	$2,872.7	10.7	32,261	12.6	65,665	18.6	$769.1	9.7	$1,620.4	12.6
Wholesale & Retail Trade—Non-Tourism		10.2		9.2		14.9		18.5		10.1		111.1
Government	$2,977.8	16.6	$3,380.5	11.1	70,543	23.6	84,964	21.0	$2,736.5	30.6	$3,109.2	21.6
Other—Miscellaneous	$71.7	0.4	$22.8	0.1	6,341	2.1	4,514	1.1	$71.7	0.8	$22.8	0.2
Total	$27,439.3	100.0	$30,544.3	100.0	299,348	100.0	403,653	100.0	$8,948.7	100.0	$14,362.9	100.0

Source: USDA IMPLAN
*Dollars in Millions
Percentages may not equal 100% because of rounding
Source: 1985 and 1996 IMPLAN Data.

TABLE B-28: Net Exports, 1985 and 1996

	Net Exports—Exports Less Imports		Net Exporting Industries as a Percentage of Total Positive Exporting Industries	
Commodity	1985	1996	1985	1996
Agriculture	$693.0	$79.6	27.2	4.6
Mining	$10.6	-$5.0	0.4	0.0
Construction	-$235.3	-$58.1	0.0	0.0
Other Manufacturing	-$843.0	-$140.5	0.0	0.0
Mfg.—SIC 24 Lumber & Wood Prods.	$262.4	$513.3	10.3	30.0
Mfg.—SIC 25 Wood Furniture & Fixtures	$53.9	$71.8	2.1	4.2
Mfg.—SIC 26 Paper & Pulp Products	$502.4	$1,000.4	19.7	58.4
Total Manufacturing	-$24.3	$1,445.0	0.0	84.3
Existing in Tourism Estimate:				0.0
Transportation & Utilities	-$280.4	-$515.5	0.0	0.0
Local, Interurban Passenger Transit	-$3.1	-$30.3	0.0	0.0
Air Transportation	-$157.8	-$127.3	0.0	0.0
Wholesale & Retail Trade—Non-Tourism	-$516.5	-$922.1	0.0	0.0
Recreation Related Wholesale Trade	-$5.1		0.0	0.0
Recreation Related Retail Trade	-$13.8		0.0	0.0
General Merchandise Stores		-$59.4	0.0	0.0
Food Stores		-$102.5	0.0	0.0
Eating & Drinking	-$53.0	-$80.0	0.0	0.0
Miscellaneous Retail		-$93.4	0.0	0.0
Finance, Insurance, and Real Estate	-$1,588.2	-$2,110.2	0.0	0.0
Hotels and Lodging Places	-$55.9	-$160.2	0.0	0.0
Laundry, Cleaning, and Shoe Repair	$2.4	$9.5	0.1	0.6
Services—Non-Tourism	-$1,102.6	-$2,074.5	0.0	0.0
Automobile Rental and Leasing	-$27.8	-$72.5	0.0	0.0
Automobile Repair and Services	-$32.1	$39.3	0.0	2.3
Amusement and Recreation Services, N.E.C.	-$75.4	-$72.0	0.0	0.0
Total for Commodities in Tourism Estimate (ex, 433, 447, 456, 465)	-$421.8	-$748.8	0.0	0.0
Commodities for 433, 447, 456, 465	-$3,487.7	-$5,622.4	0.0	0.0
Estimate of Trade in Tourism Estimate**	-$38.4	-$64.4	0.0	0.0
Government	$1,021.2	-$40.1	40.1	0.0
Other—Miscellaneous	-$136.4	-$131.5	0.0	0.0
TOTAL NET TRADE (EXPORTS)	-$2,580.6	-$5,081.3	100.0	100.0
TOTAL POSITIVE TRADE INDUSTRIES (EXPORTS)	$2,545.9	$1,713.8		

Source: 1985 and 1996 IMPLAN Data.

NOTE: 1996 IMPLAN did not have Recreation Related Wholesale and Retail Trade.

TABLE B-29: Payment in Lieu of Taxes Payments to Counties, 1990 and 1999			
	Payments		% of Change
	1990	1999	1990–99
State of Alabama	$116,990	*	*
Bibb	$6,081	$27,528	352.7%
Calhoun	$2,374	$10,759	353.2%
Cherokee	$11	$8,030	72900.0%
Chilton	$2,283	$10,468	358.5%
Clay	$6,363	$29,244	359.6%
Cleburne	$8,971	$43,604	386.1%
Covington	$5,383	$5,380	-0.1%
Dallas	$274	$1,065	288.7%
Escambia	$2,905	$2,850	-1.9%
Franklin	$123	$640	420.3%
Hale	$3,059	$14,583	376.7%
Lawrence	$8,973	$47,137	425.3%
Lee	$3	$0	-100.0%
Macon	$1,109	$8,340	652.0%
Perry	$3,211	$14,844	362.3%
Russell	$1,416	$1,565	10.5%
Talladega	$4,440	$20,840	369.4%
Tuscaloosa	$1,323	$6,889	420.7%
Winston	$8,870	$46,367	422.7%
FOREST COUNTY TOTAL	$67,172	$300,133	346.8%
FOREST COUNTY TOTAL AS % OF STATE TOTAL	57.4%	79.1%	

Source: U.S. Bureau of Land Management.

TABLE B-30: 25 Percent Payments by County with National Forest Lands, 1986, 1989, 1992, 1995, 1997

Counties within National Forest Boundary	1986	1989	1992	1995	1997	% of Change 1986–97
Bibb	$198,364.27	$118,904.03	$133,690.93	$136,391.17	$86,667.62	-56.3%
Calhoun	$65,844.67	$45,895.67	$51,977.58	$53,103.51	$33,700.42	-48.8%
Cherokee	$0.00	$0.00	$3,413.35	$5,104.94	$3,239.69	6.0%
Chilton	$75,218.10	$44,640.34	$50,273.11	$51,452.11	$32,883.72	-56.3%
Clay	$217,186.91	$124,187.35	$140,559.46	$143,604.23	$91,592.11	-57.8%
Cleburne	$284,260.50	$174,895.10	$206,707.94	$214,848.37	$137,033.35	-51.8%
Covington	$322,159.47	$258,574.22	$188,090.93	$184,030.21	$136,481.90	-57.6%
Dallas	$7,294.48	$4,329.12	$4,875.59	$4,981.20	$3,019.81	-58.6%
Escambia	$173,348.97	$139,542.27	$101,623.53	$98,541.89	$73,084.07	-57.8%
Franklin	$3,072.96	$2,282.58	$4,764.72	$1,739.45	$1,351.20	-56.0%
Hale	$93,566.31	$55,529.61	$62,539.14	$63,891.60	$40,546.74	-56.7%
Lawrence	$173,783.11	$166,922.37	$349,684.96	$128,058.53	$99,475.17	-42.8%
Macon	$13,759.53	$133,053.90	$46,144.59	$58,390.37	$344.60	-97.5%
Perry	$105,783.07	$62,778.05	$71,768.39	$73,482.76	$46,633.46	-55.9%
Talladega	$150,581.17	$86,856.06	$98,123.84	$100,384.37	$65,169.19	-56.7%
Tuscaloosa	$28,327.87	$20,423.49	$23,001.55	$23,949.78	$15,198.96	-46.3%
Winston	$174,743.40	$165,004.40	$344,741.61	$126,201.42	$97,997.34	-43.9%
FOREST COUNTY TOTAL	$2,087,294.79	$1,603,818.56	$1,881,981.22	$1,468,155.91	$964,419.35	-53.8%

Source: USDA Forest Service, Rocky Mountain Research Station.

TABLE B-31: Land-Use Percent, 1982 and 1992									
Counties within National Forest Boundary	Acres	% Share							
		Forest		Farm		Urban		Residual	
		1982	1992	1982	1992	1982	1992	1982	1992
Bibb	1,647,230,000	7.3%	6.9%	72.7%	73.6%	1.3%	1.5%	18.8%	18.1%
Calhoun	1,555,960,000	17.5%	15.5%	50.5%	49.1%	6.2%	7.8%	25.8%	27.6%
Cherokee	1,570,740,000	32.9%	33.0%	58.8%	58.1%	2.2%	2.9%	6.1%	6.0%
Chilton	1,844,630,000	18.1%	17.8%	70.1%	69.9%	1.9%	2.4%	9.9%	9.9%
Clay	1,560,540,000	9.6%	9.0%	68.3%	69.3%	1.2%	1.5%	21.0%	20.2%
Cleburne	1,455,310,000	7.8%	8.1%	65.1%	60.6%	0.8%	1.0%	26.4%	30.4%
Covington	2,755,010,000	26.3%	15.2%	62.4%	62.5%	1.3%	1.8%	10.0%	20.6%
Dallas	2,532,100,000	42.9%	26.6%	50.4%	49.9%	1.8%	2.0%	4.9%	21.5%
Escambia	2,519,200,000	10.6%	10.5%	78.4%	78.0%	2.0%	2.3%	9.0%	9.2%
Franklin	1,622,300,000	28.4%	27.5%	57.9%	59.4%	1.2%	1.6%	12.6%	11.5%
Hale	1,733,400,000	35.6%	24.5%	54.1%	55.6%	1.1%	1.3%	9.2%	18.6%
Lawrence	1,864,000,000	44.4%	43.9%	27.9%	27.1%	1.8%	2.6%	25.9%	26.4%
Macon	1,605,760,000	28.2%	20.0%	62.8%	64.5%	1.2%	1.8%	7.9%	13.7%
Perry	1,881,900,000	36.9%	21.3%	52.9%	54.8%	0.3%	0.5%	9.9%	23.5%
Talladega	1,963,440,000	25.3%	22.2%	56.4%	57.8%	4.8%	5.8%	13.5%	14.3%
Tuscaloosa	3,530,120,000	7.4%	4.1%	82.3%	83.2%	3.5%	5.3%	6.9%	7.5%
Winston	1,654,290,000	10.4%	10.7%	57.3%	57.9%	1.5%	1.8%	30.8%	29.6%
ACRES WITHIN FOREST BOUNDARY	36,550,890,000								
WEIGHTED AVERAGE FOR FOREST		22.7%	18.0%	62.0%	62.2%	2.3%	3.1%	12.9%	16.7%

Source: Natural Resource Information System.

TABLE B-32: Shannon-Weaver Entropy Indicies		
Forest Boundary Counties	**1977 Four Digit SIC**	**1993 Four Digit SIC**
Bibb	0.46028	0.58143
Calhoun	0.41583	0.52260
Cherokee	0.48240	0.60011
Chilton	0.53889	0.63296
Clay	0.41583	0.52260
Cleburne	0.41015	0.54091
Covington	0.48452	0.61118
Dallas	0.53175	0.64781
Escambia	0.53727	0.62759
Franklin	0.51461	0.60722
Hale	0.49468	0.56240
Lawrence	0.47439	0.55965
Macon	0.27423	0.49794
Perry	0.50877	0.56986
Talladega	0.55777	0.63163
Tuscaloosa	0.56365	0.63447
Winston	0.51385	0.59049
ALABAMA	0.58649	0.72608
UNITED STATES	0.66483	0.73973

Source: USDA Forest Service, IM

The Sediment Model - Sediment Yields and Cumulative Effects for Water Quality and Associated Beneficial Uses.

Introduction

Six National Forests in the Southern Appalachians are in the process of revising their Land and Resource Management Plans. In May 2002 the regional office and forest steering team approved a process to meet the planning requirements (36 CFR.219.23) for effects analysis on aquatic resources. Of the six requirements most of the information is readily available to the forests. However, item (d) of the aquatic resources section requires that forest planning provide for an evaluation of existing or potential watershed conditions that will influence soil productivity, water yield, water pollution, or hazardous events.

In earlier planning efforts forests were directed to calculate sediment and water yield increases over time. This served as a surrogate of existing condition and provided a quantification of potential effects of alternatives. However, watershed condition was described in general physical terms, not in terms of health or vulnerability to management actions. With the current level of planning, available data layers, and GIS information there is an opportunity to specifically evaluate watershed condition and estimate the effects of management activities based on a number of watershed parameters. Sediment yield or an index of disturbance would still be used but the result would be directly related to overall watershed condition or health rather than just erosion potential. The following is a description of the process used to address Section (d) of the aquatic resources under 36 CFR, 219.23 planning rule (1982) and the associated cumulative effects for water quality and associated beneficial uses.

The purpose of this process is to estimate sediment yields and analyze the cumulative effects of proposed management actions on water quality. The process provides an objective process to systematically evaluate water quality conditions for watersheds covered in whole or part by forest plans. The process also provides results that can aid in aquatic viability analysis at the community scale.

The process builds upon the East-Wide Watershed Assessment Process, and provides for modifications based on local information. Interpretation of analysis results strives to describe objectives rather than “constraints” and provides the forests an opportunity to identify and focus on watersheds where there are “significant” opportunities to improve condition.

The Process

Current Watershed Condition

The first step in the process was to determine the current condition by watershed. In order to determine condition the following data layers were assimilated. Data layers from the individual forests include watershed boundaries, ATV trails, and forest alternatives developed in the planning process. Tiger census data was utilized for the roads layer EPA provided data for point sources, dams, NLCD (land use data), DEMs, and ecoregions. From this data a process similar to the Eastside Watershed Assessment Protocol was developed where watersheds were ranked on a relative scale. However, instead of creating a general ranking of 1 to (n), a simplified ranking of 1 through 5 for individual condition factors were valued based on natural breaks within ArcView 3.2a. This process would be repeated for each of the following parameters.

Layers	Use	Source	Unit
Watersheds	planning unit	from NRCS or USFS	5th level HUC
ownership/ alternatives	to determine the potential to affect of Forest Service ownership on viability of Species of Concern	from individual forests	percent
Streams	used to determine riparian areas	RF3 data from EPA Basins III	not applicable
Roads	road density and riparian road density	from tiger census data	miles per square mile
land use	determine watershed and riparian area land use	1970 GIRAS data from EPA Basins III, 1994 NLCD from EPA Region 4	percent
Dams	determine altered flow	from EPA Basins III	number per square mile
point sources	cerlis, ricris, and npdes sites	from EPA Basins III	number per square mile

The values for each layer were averaged to calculate a combined condition score for each metric where 1–1.5 = impaired, 1.51–2.5 = slightly impaired, 2.51–3.50 = average, 3.51–4.5 = above average, 4.51 – 5 = excellent. This allows for a determination of condition among the watersheds. However, it does not suggest that a watershed with a score of 4 is twice as good as a watershed of 2, only that the watershed with a value of 4 is above average and the watershed with a value of 2 is below average or slightly impaired. These metrics were developed to determine watershed condition for individual issues or concerns.

The metrics and combinations of data used to determine the metrics are outlined in the following list:

1) Sedimentation was assessed separately by the determining the percent increase above the baseline sediment levels by watershed as assessed with the Watershed Health Index (WHI). This process is described in detail later in this paper.

2) Point Source Pollutants (density of point sources).

3) Temperature (road density in the riparian area, and percent forest (1970's and 1990's) in the riparian area).

4) Altered stream flow (density of dams, road density in the riparian, and average density of strip-mines (1970's and 1990's).

The results of this exercise were used in the Aquatic Viability assessment. Sediment was additionally used to determine the cumulative effects on water quality and associated beneficial uses.

Cumulative Effects

The analysis of cumulative impacts is a requirement of the National Environmental Policy Act (NEPA). A cumulative impact analysis should consider incremental impacts of actions when added to past, present, and reasonably foreseeable future actions. The analysis includes all actions regardless of who undertakes the actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

"A cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

Sediment is an appropriate measure to determine the effects of management activities on water quality and its associated beneficial uses on forested lands (Coats and Miller, 1981). Sediment increases can adversely affect fish productivity and diversity (Alexander and Hansen, 1986), degrade drinking water and affect recreational values. There may be other cumulative impacts such as increases in water yield as a result of harvesting methods. However, water yield models do not characterize the impacts of all management activities such as road construction and the increase in water yield is generally less than the natural variability. Changes in water nutrients or nutrient fluxes within streams as a result of management activities are minor and not an appropriate consideration of cumulative effects at the forest plan level. This model uses predicted sediment yields as the surrogate for determining cumulative impacts for water quality.

Changes in land use and disturbance are modeled with respect to estimated increases in sediment and predicted impacts are summarized by alternative. The significance of predicted impacts are related to criteria designed to determine levels of watershed health (WHI) as described in a following section of this paper.

Bounding the Effects Analysis

A valid cumulative effects analysis must be bounded in space and time. For the purposes of this exercise in forest planning, 5th level watersheds are the appropriate spatial bounds for cumulative effects. The implementation period for a forest plan is 5 to 15 years, however the appropriate time period captured for the sediment model is for 5 decades (50 years).

Modeling Sediment Yield

A detailed description of data sources and steps can be found in Data Sources and Manipulation. Following is a summary of the process:

Using the National Land use Classification Data (NLCD), Digital Elevation Models (DEM), and Ecoregions data layers, a determination of combinations of land use, slope class, and physiographic zone were made for 30-meter grids. These values were tabulated for each watershed including non-Forest Service lands. Results were used to identify estimated erosion values for entire watersheds.

Tiger Census Roads data, Forest Service ATV trails, and Ecoregions were used to determine road surface type, physiographic zone and length. This information was used to estimate sediment values for each watershed.

Using a combination of Early Forest Succession values (from Forest Service prescriptions), slope class, and physiographic zones, these values were tabulated for each watershed and alternative.

Forest Service personnel provided values for the following categories:

> The number of acres of prescribed fire planned by alternative and period (By alternative and physiographic zone),
>
> Miles of dozer fireline per acre burned,
>
> Miles of temporary and permanent road constructed per acre regenerated,
>
> Urban growth,
>
> The rotation period on other forested lands, and
>
> Other changes in land use activities or disturbances that individual forests felt were important such as oil and gas exploration, pasture conversion or strip mining.

Coefficients for erosion were taken from the average and high erosion rates found in Dissmeyer and Stump (1978) for the appropriate physiographic zone. Recovery rates were determined from studies on the Ouachita National Forest. These recovery rates were determined through field observations and provide a realistic recovery value for the Southeast and are appropriate for this level of analysis. It should be recognized that the high erosion rates would yield overestimations of erosion for most Forest Service activities and should be viewed as a worst-case scenario. The high rates were used to account for steep slopes and management practices on other lands that may not have the same standards as Forest Service lands.

Erosion values (from land use) were multiplied by a sediment delivery coefficient based on watershed size determined from Roehl (1962). Sediment values from roads are part of the WEPP calculation. WEPP only assumes that sediment values are delivered to the nearest channel. This model sums the total number of sediment tons from roads and calculates sediment from erosion delivered to the mouth of the watershed.

Road (by surface type), fireline, and ATV sediment values were determined from field surveys using the WEPP model to determine sediment values. These values were converted to coefficients by physiographic zone (Process to be described by later in this paper) and multiplied by the number of miles of road (by surface type), fireline or ATV trail.

All values were summarized in a spreadsheet by watershed for the baseline sediment yield and current sediment yield (Forest Service and private).

The values from SPECTRUM (Total number of acres per planning period by physiographic zone, early succession class and slope class) are placed in the sediment spreadsheet for each alternative and period.

In addition, the spreadsheet summarizes predicted management activities by watershed, alternative, and planning period. This allows for a discussion of past, present and future activities for public and private lands by watershed for a time period of 50 years.

Data Interpretation

The summary worksheet of the sediment model calculates the baseline, current, and predicted sediment values for each watershed by alternative and period. To determine the potential cumulative effects of water quality and associated beneficial uses these sediment values are expressed as a percent increase over the baseline. The baseline assumes an undisturbed forest floor with no roads. It should be recognized that using such a baseline will result in high percentage increases since baseline values can indicate little to no erosion or sediment. The percentage values are only used as a mathematical index and should not be viewed as an indication of effects or impairment. This becomes more clear when the interpretation of this information is captured in a value added process call the Watershed Health Index (WHI) as described below.

Watershed Health Index

Watershed Health Index (WHI) is a measure that characterizes the condition of 5th level watersheds with respect to current and future sediment load increases.

In order to establish WHIs, the current sediment average annual yield is determined and expressed as a percent above the baseline conditions. Baseline conditions are considered to be those conditions existing at the time of pre-European settlement in the analyzed watersheds. The initial watershed health index is determined by using the relative abundance of locally adapted species with respect to sediment increases. This score is modified by a weighted average where the watershed occurs in more than one physiographic zone. Health is generalized into three categories of excellent, average and below average.

These generalized categories are further refined from information determined from the East-Wide Watershed Assessment Process (EWAP). Factors taken from EWAP are percent National Forest ownership, percent of the riparian that is forested, and road density of the riparian. As an example, if the percent forested riparian is high and road density is low for a watershed then a watershed with a below average condition would be upgraded to average. This would indicate that, while a watershed may have a high percent increase of sediment, forested riparian areas are abundant enough to provide adequate habitat and protection for aquatic resources. EWAP results (high, medium and low) would be determined using natural breaks.

From the WHI a series of determinations can be made that determine or assign additional Forest Objectives. The following section details the outcome of the WHI with respect to adverse effects on aquatic biota as they are related to forest management:

Where a watershed WHI is *excellent*, the probability (or potential) is low for adverse effects to aquatic species. If the results of forest alternatives (from the sediment model) remain within this range there should be no adverse effect on water quality with respect to beneficial uses (fish communities).

Where a watershed WHI is *average,* the potential to adversely affect beneficial uses is dependent upon the additional factor of forest service ownership. Where forest service ownership is high or moderate the potential to adversely affect beneficial uses is moderate. Where Forest Service ownership is low the potential is not applicable. If the results of forest alternatives (from the sediment model) remain within the range of sediment increases established by the WHI there would likely be no additional adverse effect on water quality with respect to beneficial uses (fish communities).

Where a watershed with a WHI is *below average*, the potential to adversely affect beneficial uses is dependent upon the additional factor of forest service ownership. Where Forest Service ownership is high or moderate the potential to affect beneficial uses is likely respectively high or moderate. Where Forest Service ownership is low, the potential to affect beneficial uses is assumed to be not applicable.

Forest objectives are determined by the WHI and their related potentials for affecting beneficial uses. Watershed WHIs and their respective objectives are:

Excellent – Forest Service objectives would be to maintain or improve aquatic health through the implementation of Riparian prescriptions.

Average – Besides the objectives listed above, additional forest objectives should be considered. Examples of these additional objectives would be conducting watershed assessments during project planning to demonstrate the source of the problem, and monitoring prior to project implementation to determine actual health of the biota.

Below Average – In addition to objectives listed above, Forest objectives at the project level would seek to maintain or restore watershed health and aquatic systems where the Forest Service can make meaningful contributions to watershed health. Apply prescriptions in the revised forest plan to correct the unhealthy situation.

Not Applicable – Because of the low percentage of National Forest ownership it is unlikely that any additional combination of forest activities would have a measurable positive or negative effect.

Given the additional forest objectives above, the likelihood to maintain or improve the WHI is excellent where forest ownership is high or moderate and improbable where forest ownership is low. The results of the WHI and other information can also be used to develop partnerships with other landholders or managers to improve overall watershed condition and improve aquatic health. This is one advantage of analyzing entire watersheds. Not only can Forest Service activities and contributing effects be isolated but other watershed effects can be identified as well.

Local data

This process is designed at the physiographic scale and applied for 5^{th} level watersheds. Where local data exists at the 5^{th} watershed level it can be used to adjust the WHI. Data should include either population trends or aquatic habitat inventories commiserate with the 5^{th} level watershed scale.

Assumptions, uncertainties and limitations

Many assumptions are made throughout the sediment model and the WHI. Every effort has been made to describe those assumptions and minimize misrepresentation. With that in mind the application of the sediment model and associated WHI should not be taken as absolutes but as a method that can describe the effects from the range of alternatives and suggest where a greater risk with respect to water quality and aquatic biota exists. This process is developed for the forest plan level.

Following is an example of spreadsheet data and the WHI based on the current condition from the Jefferson National Forest.

Jefferson example

HUC	Percent increase over Baseline	Excellent Range - 0.0 to D	Average Range - D to E	WHI weighted ave[1]	Percent National Forest ownership	FS Ownership value [2]	WHI value adjusted by ownership [3]	Percent forested riparian area 1990	Percent Forest Riparian value [4]	Road density in the riparian area	Road Density value [4]	WHI adjustment (2 Gs = upgrade) [5]	Final WHI [3]
208020102	851.10	2,298	3,815	E	41.5	M	E	84.5	A	2.4	A	N/C	E
208020103	988.80	2,300	3,800	E	54.2	H	E	85.5	G	2.4	A	N/C	E
208020106	977.05	2,300	3,800	E	58.7	H	E	79.8	A	2.4	A	N/C	E
208020107	2,721.89	2,232	3,770	A	14.5	L	N/A	61.5	P	3.3	A	N/C	N/A
208020108	1,116.02	2,300	3,800	E	61.5	H	E	85.0	A	2.3	G	N/C	E
208020109	1,649.19	1,375	3,389	A	43.3	M	A	75.8	A	3.5	A	N/C	A
208020205	1,793.81	2,300	3,800	E	4.3	L	N/A	65.6	P	3.8	P	N/C	N/A
208020301	2,100.60	11,786	13,779	E	21.5	M	E	76.9	A	3.1	A	N/C	E
301010101	1,944.22	1,760	3,560	A	1.3	L	N/A	74.5	A	3.5	A	N/C	N/A
301010102	6,528.09	1,873	3,633	A	0.8	L	N/A	62.7	P	5.4	P	N/C	N/A
301010107	2,191.79	14,289	16,079	E	2.1	L	N/A	71.7	A	2.8	A	N/C	N/A
301010108	5,300.69	15,170	17,010	E	2.0	L	N/A	61.7	P	2.7	A	N/C	N/A
505000101	1,815.60	500	3,000	A	3.1	L	N/A	79.5	A	5.1	P	N/C	N/A
505000103	4,504.20	500	3,000	BA	2.5	L	N/A	59.7	P	4.0	P	N/C	N/A
505000104	3,295.61	567	3,064	BA	8.8	L	N/A	62.5	P	4.5	P	N/C	N/A
505000105	2,539.08	500	3,000	A	22.5	M	A	68.4	P	3.8	P	N/C	A
505000106	4,394.65	1,144	3,286	A	4.1	L	N/A	54.5	P	3.6	A	N/C	N/A
505000107	2,657.85	1,460	3,427	A	32.5	M	A	55.4	P	3.0	A	N/C	A
505000108	3,707.17	2,185	3,749	A	18.4	M	A	47.9	P	3.0	A	N/C	A
505000110	5,853.11	2,178	3,746	A	9.6	L	N/A	54.4	P	3.8	P	N/C	N/A
505000201	2,020.67	2,300	3,800	E	26.1	M	E	63.5	P	3.0	A	N/C	E

HUC	Percent increase over Baseline	Excellent Range - 0.0 to D	Average Range - D to E	WHI weighted ave[1]	Percent National Forest ownership	FS Ownership value [2]	WHI value adjusted by ownership [3]	Percent forested riparian area 1990	Percent Forest Riparian value [4]	Road density in the riparian area	Road Density value [4]	WHI adjustment (2 Gs = upgrade) [5]	Final WHI [3]
505000202	1,911.69	2,300	3,800	E	30.5	M	E	64.6	P	2.6	A	N/C	E
505000203	1,389.17	2,300	3,800	E	19.7	M	E	64.8	P	3.4	A	N/C	E
505000204	2,102.52	2,268	4,092	E	13.3	L	N/A	65.9	P	4.9	P	N/C	N/A
505000207	2,868.17	2,244	4,301	A	0.5	L	N/A	41.7	P	5.3	P	N/C	N/A
505000210	3,003.98	2,221	4,511	A	0.2	L	N/A	61.1	P	3.5	A	N/C	N/A
507020203	2,385.24	2,201	4,695	A	0.8	L	N/A	93.5	G	4.5	P	N/C	N/A
507020205	4,964.07	2,200	4,700	A	12.1	L	N/A	85.4	G	3.6	A	N/C	N/A
507020206	2,683.59	2,200	4,700	A	0.4	L	N/A	96.1	G	6.0	P	N/C	N/A
513010101	1,250.08	2,200	4,700	E	0.8	L	N/A	95.8	G	4.7	P	N/C	N/A
601010101	1,537.78	2,300	3,800	E	10.7	L	N/A	67.1	P	2.9	A	N/C	N/A
601010201	2,438.07	984	3,215	A	48.3	H	A	72.8	A	3.2	A	N/C	A
601010202	4,219.02	2,094	3,708	BA	14.3	L	N/A	47.9	P	4.4	P	N/C	N/A
601020504	4,312.77	2,232	4,411	A	18.0	M	A	79.2	A	4.2	P	N/C	A
601020505	1,484.91	2,288	3,912	E	9.1	L	N/A	72.6	A	4.2	P	N/C	N/A
601020601	4,211.55	2,221	4,512	A	9.4	L	N/A	76.8	A	4.9	P	N/C	N/A

[1] E=Excellent, A=Average, BA=Below Average;
[2] H=High, M=Medium, L=Low;
[3] E=Excellent, A=Average, BA=Below Average, N/A=Not Applicable;
[4] G=Good, A=Average, P=Poor;
[5] N/C=No Change, U=Upgrade.

Data Sources and Manipulation

Data calculations and summary were derived from numerous sources. The following discussion identifies ArcView data layers, the source of those data layers and how they were manipulated or queried. The first step in any data manipulation is to place the data in a common projection. The projection chosen was UTM zone 17, NAD 27, meters.

Layers requested from the Forests include:

Watersheds	Data were place in a common projection. Shared watersheds were assigned a common number when there were number conflicts.
ATV trails	Trails that were not utilized by ATVs, bikes, or horses were deleted. The remaining trials were intersected by watershed and ecoregions data layers. Miles were calculated and summed by watershed, and ecoregions.
Alternatives	The prescriptions from each alternative were matched with the Forest Early Succession value. This shapefiles were then converted to a 30-meter grid using the Forest Early Succession value. NonForest Service ownerships were deleted.

From the Tiger Census (1995):

Roads	Based on the CFCC data attribute road segments were assigned a road surface value of paved highway, paved local, gravel or native. These data were then intersected by watershed and ecoregion. Miles were calculated and summed by watershed, and ecoregion.

Land use and land cover factors were from:

NLCD (EPA R4) and Jefferson. NF

This information is in a 30-meter grid. The data were reclassified using the following classification.

Value	MRLC classification	Reclass	Mix
11	Open Water	1	Water
13	Perennial Ice/Snow	1	Water
21	Low Intensity Residential	2	Residential
22	High Intensity Residential	2	Residential
23	Commercial/Industrial/Transportation	2	Residential
31	Bare Rock/Sand/Clay	3	Quarry
32	Quarries/Strip Mines/Gravel Pits	3	Quarry
33	Transitional	4	Forest
41	Deciduous Forest	4	Forest
42	Evergreen Forest	4	Forest
43	Mixed Forest	4	Forest
51	Shrubland	5	Pasture
61	Orchards/Vineyards/Other	6	Cultivated
71	Grasslands/Herbaceous	5	Pasture
81	Pasture/Hay	5	Pasture
82	Row Crops	6	Cultivated
83	Small Grains	6	Cultivated
84	Fallow	6	Cultivated
86	Urban/Recreational Grasses	5	Pasture
91	Woody Wetlands	4	Forest
92	Emergent Herbaceous Wetlands	9	Wetlands

Digital Elevation Models provided:

Slope

Using Spatial Analysis Model Builder, discrete slope classes were identified based on percent slope. These values were then reclassified for individual forest assumptions. Lesser slopes were assigned a value of 0 and greater slopes were assigned a value of 1000.

Forest	Slope Break
Alabama	40
Jefferson	25
Sumter	25
Chatt-O	25
Cherokee	40
Daniel Boone	35

From the EPA Basins data:

Ecoregions	This shapefile was adjusted to match Dissmeyer and Stump physiographic zones (Alabama was further modified to match recent Omernik classification). Physiographic zones were assigned a value of 100 – 500 (in increments of 100) and converted to a grid (30 meters).

From these data sets the following queries were made for the sediment model:

Rd Inputs (Roads) – this is the sum the miles of roads (by surface type) and ATV trails for each watershed and ecoregion.

Lu Inputs (Land use) – this is the total number of grids summarized by ecoregion/land use/slope for each watershed.

Lu PVT Inputs (Private Land use) – this is the total number of grids from nonforest service lands (private) summarized by ecoregion/slope/slope for each watershed.

Tx Alt (A-I) – this is the combination of ecoregion/forest succession/slope for each watershed. This number is duplicated by the number of silviculture treatment options (usually 4). In addition treatments not found in the spectrum model are included such as prescribed fire and site preparation on National Forest lands and silviculture and urban growth on private lands.

With the completion of these data queries they are ready to place in the sediment model. This next section breaks the individual worksheets down and demonstrates their relationship.

Road Inputs

This is summarized data directly from ArcView – units are miles

	Col A	Col B	Col C	Col D-----
Row 1	Ecoregion Road surface or Trail	blank	watershed #	watershed #
Row 2	example		miles	miles
Row 3	BR gravel		46.6827	42.5454

LU Inputs

This is the tabulated data from the slope/ecoregion/slope combinations. Row 2 – the total number of acres for each watershed) is calculated for each watershed

	Col A	Col B	Col C	Col D-----
	Ecoregion Land use Slope	blank	watershed #	watershed #
	example			
Row 1	Concant		306010201	306010207
Row 2	acres		1089.512391	210.8303218
Row 3	BR cultivated <25		4097700	815400
Row 4	BR cultivated >25		311400	37800

LU PVT Inputs

This is the tabulated data from the slope/ecoregion/slope combinations. This data only includes values from private or nonforest service land.

	Col A	Col B	Col C	Col D-----
	Ecoregion Land use Slope	blank	watershed #	watershed #
	example			
Row 1	Concant		306010201	306010207
Row 2				
Row 3	BR cultivated <25		3647700	744300
Row 4	BR cultivated >25		219600	31500

Summary

This is the summary table for the entire spreadsheet. Rows 4-7 identify the baseline undisturbed annual sediment yields. Row 6 Column C (C6) is the sum of erosion from worksheet (LU natl coef C200) times the sediment delivery coefficient (sed del C7) expressed as total tons per year.

Rows 10-14 expresses the current condition in the same manner. The current condition separates forest service and private and includes roads. The values (average tons of sediment per year) are a representation of past and present effects for each watershed.

Row 16 is the percent increase of sediment of the current condition above the modeled baseline condition.

Rows 20-24 describe the effect of roads, forest service and private management activities in sediment. This is a prediction of future activities expressed in total tons.

Row 26 is the percent increase of sediment of the current condition and predicted future effects above the modeled baseline condition.

Col A	Col B	Col C	Col D-----
	blank	watershed #	watershed #
example			

Row 1		306010201	306010207
Row 2			
Row 3			
Row 4	Baseline		
Row 5	Road sediment	-	-
Row 6	Land Sediment	1,493.99	1,292.55
Row 7	Total	1,493.99	1,292.55
Row 8			
Row 9			
Row 10	Current		
Row 11	Road sediment	6,321.54	4,316.30
Row 12	Land Sediment FS	1,883.51	1,319.43
Row 13	Land Sediment PVT	4,168.71	1,376.74
Row 14	Total	12,373.76	7,012.48
Row 15			
Row 16	Percent increase over Baseline	828.23	542.53
Row 17			
Row 18	Period 1		
Row 19			
Row 20	Alternative A		
Row 21	Road sediment	20.93	20.22
Row 22	Land Sediment FS	7.14	7.86
Row 23	Land Sediment PVT	433.68	267.59
Row 24	Total	461.75	295.67
Row 25			
Row 26	Percent increase over Baseline	859.14	565.41

In the example above you have one alternative for one period. The remainder of the table has values for all alternatives for five ten-year periods for each watershed.

Road Construction Coefficient

This worksheet calculates the additional sediment from roads and fireline construction for each watershed, alternative and period combination.

Column B is the construction coefficient. It is assumed that construction values for roads are twice that of the constructed annual yield. Firelines are expressed as the measured value for one year.

Row 2 represents the Blue Ridge permanent (graveled) roads to be constructed for period 1. Most forests elected not to identify permanent road construction with silviculture activities. Temporary roads (native) are calculated in row 7 for period 1. Cell C7 (and subsequent cells) calculates the total number of acres treated with management treatments and applies a temporary road coefficient from the forests. All values are in tons of sediment.

Row 32 calculates the effect of firelines. This value is derived from the number of miles of fireline constructed based on acres burned.

Row 1021 sums the total number of tons of sediment from construction for Alternative A period 1 for each watershed. The remainder of the table summarizes the effects of roads and firelines for the remaining watersheds, alternatives and periods. These number are linked to the Summary worksheet.

	Col A	Col B	Col C	Col D
	Ecoregion road type or fireline	sediment coefficient	watershed #	watershed #
	Example			
Row 1	Alt A	Const values	306010201	306010207
Row 2	BR gravel	46.72	0	-
Row 3	p2	46.72	0	-
Row 4	p3	46.72	0	-
Row 5	p4	46.72	0	-
Row 6	p5	46.72	0	-
Row 7	BR native	38.04	0.005144022	0.00
Row 8	p2	38.04	0.005144022	0.00
Row 9	p3	38.04	0.005144022	0.00
Row 10	p4	38.04	0.005144022	0.00
Row 11	p5	38.04	0.005144022	0.00
Row 32	Fireline br	47.64	20.9242600	220.20850626
Row 33	p2	47.64	20.9242600	220.20850626
Row 34	p3	47.64	20.9242600	220.20850626
Row 1018	Period 1			
Row 1019				
Row 1020	Alternative A			
Row 1021	Road sediment		20.9345480	620.21844239

Current Road Sediments

This worksheet calculates the current road sediment. The miles of road are multiplied by the road values in column B. Values are expressed in tons. Row 33 sums the total and is linked to the Summary worksheet (Row 11).

	Col A	Col B	Col C	Col D
	Ecoregion road type or trail	sediment coefficient	watershed #	watershed #
	Example			
Row 1	Type	Const values	306010201	306010207
Row 2	BR gravel	23.36	1090.507872	993.860544
Row 3	BR native	19.02	581.043882	164.0475

Sediment Delivery

Rhoel's sediment delivery for land treatments is calculated based on his equation in Figure 4 of his paper. Row 7 is the value expressed as a decimal. This value is used in the summary worksheet.

	Col A	Col B	Col C	Col D
		blank	watershed #	watershed #
	Example			
Row 1	Concant		306010201	306010207
Row 2	acres		178540.8129	121279.9202
Row 3				
Row 4	sq mi		278.9700202	189.4998753
Row 5	log and coeff		0.747099864	0.803953825
Row 6				
Row 7	sed delivery		0.055859863	0.063672782

Coefficients

This worksheet uses values from Dissmeyer and Stump for each ecoregion (Blue ridge is shown). Values in yellow from Column C are taken from Dissmeyer and Stump. Column B converts these values to pounds per acre. Values not in yellow are interpreted.

	Col A	Col B	Col C
	Ecoregion road type or trail	sediment coefficient	watershed #
	Example		
Row 1	Coefficients	130 Blue Ridge Mountains	130 t/a/y
Row 2			
Row 3	CC	7360	3.68
Row 4	Shelter wood	4974.545455	
Row 5	Med Thinning	2123.636364	
Row 6	SingleTree	2327.272727	
Row 7	p burn	581.8181818	
Row 8	CC steep	28600	14.3
Row 9	Seedtree steep	19330.43478	
Row 10	Shelterwood steep	8252.173913	
Row 11	Med Thinning steep	9043.478261	
Row 12	SingleTree steep	2260.869565	

Row 20	site prep burn	7200	3.6
Row 21	Natural<12	100	0.05
Row 22	Natural>12	660	0.33
Row 23	strip mine	216000	108
Row 24	fs nonforest<	100	0.05
Row 25	pasture<	5240	2.62
Row 26	fs nonforest>	3696	0.33
Row 27	pasture>	13266	20.6
Row 28	Cultivated	47600	
Row 29	Urban	57120	
Row 30	Water	0	

This table also includes coefficients for each ecoregion, forest succession, slope and silvicultural prescription. Values for other activities not covered in spectrum are also included. See rows 103 – 110. These values are repeated for each period. Values from these columns are linked to the alternative tables.

	Col O	Col P
	example	
Row 1	Period 1	
Row 2	acres	
Row 3	Br 1 <25 ba 0	8174.545455
Row 4	Br 1 <25 ba 20	5671.462451
Row 5	Br 1 <25 ba 40	2679.048951
Row 6	Br 1 <25 ba 60	2935.944056
Row 7	Br 2 <25 ba 0	8174.545455
Row 8	Br 2 <25 ba 20	5671.462451
Row 9	Br 2 <25 ba 40	2679.048951
Row 10	Br 2 <25 ba 60	2935.944056
Row 11	Br 3 <25 ba 0	8174.545455
Row 12	Br 3 <25 ba 20	5671.462451
Row 103	Rv prescribed fire	276.6798419
Row 104	Rv site prep	320
Row 105	BR pvt forest < 25	8174.545455
Row 106	BR pvt forest > 25	31765.21739
Row 107	BR pvt site prep	7200
Row 108	BR pvt site prep	7200
Row 109	BR pvt urban < 25	57120
Row 110	BR pvt urban > 25	57120

This worksheet also includes the coefficients for all land uses for current and undisturbed conditions. These values are linked as coefficients to the LU natl, current pvt, and current coef worksheets.

	Col Z	Col AA	Col AB
	example		
Row 1	Composite	current	natural
Row 2			
Row 3	Br cultivated < 25	47600	100
Row 4	Br cultivated > 25	47600	660
Row 5	Br forest < 25	100	100
Row 6	Br forest > 25	660	660
Row 7	Br mines < 25	216000	100
Row 8	Br mines > 25	216000	660
Row 9	Br pasture < 25	500	100
Row 10	Br pasture > 25	13266	660
Row 11	Br urban < 25	57120	100
Row 12	Br urban > 25	57120	660
Row 13	Br water < 25	0	0
Row 14	Br water > 25	0	0
Row 15	Br wetland < 25	0	0
Row 16	Br wetland > 25	0	0
Row 17	PD cultivated < 25	47600	20

The following example is similar to the LU natl coef, current pvt, and current coef worksheets. Values in C3 and subsequent cells are converted to acres and multiplied to the erosion coefficient in column B. The natural condition uses column AB as a coefficient. The current condition worksheets use values from column AA. These values are totaled in Row 200 and linked to the summary worksheet.

	Col A	Col B	Col C	Col D
		erosion coefficient	watershed #	watershed #
	Example			
Row 1	Fshuc5text		306010201	306010207
Row 2	Acres		178540.8129	121279.9202
Row 3	Br cultivated < 25	100	101256.377	120148.97379
Row 4	Br cultivated > 25	660	50786.0889	16164.785359
Row 200	Total		53490690.56	40599755.19

Alternatives
These worksheets (for each alternative) are the links to the spectrum models. Values for the spectrum models are placed in Column B. The value from spectrum should be the total number of acres treated for each period by ecoregion forest succession, slope class, and silvicultural treatment. Column A is linked to the general coefficients values. Values for C3 (and subsequent cells) include taking the values from the associated Tx Alt worksheet as a proportion of the total number of acres. That

proportion for each watershed is then multiplied by column B divided by 10 and multiplied by the corresponding coefficient in coef general worksheet column P for the pounds of erosion associated with each watershed, ecoregion, forest succession class, slope and silviculture treatment.

Row 103 is an example of non-spectrum values. B103 is the number of acres that will be treated for the entire period. A percent or proportion of each watershed is then allocated and multiplied against the corresponding coefficient.

Row 104 is the total number of regeneration acres that are treated with a site preparation that could create erosion.

Rows 105 – 109 represent the predicted future activities of non-forest service or private land. The number of acres harvested for private land was based on a rotation age and assumed a clearcut or a percent increase in urbanization.

Rows 1001 and 1002 represent the total number of pounds created from forest service and non-forest service lands

	Col A	Col B	Col C	Col D
		Spectrum Value	watershed #	watershed #
	Example			
Row 1		**tot ac by decade**	306010201	306010207
Row 2			178540.8129	121279.9202
Row 3	Br 1 <25 ba 0		26.01021391	46.20137257
Row 4	Br 1 <25 ba 20	1		32.05430212
Row 5	Br 1 <25 ba 40	1	8.524343854	
Row 6	Br 1 <25 ba 60	1	9.341746689	16.59353978
	Br 2 <25 ba 0	1	20.81447585	47.09453448
Row 8	Br 2 <25 ba 20	1	14.44098866	32.67397379
Row 9	Br 2 <25 ba 40	1	6.821541332	15.43432157
Row 10	Br 2 <25 ba 60	1	7.475661734	16.914325
Row 11	Br 3 <25 ba 0	1	175.9027904	74.60534877
Row 103	Rv prescribed fire	17400	0	0
Row 104	Rv site prep		0	0
Row 105	BR pvt forest < 25		5188596.559	2636738.947
Row 106	BR pvt forest > 25		10081634.56	5725924.784
Row 107	BR pvt site prep		0	0
Row 108	BR pvt site prep			0
Row 109	BR pvt urban < 25		116259.6265	33663.46264
Row 1001	Period 1 fs		255831.3787	247099.3445
Row 1002	Period 1 pvt		15527496.19	8405219.429

Tx Alternatives

This is the grid data from spatial analysis for each alternative. Column B is the sum of the watersheds converted to acres. Cell C3 (and subsequent cells) is the number of meters (grids) including private. Row 301 – 305 is used to set up a proportional relationship for road construction values.

	Col A	Col B	Col C watershed #	Col D----- watershed #
	example			
Row 1	Composite	Value	306010201	306010207
Row 2				
Row 3	Br 1 < 25	5169.123343	7534800	13383900
Row 4	Br 1 < 25	5169.123343	7534800	13383900
Row 103	Rv prescribed fire	0		
Row 104	Rv site prep	0		
Row 105	BR forest <25		256864500	130533300
Row 106	BR forest >25		128439000	72947700
Row 107	Br PVT site prep			
Row 108	Br PVT site prep			
Row 109	BR urban <25		4118400	1192500
Row 110	BR urban >25		499500	31500
Row 301	Huc		306010201	306010207
Row 302	br acres	632890.3555	68466.92125	66124.88116
Row 303	pd acres	125454.2655	0	0
Row 304	rv acres	70178.47197	0	0
Row 305		total		
Row 306		828523.093	68466.92125	66124.88116

Determining Sediment Coefficients for Roads, ATV Trails, and Firelines

Introduction

During the summer of 2002, sediment coefficients for roads, ATV trails, and firelines were determined for the Southern Appalachian National Forests undergoing Plan Revision. The sediment coefficients were developed for use in a cumulative effects model for water quality. The coefficients express, in tons of sediment per mile of road/ATV trail/fireline, the average annual yield of sediment entering a stream from a road, ATV trail, or fireline for each ecoregion. The Forests for which these coefficients were developed are: National Forests in Alabama, Chattahoochee-Oconee National Forest (NF), Cherokee NF, Daniel Boone NF, Sumter NF, and Jefferson NF. Ecoregion boundaries used were those found in Dissmeyer and Stump, 1978.

The Watershed Erosion Prediction Project (WEPP) model for roads was used to develop the coefficients. This model was developed by the Rocky Mountain Research Station and San Dimas Technology and Development Center. Documentation of the WEPP:Road model is on the internet website http://forest.moscowfsl.wsu.edu/fswepp/.

Process

Forests or Ranger Districts identified roads that were representative of the roads on their respective units. Roads selected contained at least one stream crossing. All roads identified were graveled.

An on-site survey was conducted to determine inputs for the WEPP:Road model. The road was divided into segments based on water diversions. Functioning waterbars, broadbased dips, wing ditches, and culverts were considered to be water diversions. If no water diversion was present and the water had created its own diversion, this also marked a segment break. Additionally, a crest in the road, where water ran off in two different directions, was considered a segment break.

Horizontal distances for road segment lengths, road widths, road fillslope lengths, and buffer lengths were paced off or visually estimated for each road segment. Some buffer lengths over 300 feet long were estimated from topographic maps.

Road gradients, fillslope gradients, and buffer gradients were measured with a clinometer or were visually estimated for each road segment to determine an average slope gradient. In areas where roads or trails occurred in the buffer below the road segment being inventoried, the buffer length and slope were calculated as if the road or trail in the buffer did not exist.

The buffer began at the end of the water diversion device or at the bottom of the fillslope whichever was applicable. If there was scour or a sediment trail at the end of a diversion, then the buffer began where the scour or sediment trail ended. The buffer ended at the nearest channel. If a channel alternated between being scoured and unscoured, then it was considered to be a scoured channel.

Other on-site data collected included the road design and status of road ditch vegetation. These parameters were visually determined. All roads were calculated as unrutted.

Measurements were then input into the WEPP: Road model on the interactive internet site http://forest.moscowfsl.wsu.edu/fswepp/. Thirty years of simulation were used. This was based on the WEPP documentation that states "[f]or climates with more than 500 mm of precipitation, 30 years of simulation is generally adequate to obtain an estimate of erosion" (Elliot et. al, 1999). The WEPP: Road model was calculated for each ecoregion or ecoregion subdivision. Most ecoregions were divided into two or more subdivisions. The subdivisions were determined by the geographical range of each ecoregion and National Forest.

The climate station used was the weather station closest to the site location. For ecoregions which were subdivided, and where the data used in the model was collected from another subdivision, a climate location central to the Forest Service watersheds in the subdivided ecoregion was used. It was assumed that the weather stations used were representative of each ecoregion's or subdivided ecoregion's climate.

Soil textures were either determined from consultation with the Forest Soil Scientist or were determined on-site. The predominant soil texture was used for the entire road/trail/fireline segment surveyed. The rock content of a soil was not taken into consideration, as the soil texture choices available in WEPP:Road did not include any appreciable rock content. There were three segments on one ATV trail section that were predominately bedrock. These three segments were calculated as a gravel surface instead of native to account for the bedrock.

For each ecoregion or ecoregion subdivision a sediment yield per mile of road was determined. Adding the amount of sediment from each road segment and then dividing by the total length of the road segments calculated this yield. This sediment yield, described in tons per mile, was used as the sediment coefficient in the cumulative effects model.

Sediment yields were determined separately for native, graveled, and paved roads. The same data was used to determine sediment yields for each road surface. It was assumed that road templates were was representative of all three road surface types. Portions of firelines or ATV trails that included a long series of tank traps were excluded from sediment calculations.

The same procedure used for roads was repeated with firelines and ATV trails. The exception was that firelines and ATV trails were considered to be rutted and outsloped. Only the native road surface was run for firelines and ATV trails, except for the three segments of ATV trail previously noted which were run as gravel surface due to bedrock content.

The sediment coefficients for each ecoregion or ecoregion subdivision are shown in the attached data summary. This summary also shows weather stations soil textures, National Forests and Ranger Districts, and lengths of road, ATV trail, and fireline surveyed.

Assumptions, uncertainties, and limitations

Many of the assumptions used in determining the sediment coefficients have already been presented in the previous section under "Process". Other assumptions are listed further on in this section. The sediment coefficients should not be considered as absolute values. Many of the measurements taken were estimates, and as such will not yield accurate values. Additionally, WEPP:Road documentation that "[a]ny predicted runoff or erosion value—by any model—will be, at best, within plus or minus 50 percent of the true value" (Elliot et al., 1999).

The road section surveyed for the Southern Piedmont – West ecoregion had some non-functional waterbars. This was considered as not typical for that ecoregion. In order for the surveyed road to more accurately reflect a typical road for the ecoregion, the assumption was made that these waterbars were functional.

Some assumptions were made due to limitations of the WEPP:Road model. These assumptions are as follows:

Any road/trail/fireline gradient over 40 percent would yield the same results as a 40 percent gradient. WEPP:Road does not accept road gradients over 40 percent.

Any road/trail/fireline gradient of less than one percent would yield the same results as a 0.3 percent gradient. WEPP:Road does not accept road gradients of less than 0.3 percent.

The absence of fillslopes would yield the same results as fillslopes with a 0.3 percent gradient and a one-foot length. WEPP:Road does not accept fillslope measurements with less than a 0.3 percent gradient and one foot length.

Any buffer length greater than 1000 feet would yield the same results as a 1000 foot buffer. WEPP:Road does not accept buffer lengths greater than 1000 feet.

WEPP:Road does not accept road segment lengths greater than 1000 feet. Any distances above 1000 feet were rounded down to 1000. For example, if a road segment that was 1200 feet long, sediment calculations were estimated for a 1000-foot segment. For calculating total road length, 1000 feet was used, not 1200 feet.

Table B-33: Road Sediment Coefficients

		Data Source Used for Sediment Yields		Data collected and distances (miles) ("X" denotes data collected)				Sediment Coefficients tons of sediment per mile				
Ecoregion	**Weather Station**	**National Forest**	**Ranger District**	**ATV Trail**	**Fireline**	**Graveled Road**	**Soil Texture**	**ATV Trail**	**Fire-line**	**Native Road**	**Gravel Road**	**Paved Road**
Appalachian Ridge	Roanoke, VA	Jefferson	New Castle	X 0.48 mi			silt loam	9.38				
and Valley	Roanoke, VA		New Castle		X 0.44 mi		sandy loam		6.20			
-North	Roanoke, VA		New Castle			X 0.96 mi	silt loam			10.55	11.39	4.46
Appalachian Ridge	LaFayette, GA	Jefferson	New Castle				silt loam	20.61				
and Valley	LaFayette, GA		New Castle				sandy loam		18.64			
-South	LaFayette, GA		New Castle				silt loam			26.20	26.39	10.13
Blue Ridge Mnts	Bristol, TN	Cherokee	Nolichucky	X 0.70 mi			clay loam	18.93				
-North	Bristol, TN		Watauga		X 0.96 mi		clay loam		23.21			
	Bristol, TN		Watauga			x 1.13 mi	clay loam			15.54	10.19	8.31
Blue Ridge Mtns	Coweeta, NC	Chattahoochee	Tallulah	x 0.70 mi			clay loam	30.49				
-South	Coweeta, NC		Tallulah		X 0.40 mi		clay loam		47.64			
	Coweeta, NC		Tallulah			X 0.82 mi	clay loam			19.02	23.36	7.37
Cumberland	Farmers, KY	Daniel Boone	Morehead	X 0.18 mi			silt loam	*1.83*				
Plateau	Farmers, KY		Morehead		none		silt loam					
-North	Farmers, KY		Morehead			X 1.24 mi	silt loam			*28.29*	*21.72*	*26.43*
Cumberland Plateau, North coefficients based on distance-weighting between Morehead and Redbird Ranger Districts (these are the values to be used in cumulative effects model) ---------------->								1.83	7.47	19.89	16.29	21.75
-North	Manchester, KY	Daniel Boone	Redbird	none								
	Manchester, KY		Redbird		X 0.21 mi		sandy loam		*7.47*			
	Manchester, KY		Redbird			X 1.0 mi	sandy loam			*9.64*	*9.66*	*16.04*

		Data Source Used for Sediment Yields		Data collected and distances (miles) ("X" denotes data collected)				Sediment Coefficients tons of sediment per mile				
Ecoregion	**Weather Station**	**National Forest**	**Ranger District**	**ATV Trail**	**Fireline**	**Graveled Road**	**Soil Texture**	**ATV Trail**	**Fire-line**	**Native Road**	**Gravel Road**	**Paved Road**
Cumberland	Anniston, AL	NF in Alabama	Talladega	X 0.65			clay loam	13.23				
Plateau	Anniston, AL		Talladega		X 0.34 mi		clay loam		10.33			
-South	Anniston, AL		Talladega			X 0.61 mi	clay loam			21.74	20.44	14.93
Southern Coastal Plains	Tuscaloosa, AL	NF in Alabama	Oakmulgee	X 0.22 mi			clay loam	0.89				
	Tuscaloosa, AL		Oakmulgee		X 0.37 mi		sandy loam		12.10			
	Tuscaloosa, AL		Oakmulgee			X 1.60 mi	clay loam			9.03	11.51	8.66
Southern Piedmont	Greenwood, SC	Sumter	Long Cane	X 0.43 mi			sandy loam	2.84				
-East	Greenwood, SC		Long Cane		X 0.80 mi		sandy loam		2.06			
	Greenwood, SC		Long Cane			X 0.60 mi	sandy loam			1.05	1.13	2.64
Southern Piedmont	Lynchburg, VA	Sumter	Long Cane				sandy loam	2.03				
-North	Lynchburg, VA		Long Cane				sandy loam		1.45			
	Lynchburg, VA		Long Cane				sandy loam			0.89	0.83	1.63
Southern Piedmont	Siloam, GA	Oconee	Oconee	X 0.64 mi			clay loam	11.78				
-West	Siloam, GA		Oconee		X 0.47 mi		clay loam		0.98			
	Siloam, GA		Oconee			X 0.61 mi	clay loam			0.95	1.52	0.88

Endemism Sediment Profile

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Introduction

Ecological communities worldwide are undergoing rapid modification due to ongoing human actions (Vitousek 1994). Current rates of landscape change create an imperative for scientists to understand and quantify anthropogenic impacts on ecosystems (Lubchenco et al. 1991). The integrity of aquatic systems is jeopardized by multiple stressors, but sedimentation due to erosion of disturbed soils is paramount among them (Judy et al. 1984). The effects of sediment loading on aquatic ecosystems are cumulative as fines are transported and deposited along the stream continuum, burying and filling in stream beds and interfering with the foraging and reproduction of aquatic organisms (Waters 1995). With the number of endangered fishes in the southern U.S. increasing more than 100% over the last 20 years (Warren et al. 2000), and a projected extinction rate of 2.4% per decade for U.S. freshwater fish (Ricciardi and Rasmussen 1999), land management that incorporates conservation from the planning stages is critical if we are to sustain healthy streams and rivers for future generations.

The southeastern U.S. contains one of the richest aquatic faunas in the temperate world, due in large part to the extraordinarily high level of endemism (Burr and Mayden 1992; Warren and Burr 1994). Endemism refers to restricted geographic range in organisms, and is scale dependent. An aquatic species may, for example, be native to a continent, physiographic region, drainage basin, or a single stream, but for purposes of this discussion endemism refers to distributions at regional scales or below. Areas inhabited by many endemic species, therefore, are more distinctive biologically than other areas with equal or even higher species richness but lower endemism. Range-restricted endemic species are often disproportionately listed as imperiled (i.e., special concern, threatened, or endangered). Endemic fishes have been characterized as susceptible to environmental changes due to their adaptation to local conditions and relatively specialized use of indigenous resources (Angermeier 1995; Scott and Helfman 2001).

Loss of endemics is part of the process of biotic homogenization, which has been called one of the most prominent forms of biodiversity loss (McKinney and Lockwood 2001). Homogenization occurs in faunas over multiple spatial scales as endemic taxa are replaced with more broadly distributed taxa, such that formerly distinct locales become more similar biologically. In areas with high levels of endemism, research suggests that homogenization in these faunas is tied to intensive land use (Scott and Helfman 2001). Human activities that disturb soils and alter land cover have impacts that accumulate within drainage basins, altering stream habitats and resulting in a depletion of endemic taxa.

We examined the relationship between the proportion of endemic taxa in stream fish assemblages (as a surrogate for aquatic community health) and the cumulative sediment load modeled from watershed land cover. Our objective was to determine the functional form of the relationship and whether indicators of aquatic health could be developed. These indicators of aquatic health could be a useful tool for identifying and prioritizing watersheds where the Forest Service can make a positive contribution its health. Our goal was to provide conservation planning tools that can guide sustainable management of landscapes and proactively protect the integrity of aquatic resources.

Methods

Fish collections used in these analyses were obtained from universities and natural resource agencies. The watershed above each collection site was modeled (by physiographic province) for sediment yield using current land-use information and road network.

Coastal Plain - Fishes were collected at 11 sites in the Five Runs Creek watershed (southern Coastal Plain, Alabama) using backpack electrofishing gear. A longitudinal reach of 100 m was sampled via two-pass depletions for approximately 45 minutes per pass at each study site (Johnston 2000).

Piedmont - Fishes were collected at 33sites using backpack electrofishing gear. A longitudinal reach of 100 m was sampled via three-pass depletions that represented at least two habitat types (pool, riffle; Ron Ahle, South Carolina Department of Natural Resources).

Southern Blue Ridge and Ridge and Valley - Fishes were collected and 38 sites in the Blue Ridge and 33 sites in the Ridge and Valley using electrofishing gear and seines. One of two methods were used: sampling 35-times the stream width or repeated sampling of a 100m reach until no additional individuals were captured (Byron Freeman and David Walters, Department of Ecology, University of Georgia).

Central Appalachian/Western Allegheny - Fishes were collected and 21 sites using one pass with backpack electro-fishing gear. An attempt was made to include all habitat types; thus, sample reaches varied in length (Daniel Boone National Forest).

Endemic fish taxa were identified from the list of fishes from each region (Table 1). Two criteria were used for determining endemism. First, fishes that were described in Mayden (1987) as being endemic to the Interior Highlands were so designated in the Ohio River tributaries draining the Central Appalachian/Western Allegheny Plateau region of Kentucky. Furthermore, the highland endemic concept was extended to the Upper Mobile drainages of northwest Georgia, such that only fishes with ranges restricted to the southern Appalachian highlands were designated as endemic. Second, fishes in other regions (i.e., Coastal Plain, Piedmont) were determined to be endemic if they were restricted to that particular physiographic province and their ranges did not extend beyond 3 river drainages, based on information published in Warren et al. (2000). The total number of individual endemic fish was summed for each collection, and this number was divided by the total number of fish captured in the collection. The result represented relative abundance of endemic fish in each stream.

Data were analyzed by examining the bivariate relationship between percentage increase in sediment load over background rates in a watershed and relative abundance of endemic fishes in the stream. Simple linear regression was used to quantify the strength and predictive power of the relationship. Alternatively, sediment may act as a limiting factor on abundance rather than serving as a linear predictor of mean abundance (Terrell et al. 1996). Quantile regression is an alternative to least squares regression useful for modeling upper or lower bound slopes in bivariate relationships (Scharf et al. 1998). Also called least absolute values regression, it involves minimizing the sum of the absolute values of the residuals rather than the sum of squares of residuals (as in conventional least squares regression). Estimates are obtained through minimization of

$$\sum_i \left| y_i - \beta_o - \beta_1 x_i \right| h_i$$

where h_i is a multiplier equal to a chosen quantile value (i.e., 0.5 for the median) if the residual between the absolute values is positive or one minus the value otherwise (Scharf et al. 1998). To model the upper bound in a relationship (below which abundance may be constrained), we used the 90th percentile.

In addition, endemism was modeled separately for each region using locally weighted regression (LOESS; Cleveland and Devlin 1988) to objectively classify ranges of response to sediment increase. The LOESS procedure (PROC LOESS; SAS Institute) was specified as a linear function with quadratic weighting of neighboring points. The smoothing parameter α was selected for each region by interactively viewing results of a series of α set from small (0.1) to successively larger values, smoothing the regression line until breaks in response trends became apparent. Range classes were identified by breaks along the LOESS-derived line where the trend shifts from positive or no slope to negative slope.

Results and Discussion

The combined data from 137 streams and their catchments formed a wedge-shaped pattern when proportion of endemic fishes was plotted against percent increase of sediment above natural rates (Figure 1), clearly violating the assumption in ordinary least squares regression of equal variance in the dependent variable along the range of the independent variable (homoscedasticity). Transformation of the variables by taking the arcsine of the square root of proportion endemic fishes and log of percent sediment increase improved the error structure but did not eliminate heteroscedasticity (Figure 2). Ordinary least squares regression performed on the transformed data produced a significant model ($F(1,135)=43.31$, $P=9.5E-10$). Although the probability is less than one in a billion that no relationship exists between sediment load and abundance of endemics, predictive power of the model was low ($r2=0.24$).

The wedge-shaped pattern of the untransformed data (Figure 1) suggests that sediment, rather than serving as a predictor of mean abundance, may limit the ability of stream systems to support endemic fishes. That is, the upper bound of the relationship decreased sharply with increasing sediment (Terrell et al. 1996). Quantile regression is an alternative approach to regression that is useful for modeling boundaries in wedge-shaped relationships (Scharf et al. 1998). The 50th percentile regression line (y= 0.33-1.2E-5x) models the central tendency (median) in the relationship, splitting the data evenly along the range of the independent variable so that equal number of data points lie above the line and below it (Figure 3). The 90th percentile regression line models the upper 10% of data points along the range of sediment increase. The 90th percentile line (y=0.753-2.2E-5x) was steeper than the regressions of central tendency (i.e., OLS and median regressions). This suggests that increased sediment load may reduce the capacity of stream systems to support high proportions of endemic fishes more rapidly than it decreases their average or median abundance (Figure 3). The variation in the data below this upper bound is consistent with the concept of limiting habitat factors: while other factors (abiotic and biotic) may reduce the carrying capacity for endemic fishes to below this bound, sediment increases appear to limit the maximum abundance of endemics to near this boundary (Terrell et al. 1996). The slope of this upper bound indicates that for each 1,000% increase in sediment load over background, the maximum relative abundance of endemics that the stream is capable of supporting is reduced by 2.2%.

Endemism and increases in sedimentation varied considerably among regions. Highland regions tended toward lower sediment increases and higher endemism whereas lowlands fell toward the upper end of the sediment range and lower endemism values (Figure 1). While this observation is likely due to natural sediment transport processes affecting the evolutionary history of the faunas, it is also likely to have been exacerbated by more intensive land use (e.g., agriculture) over the last two centuries in the Piedmont and Coastal Plain relative to highland regions. Endemism at sites in each region was modeled using locally weighted regression (LOESS) to objectively determine ranges in response to sediment increase. Ranges were identified by breaks in the LOESS line from positive or no slope to negative slope.

On Alabama's Gulf Coastal Plain, sediment increases at the twelve sites spanned the widest range of any region (2,017% to 35,247% over background rates; Figure 4). Relative abundance of endemic fishes at these sites ranged from 0 to 0.70. The LOESS line indicated the first range on the Gulf Plain at approximately a 0 to 13,000% sediment increase, and a second at about 13,000 to 25,000% increase. On South Carolina's Piedmont, sediment increases had a clumped distribution, with one group of sites in the 0 – 20,000 % range and another group falling around 20,000 – 30,000% over background (Figure 5). Relative abundance of endemic fishes at the 33 Piedmont sites ranged from 0 to 0.31. The LOESS line indicated the first range for the Piedmont at approximately 0 to 20,000% sediment increase, and a second at about 20,000 to 30,000% increase. On Kentucky's Central Appalachians/Western Allegheny Plateau, sediment increases at the 21 sites ranged from 175% to 6,425% over background rates (Figure 6). Relative abundance of endemic fishes at these sites ranged from 0 to 0.51. The LOESS line indicated the first range on the Central Appalachians/ Western Allegheny Plateau at approximately 0 to 2,200% sediment increase, and a second at about 2,200 to 4,700% increase. In the southern Ridge and Valley province of Georgia, sediment increases ranged from 224 – 16,794 % over background rates in 33 catchments (Figure 7). Relative abundance of endemic fishes at the Ridge and Valley sites ranged from 0 to 0.71. The LOESS line indicated the first range in the Ridge and Valley Region at approximately 0 to 2,300% sediment increase, and a second at about 2,300 to 3,800% increase. In the southern Blue Ridge of Georgia, sediment increases ranged from 137 – 6,544 % over background rates in 38 catchments (Figure 8). Relative abundance of endemic fishes at the Blue Ridge sites ranged from 0 to 0.85. The LOESS line indicated the first range in the Blue Ridge at approximately a 0 to 500% sediment increase, and a second at about 500 to 2,800% increase over background rates.

In most of these regions, it appears that the upper range would serve as a reasonable cutoff below which faunas remain in relatively good condition. Watersheds that fall within middle range should be considered for a more in-depth investigation to identify sources of sedimentation. Watersheds within the lower range should be identified as areas for watershed improvement, provided the Forest Service can make a meaningful contribution.

Uncertainty in the Data and Analytical Results

One of the assumptions in regression analysis, or for that matter in most statistical analyses, is that the data are a reasonably representative sample of a larger population of interest. The data available for this analysis have a number of important limitations. We compiled extant fish collections from the five regions, and while we made post-hoc attempts to assess the quality of these samples, fish collection methods were not uniform among regions. The Gulf Coastal Plain was the most poorly represented region, since only twelve data points were available from a small area in and around Conecuh National Forest, which provided a limited picture of sediment-endemic relations for that broad region. Several regions suffered from a very narrow range of sediment increase values. For example, the Blue Ridge spanned a narrow range at much lower levels of sediment increase (137 % to 6,544 %), which suggests that truly impacted watersheds were not included in the characterization. Finally, because the data were not collected as randomly selected sample watersheds from a regional population, model parameters technically should not be applied to the rest of the region. Nonetheless, the data do provide valuable insight into sediment-fish relations and variation within and among several southern regions.

Although the rationale for sedimentation effects on endemic fishes is clear for highland regions (Scott and Helfman 2001), it is less clear for lowland regions. Endemism may not be a useful indicator of sediment effects in lowland systems for two main reasons. First, the use of endemism assumes that specialized adaptations to local conditions have had time to evolve in a given locale, which seems a valid assumption in the ancient, unglaciated southeastern highlands but more questionable in the lowlands, which have experienced repeated sea-level fluctuations over geologic-evolutionary time scales. Thus, younger faunal assemblages may have developed endemic forms but may not have developed highly specialized ecologies. Moreover, the greater sediment accumulations in lowlands may have required greater adaptation and tolerance of fine sediment in life-history traits and behaviors. Secondly, even if endemic lowland species are susceptible to the excess sedimentation caused human alteration of landscapes over the last 200 yrs, their response may have been a thing of the past. That is, historical disturbance may have more or less erased the prehistoric assemblage structure on these landscapes before it could be scientifically documented. Intensive row-cropping over many decades in this region likely left no watersheds untouched. The question is whether least-disturbed conditions on these heavily-impacted landscapes can provide us a reasonable approximation of the fauna that developed here under natural evolutionary processes. The only way to assess this is to find candidate reference systems and examine how they differ biologically from impacted systems.

Despite these limitations in the data, the results presented here constitute the best information available to us in our characterization of sediment-fish relations in the southern U.S. Many of the uncertainties and problems in the data outlined here could be reduced or eliminated by setting clear objectives and properly conducting a field study with standard sampling protocols. Although we suggest that these indicator ranges are suitable as a guide to set goals and objectives for forest planning, we recommend that the assumptions of these models be tested over the course of the forest plans to provide managers and decision makers with the information needed for maintaining or restoring the health of watersheds and aquatic communities.

Table B-34. Endemic species collected in each physiographic province.

Coastal Plain	Central Appalachian/ Western Allegheny	Piedmont	Highland Endemics Blue Ridge/Ridge and Valley
Etheostoma colorosum	*Etheostoma baileyi*	*Cyprinella chloristia*	*Cyprinella caerulea*
Ammocrypta bifascia	*Etheostoma cinereum*	*Cyprinella pyrrhomelas*	*Cyprinella trichroistia*
Lythrurus atrapiculus	*Etheostoma kennicotti*	*Hybopsis zanema*	*Hybopsis lineolata*
Etheostoma davisoni	*Etheostoma obeyense*	*Notropis alborus*	*Macrhybopsis aestivalis*
Hybopsis sp.	*Etheostoma sagitta*	*Notropis chlorocephalus*	*Macrhybopsis sp. cf. M. aestivalis*
Notropis harperi	*Etheostoma virgatum*	*Notropis hypsinotus*	*Notropis asperifrons*
	Phoxinus cumberlandensis	*Notropis rubescens*	*Notropis chrosomus*
		Notropis scepticus	*Notropis xaenocephalus*
		Etheostoma hopkinsi	*Phenacobius catostomus*
		Etheostoma thalassinum	*Noturus munitus*
		Percina crassa	*Cottus carolinae ssp.*
			Cottus sp. cf. C. carolinae
			Cottus bairdi ssp.
			Cottus sp. cf. C. bairdi
			Etheostoma etowahae
			Etheostoma trisella
			Etheostoma coosae
			Etheostoma jordani
			Etheostoma rupestre
			Etheostoma scotti
			Etheostoma sp. cf. E. brevirostrum
			Percina antesella
			Percina aurolineata
			Percina jenkinsi
			Percina palmaris

Table B-34. Endemic species collected in each physiographic province.

Coastal Plain	Central Appalachian/ Western Allegheny	Piedmont	Highland Endemics Blue Ridge/Ridge and Valley
			Percina sp. cf. P. caprodes
			Percina sp. cf. P. macrocephala

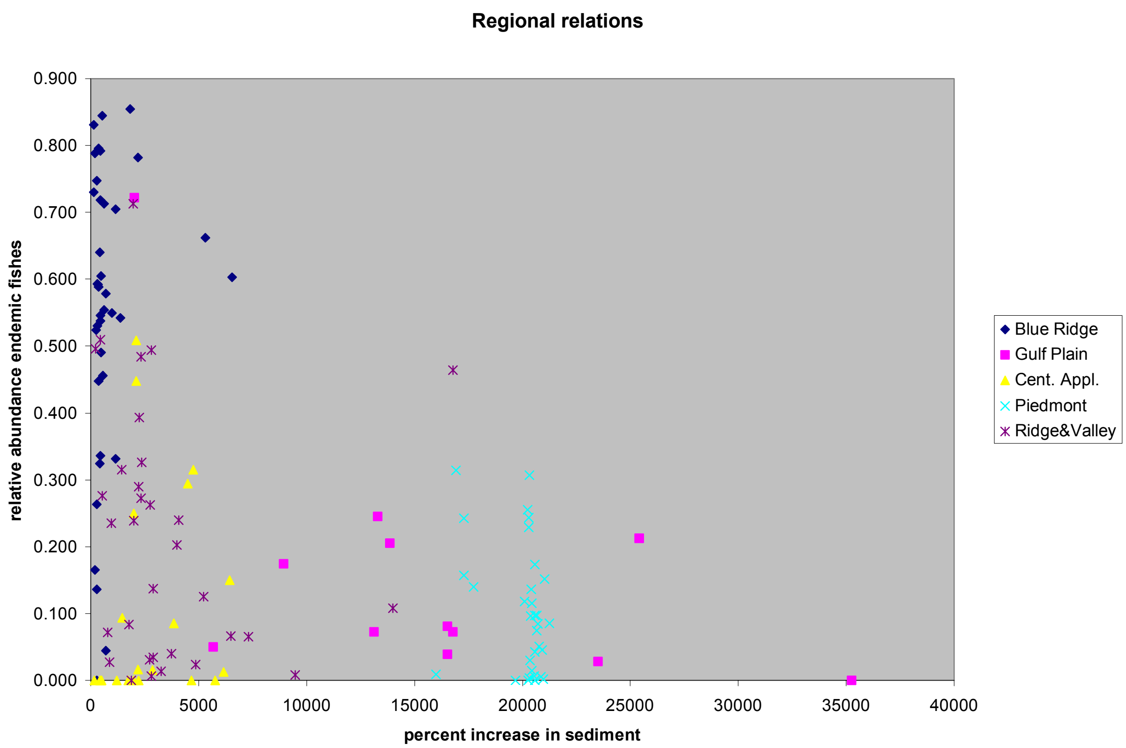

Figure B-1. Plot of the relative abundance of endemic fishes against percent increase in catchment sediment load over natural rates at 137 stream locations in 5 physiographic regions of the southern U.S. (Cent. Appl. = Central Appalachian Plateau and Western Allegheny regions).

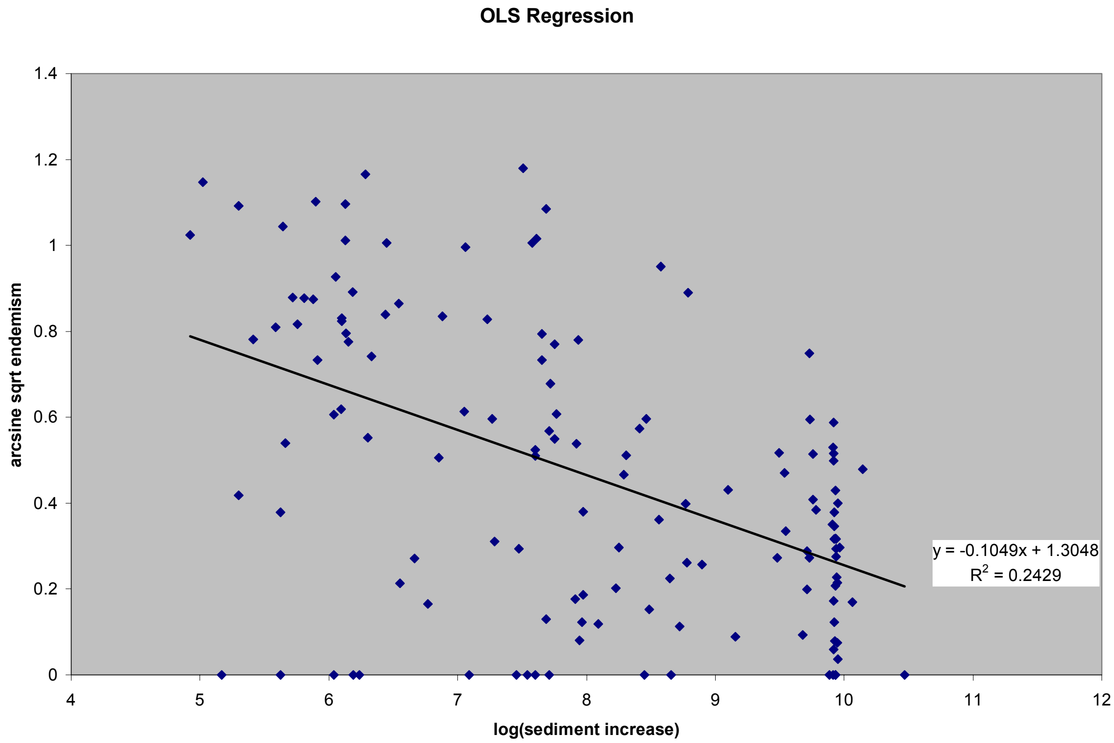

Figure B-2. Plot of the transformed relative abundance of endemic fishes (arcsine square root) against the natural log of percent increase in catchment sediment load over natural rates. The ordinary least squares regression line is shown ($F_{(1,135)}$=43.31, P=9.5E-10).

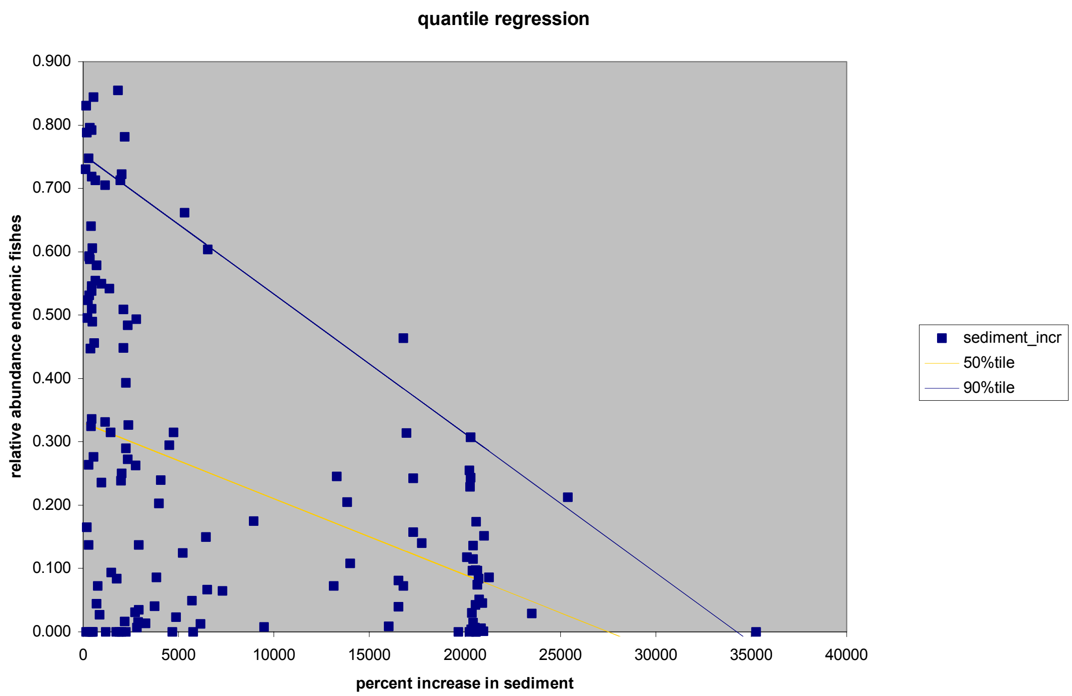

Figure B-3. Quantile regression results showing median regression line (50th percentile) and 90th percentile line modeling the upper bound of endemic abundance along the range of sediment increase.

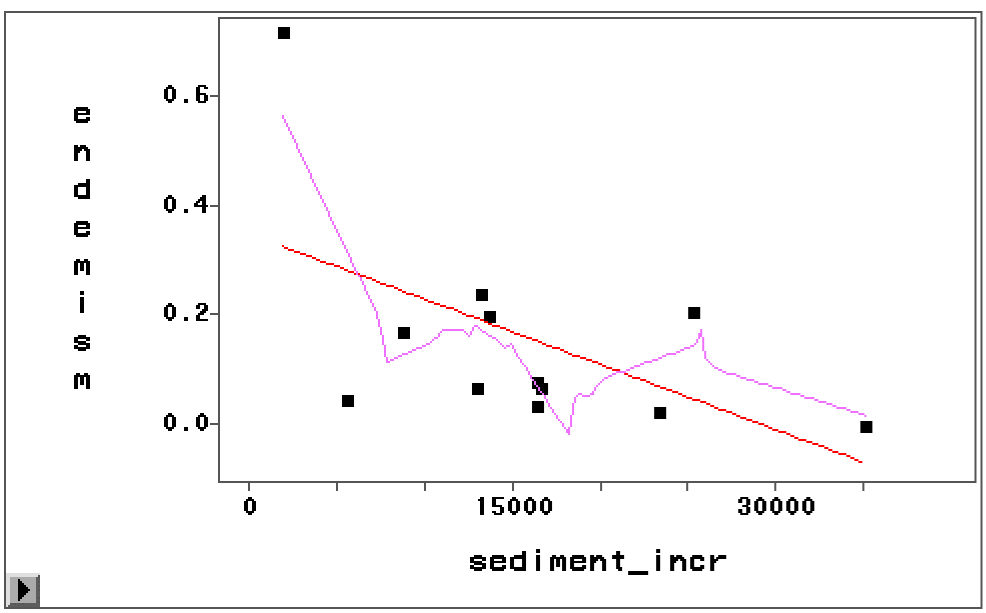

Figure B-4. Alabama Gulf Coastal Plain data with OLS regression line and LOESS regression line plotted.

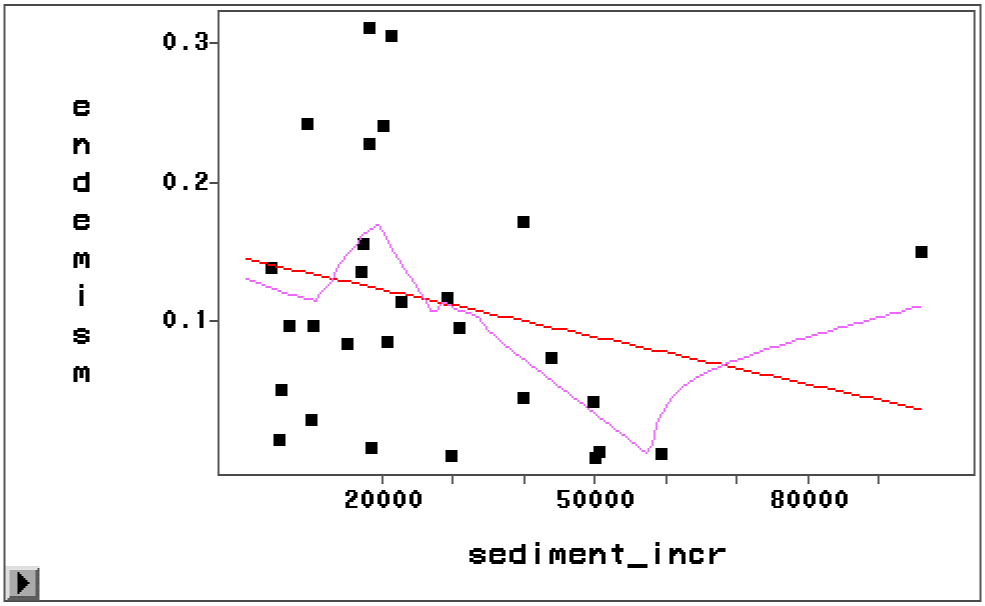

Figure B-5. South Carolina Piedmont data with OLS regression line and LOESS regression line plotted.

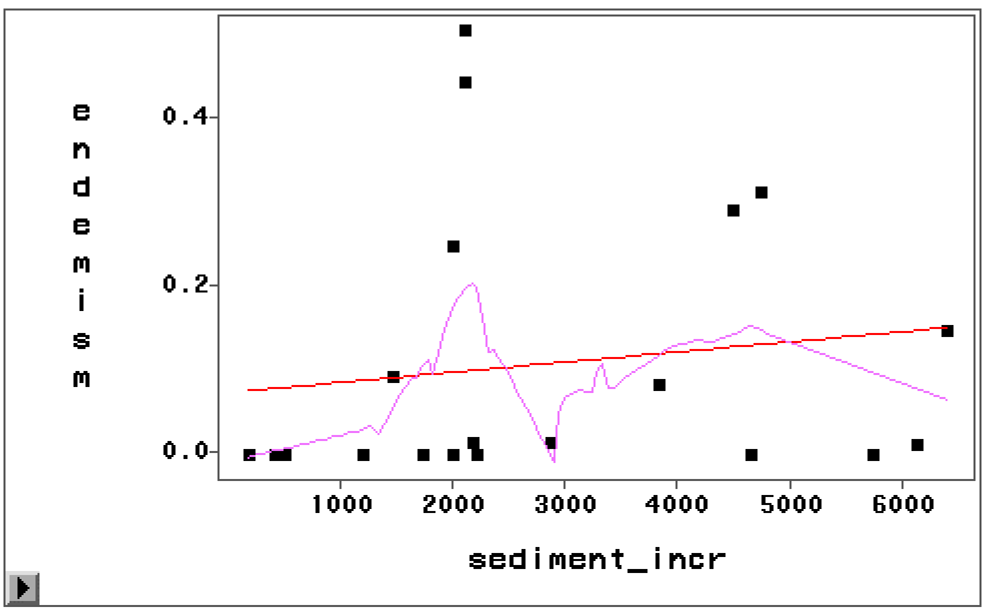

Figure B-6. Kentucky Central Appalachian/Western Allegheny data with OLS regression line and LOESS regression line plotted.

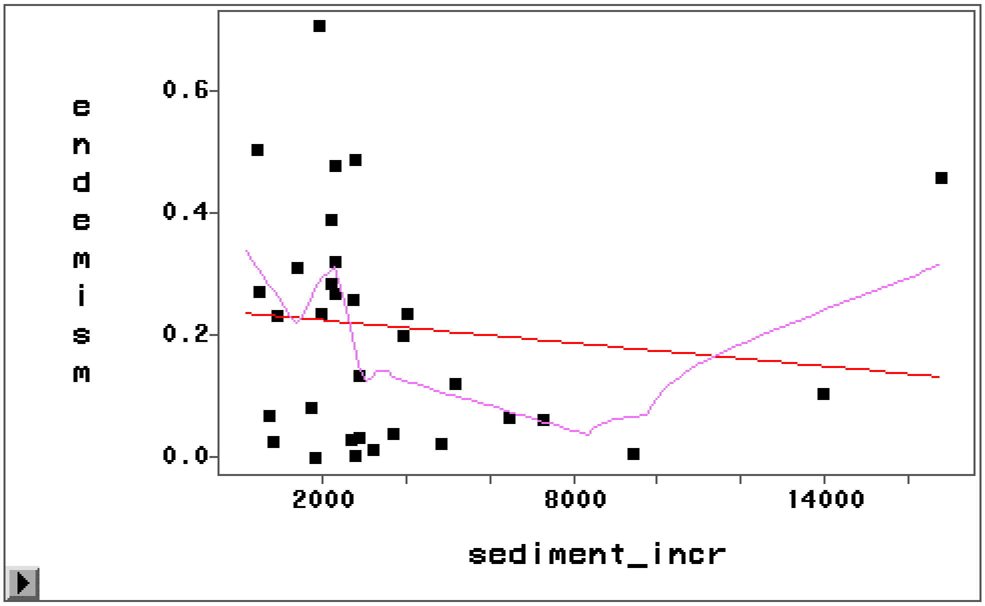

Figure B-7. Georgia Ridge and Valley data with OLS regression line and LOESS regression line plotted.

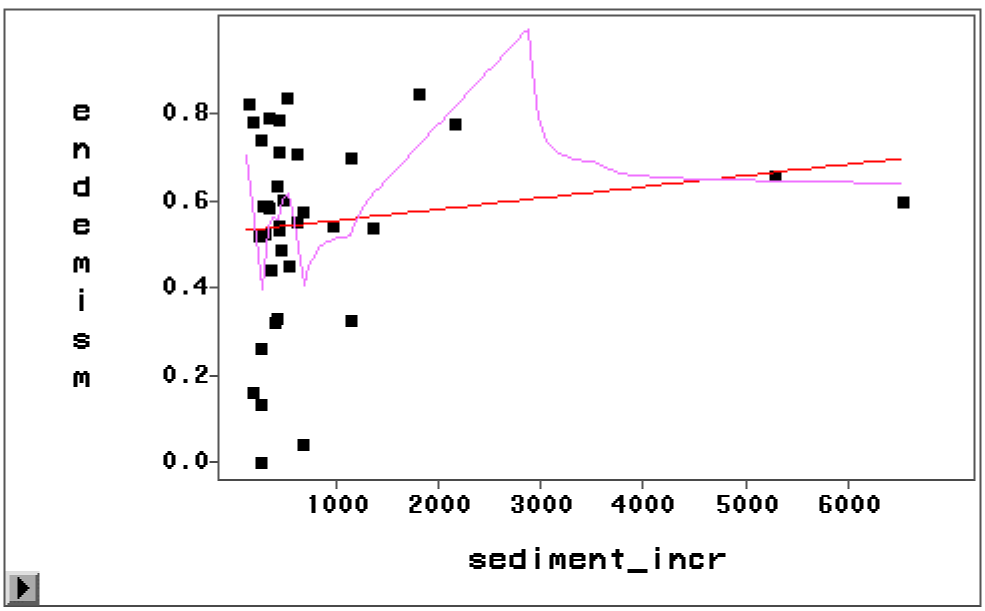

Figure B-8. Georgia Blue Ridge data with OLS regression line and LOESS regression line plotted.

Wildlife Analysis

IMI Model

To analyze the alternative prescriptions on habitat types, Andy Peavy of the Inventory and Monitoring Institute develop the IMI model. The model uses GIS data layers, Oracle, and GIS analysis to create polygon layers, attributes, and summary reports. The summary reports were used in the wildlife analysis. Details of the IMI process are in the process record.

Aquatic Species Viability Evaluation Methods

The National Forest Management Act (NFMA 1982) requires that habitat be managed to support viable populations of native and desirable non-native vertebrates within the planning area (36 CFR 219.19). USDA regulation 9500-004 (1983) reinforces the NFMA viability regulation by requiring that habitats on National Forests be managed to support viable populations of native and desirable non-native plants, fish, and wildlife. These regulations focus on the role of habitat management in providing for species viability. Populations are considered viable if there is sufficient quality, quantity, and distribution of habitat to support numbers of successfully reproductive individuals as needed to ensure that the species remains well distributed across the planning area and over time.

Aquatic habitat quality and quantity is determined by the sum interaction of natural conditions and human influences within the habitat and upstream areas within the watershed (Abell et al. 2000; Scott and Helfman 2002). For administrative purposes, watersheds are delineated and described at various scales ranging from ephemeral tributary drainages to entire river basins. Due to the nature of stream networks and the species mobility, the fifth level hydrologic unit is generally the most relevant scale for determining cumulative effects on aquatic populations. The more mobile species such as anadromous sturgeon or shad may require consideration of cumulative effects at the broader river basin and meta-population scales.

Thousands of aquatic species inhabit the 43 watersheds of the National Forests in Alabama. It is impossible determine the viability for each of these individual species. Instead, federally listed species (PET), sensitive (S), and locally rare species (R) can be used as surrogates for assessing the trends in the viability of all aquatic species. By definition, PET species are at the highest risk for loss of population viability and species extinction. Generally, sensitive species are those species that are of potential concern due to both their rarity and suspected factors in habitat loss and/or population decline. The severity of risk may range from a simple case of rarity or lack of information, to species that may warrant but have not yet received federal protection. Due to their limited distribution and low abundance, rare species may serve as an additional indicator of overall aquatic species viability and diversity. Other species with wider distribution and greater abundance are less likely to be at risk.

Species

A comprehensive list of aquatic species with potential viability concerns was compiled and is listed in the BA and BE. The list includes those species found within a five-mile perimeter of the National Forests in Alabama according to the following categories:

- Species federally listed as proposed, threatened, or endangered (PET)
- Species identified on the Regional Forester's Sensitive Species list (S)
- Species considered as locally rare on the National Forest (R)

Species Sensitivities and Watershed Stressors

Channelization, impoundment, sedimentation, and flow alterations are the most common physical habitat alterations associated with the decline of aquatic species (Walsh et al. 1995; Etnier 1997; Burkhead et al. 1997). Other human-induced impacts to aquatic species include pollution (USFWS 2000), introduced species (Scott and Helfman 2002), and over-harvesting (Miller 1989). Changes in thermal regime can also be a factor in species decline, especially for species that have evolved in the cooler and relatively constant environment of springs, sinkholes, caves, or high elevation spring-fed streams (Mettee et al. 1996). Of these stressors, four were identified as of primary biological importance and practical use in this assessment: sedimentation, point-source pollution (chemical and nutrient), alterations in water temperature, and altered stream flows (Leftwich 2003; Clingenpeel 2003).

Sensitivity to the stressors was assigned for each species based on the published literature (Terwilliger 1991; Etnier and Starnes 1993, Mettee et al. 1996, and many others, including citations in the Threatened, Endangered, and Sensitive Species section, 3.B.6.2), numerous unpublished Forest Service and contractor reports (filed in the U.S. Forest Service Supervisor's Office, Montgomery), and personal communications with species and taxa experts (Drs. Jack Feminella, Wendell Haag, Carol Johnston, Bernard Kuhajda, Ken Marion, and Melvin Warren, among others). Threats to aquatic species viability are not limited to these four variables; however, GIS coverages are currently not available for channelization, introduced species, and over-harvest. It is assumed that these four stressors adequately describe land disturbance activities in the planning area for evaluating the effects of the Forest Plan revision. Each species was rated from 0 to 5 for their sensitivity (five being the highest level of sensitivity) to four environmental stressors.

Watershed Conditions

Watershed condition was assessed using GIS based metrics representing each of the four main potential stressors (Clingenpeel 2003). The metrics were a compilation from geographic information layers, including ownership, streams, roads, point sources, dams, and land-use from the 1970s and 1990s. The metrics and combinations of data used to determine the metrics are outlined as follows:

1) <u>Sedimentation</u> -- road density, riparian road density, % forest cover, and strip mines
2) <u>Point Source Pollutants</u> -- density of point sources
3) <u>Temperature</u> -- riparian road density and % riparian forest coverage (1970s vs. 1990s)
4) <u>Altered stream flow</u> -- density of dams, riparian roads, and strip-mines (1970s vs. 1990s)

GIS based metrics were combined into single rated values potentially ranging from 0 to 5 (with five representing the best conditions, 0 the worst). In addition, a watershed condition rating was developed to characterize the condition of fifth level watersheds with respect to current and predicted sediment loads. This rating characterizes cumulative effects of sediment from private and National Forest land within a specified watershed as “excellent”, “average”, or “below average”. It also takes into account biological thresholds for sediment. Based on the literature (Scott and Helfman 2002), below average watershed condition ratings may indicate that a biological threshold for effects from sediment is being reached. Around this level of sediment impairment, endemic species have been shown to decline or disappear from southeastern watersheds elsewhere of the southeast (Scott and Helfman 2002).

Combination of Watershed Condition and Stressors

For each record of species occurrence in a given watershed, each watershed condition metric (sediment, point sources, temperature and altered flows) was multiplied against the presence (value of 1) or absence (value of 0) of species sensitivity to that corresponding stressor. Watershed condition metrics with an average or above score for point sources, temperature, and altered flows and a watershed condition rating of excellent (for sediment), are assumed to have sufficient aquatic habitat at the watershed scale to maintain species viability, and were thus categorized as “low risk” and “outcome 1”, as discussed below.

Aquatic Viability Outcomes

To evaluate aquatic habitat suitability and thus species and watershed viability concerns, selected species were related to the four environmental factors assessed in watershed analysis (point sources, water temperature, flow, and sediment). Separate viability outcomes were determined for each species in each watershed because in many cases watersheds support reproductively separate populations, and because factors affecting viability can vary considerably from watershed to watershed. Viability outcomes for each species and watershed were determined by incorporating elements of species distribution, sensitivities to environmental factors, watershed condition relative to the species’ environmental sensitivities, and the National Forest role in the watershed. Species records by each sensitivity and stressor were combined into an overall viability outcome for each species in each watershed. Outcomes with Forest Service influence were selected if any of the individual stressor viability outcomes fell in the categories of potential Forest Service influence (outcome 2 or 4). Other factors were sometimes included in this selection, such as barriers to movements, interspersion of in-holdings, and the distribution of the species within the watersheds. In this manner, the final overall viability outcome per species or watershed represents a worst-case scenario for the level of risk and a best-case scenario for the Forest Service ability to influence the ultimate outcome. Viability outcomes are defined as follows:

> Outcome 1a. Species occurs within a watershed with no apparent impairment relative to species sensitivities. Likelihood of maintaining viability is high. Risk to species is low.
>
> Outcome 1b. Species is within a watershed with some elements of impairment relative to species sensitivities. Levels of impairment are not expected to exceed theoretical biological thresholds. Therefore, the likelihood of maintaining viability is high and the risk to the species is moderate. The Forest Service could influence conditions in the watershed to keep the species well distributed and retain or improve abundance. Risk could potentially be further reduced through Forest Service actions.

Outcome 1c. Species is within a watershed with some elements of impairment relative to species sensitivities. However, levels of impairment are not expected to exceed theoretical biological thresholds. Therefore, the likelihood of maintaining viability is high and the risk to the species is moderate. Forest Service opportunity to affect outcomes for the species in the watershed is limited. Therefore, species viability in the watershed is expected to remain at a moderate level of risk regardless of Forest Service actions.

Outcome 2. Species is within a watershed with many elements of impairment relative to species sensitivities and theoretical biological thresholds. Therefore, the likelihood of maintaining viability is low and the risk to the species is high. However, the Forest Service could influence conditions in the watershed to keep the species moderately secure and risk could potentially be further reduced through Forest Service actions.

Outcome 3. Species is within a watershed with many elements of impairment relative to species sensitivities and theoretical biological thresholds. Therefore, the likelihood of maintaining viability is low and the risk to the species is high. The Forest Service ability to influence the species is limited. Therefore, species viability in the watershed is expected to remain at a high level of risk regardless of Forest Service actions.

Outcome 4. The species is so rare within the watershed (population is at very low density and/or at only a few local sites) that stochastic events (storms, drought, etc.) may place persistence of the species within the watershed at risk. Therefore, the likelihood of maintaining viability is low and the risk to the species is high. However, the Forest Service could influence conditions in the watershed to keep the species moderately secure and risk could potentially be further reduced through Forest Service actions.

Outcome 5. The species is so rare within the watershed (population is at very low density and/or at only a few local sites) that stochastic events (storms, drought, etc.) may place persistence of the species within the watershed at risk. The Forest Service ability to influence the species is limited. Therefore, species viability in the watershed is expected to remain at high risk, regardless of Forest Service actions.

Species and watershed specific viability outcomes were also summarized and evaluated, both as a relative viability risk composite for an entire species across all watersheds in Alabama National Forests, and for a PETS/rare species relative risk composite within each given watershed as follows:

Low Risk = secure to insubstantial risk to viability as indicated in the summary by absence of or minimal at-risk viability outcomes.

Moderate Risk = some level of potential risk to viability, although these may vary considerably in degree of probable severity. Indicated in the summary by the presence of some at-risk viability outcomes.

High Risk = probable risk to viability from multiple risk factors. Indicated in the summary by preponderance of at-risk viability outcomes.

Further details of the methods and assumptions used in this evaluation are available in the U.S. Forest Service process papers *Sediment Yields and Cumulative Effects for Water Quality and Associated Beneficial Uses* (Clingenpeel 2003) and *Aquatic Biological*

Resources (Leftwich 2003). Results are discussed within the Species Viability section of the EIS (section 3.B.7.2).

Management Indicator Species Selection
Process Record

Introduction

National Forest Management Act regulations, adopted in 1982, require selection of management indicator species (MIS) during development of forest plans (36 CFR 219.19(a)). Reasons for their selection must be stated. This document describes the process and rationale used to select MIS for the revised Land and Resource Management Plan for the National Forests in Alabama.

Management indicator species (MIS) are to be selected "because their population changes are believed to indicate the effects of management activities" (36 CFR 219 (a)(1)). They are to be used during planning to help compare effects of alternatives (36 CFR 219.19(a)(2)), and as a focus for monitoring (36 CFR 219.19(a)(6)). Where appropriate, MIS shall represent the following groups of species (36 CFR 219 (a)(1)):

1. Threatened and endangered species on State and Federal lists,
2. Species with special habitat needs,
3. Species commonly hunted, fished, or trapped,
4. Non-game species of special interest, and
5. Species selected to indicate effects on other species of selected major biological communities.

Since adoption of these regulations, the management indicator species concept has been reviewed and critiqued by the scientific community (Caro and O'Doherty 1999, Simberloff 1998, Noss 1990, Landres et al. 1988, and Weaver 1995). These reviews identify proper uses and limitations of the indicator species concept. They generally caution against overreaching in use of indicator species, especially when making inferences about ecological conditions or status of other species within a community. Caution is needed because many different factors may affect populations of each species within a community, and each species' ecological niche within a community is unique.

To reflect this current scientific understanding while meeting the letter and spirit of regulations, we have made great effort to clearly define the legitimate uses and limitations of each selected MIS. The MIS process is but one tool used to develop management strategies and monitoring programs designed to meet NFMA requirements related to diversity of plant and animal communities. Other elements used for comprehensive planning for plant and animal diversity include: objectives and standards for maintenance and restoration of desired ecological conditions based on knowledge of overall ecosystem structure and function; biological evaluations and assessments at both the forest plan and site-specific project levels; and evaluation of risk to species of viability concern at the forest plan level. Other elements important to monitoring effects of plan implementation on plant and animal diversity include, where appropriate, monitoring of key ecological conditions, levels of management activities important to restoration and maintenance of community diversity, species assemblages (birds, bats, fish, etc.), harvest levels of game and other demand species, and populations and/or habitats of threatened, endangered, and sensitive species.

The Selection Process

Consideration of MIS for the revised forest plan started with the current list of MIS (Table B-35) and the most recent results of population monitoring and evaluation (FY 2000 Monitoring and Evaluation Report; 2002 aquatic-riparian species viability assessment; 2002 National Forests in Alabama species database). We also reviewed region-wide lists of MIS and coordinated with other forests undergoing revision to identify opportunities for use of common MIS for common purposes. Additional species were considered under each of the five categories of potential MIS identified at 36 CFR 219.19(a)(1). All species considered were assessed using the following criteria to determine their appropriateness as MIS:

1. Changes in the species' population should primarily reflect the effects of National Forest management activities, and
2. Population trends of the species must be capable of being effectively and efficiently monitored and evaluated.

Table B-35. Management Indicator Species selected for use in the original Forest Plan and primary reason(s) for their original selection, National Forests in Alabama.

Common Name	*Scientific Name*	Primary reason(s) for original selection
Mourning dove	*Zenaida macroura*	Widespread, demand species. Species exploiting ground vegetation available in early seral habitats.
Common flicker	*Colaptes auratus*	Cavity nester using snags in early seral habitat.
Eastern bluebird	*Sialia sialis*	Cavity nester using snags in early seral habitat.
Eastern wild turkey	*Meleagris gallopavo*	Widespread, demand species, early seral grass/forb.
Northern bobwhite quail	*Colinus virginianus*	Widespread, demand species, early seral grass/forb.
Yellow-breasted chat	*Icteria virens*	Conifer shrub/seedling.
Indigo bunting	*Passerina cyanea*	Conifer shrub/seedling.
Red-cockaded woodpecker	*Picoides borealis*	T&E species, conifer sawtimber cavity dweller.
Pileated woodpecker	*Dryocopus pileatus*	Hardwood cavity nester.
Brown-headed nuthatch	*Sitta pusilla*	Conifer sawtimber, cavity dweller.
Screech owl	*Otus asio*	Conifer sawtimber, cavity dweller.
Barred owl	*Stix varia*	Cavity nester, top carnivore.
Broad-winged hawk	*Buteo platypterus*	Top carnivore in upland hardwood saw-timber.
Wood thrush	*Hylocichla mustelina*	Shrub dweller, ground level.
American redstart	*Setophaga ruticilla*	Canopy dweller, foliage gleaning.
Wood duck	*Aix sponsa*	Demand species; cavity nester.
Pine warbler	*Dendroica pinus*	Conifer sawtimber; canopy dweller; foliage gleaner.
Kentucky warbler	*Oporonis formosus*	Forest floor.
Hooded warbler	*Wilsonia citrina*	Midstory shrub dweller
Swainson's warbler	*Limnothlypis swainsonii*	Cane thickets
Gopher tortoise	*Gopher polyphemus*	Keystone species of sandhill community; T&E species
Dusky gopher frog	*Rana capito sevosa*	Management responsive & sensitive; sandhills
Seepage salamander	*Desmognathus aeneus*	"Considered sensitive to disturbance" by Mount

Table B-35. Management Indicator Species selected for use in the original Forest Plan and primary reason(s) for their original selection, National Forests in Alabama.

Common Name	*Scientific Name*	Primary reason(s) for original selection
Flatwoods salamander	*Ambystoma cingulatum*	Conifer sawtimber, “Considered endangered” by Mount; Conecuh only.
Flattened musk turtle	*Sternotherus depressus*	Rivers; mollusk eater; Bankhead only
Rice rat	*Oryzomys palustris*	Bottomland hardwoods.
Eastern gray squirrel	*Sciurus carolinensis*	Demand species; fairly widespread; hardwoods
Eastern fox squirrel	*Sciurus niger*	Demand species; fairly widespread. Cavity dweller. Mast dependant; Conifer saw-timber
White-footed mouse	*Peromyscus luecopus*	Species exploiting ground vegetation available in early seral habitats; Conecuh only.
Oldfield mouse	*Peromyscus polionotus*	Species exploiting ground vegetation available in early seral habitats; all but Conecuh.
White-tailed deer	*Odocoileus virginianus*	Widespread, demand species, shrub-seedling
Largemouth bass	*Micropterus salmoides*	Demand species; fairly widespread
Bluegill	*Lepomis macrochirus*	Demand species; fairly widespread
Redeye bass	*Micropterus coosae*	Environmental indicator for streams; Bankhead, Talladega only
Rock bass	*Ambloplites rupestris*	Environmental indicator for streams; Bankhead only
Least brook lamprey	*Lampetra aepyptera*	Environmental indicator for streams; fairly widespread
Southern brook lamprey	*Ichthyomyzon gagei*	Environmental indicator for streams; fairly widespread
Black darter	*Etheostoma duryii*	Environmental indicator for streams; Bankhead only
Brown darter	*Etheostoma edwini*	Environmental indicator for streams; Conecuh only
Gulf darter	*Etheostoma swaini*	Environmental indicator for streams; Conecuh only
Speckled darter	*Etheostoma stigmaeum*	Environmental indicator for streams; Widespread and abundant
Black madtom	*Noturus funebris*	Environmental indicator for streams; Oakmulgee, Talladega
Speckled madtom	*Noturus leptacanthus*	Environmental indicator for streams; all but Conecuh
Banded sculpin	*Cottus carolinae spp.*	Environmental indicator for streams; all but Conecuh
Rosyside dace	*Clinostomus funduloides*	Environmental indicator for streams; Bankhead only
Flame chub	*Hemitremia flammea*	Environmental indicator for streams; Tennessee Valley only
Redeye chub	*Notropis harperi*	Environmental indicator for streams; Conecuh only
Rough shiner	*Notropis baileyi*	Environmental indicator for streams; Oakmulgee, Tuskegee
Sailfin shiner	*Pteronotropis hypselopterus*	Environmental indicator for streams; Conecuh only
Silverstripe shiner	*Notropis stilbius*	Environmental indicator for streams; Bankhead, Talladega only
Pitcher Plants	*Sarracenia* spp	Management indicator for bogs, Conecuh only
Grass-pink Orchids	*Calopogon* spp	Management indicator for bogs; Conecuh only

Before examining appropriateness of individual species as MIS, some general observations about the appropriateness of some species groups can be made.

Migratory Birds — Many migratory bird species have served as MIS during the first round of forest plans. They have been retained and even highlighted as MIS in some recent plan revisions and amendments in the Southern Region. Their emphasis in MIS selection results from characteristics that make them desirable MIS: 1) Many are very specific in their habitat relationships, being tied very closely to specific vegetation composition or structure, 2) many are common and widespread in suitable habitats facilitating monitoring of population responses, 3) they are monitored relatively effectively using standardized protocols that are currently in use on all National Forests, and 4) relatively good information is available on regional and range-wide population trends, which can be used to put National Forest data into context. Yet one can reasonably argue that they are not appropriate MIS because their migratory habits result in them spending a significant portion of their lives off of National Forest land where they may be subject to many other factors that may affect their population trends. Consideration of migratory birds for MIS selection must include a balanced view of these positive and negative characteristics. Where other species are available and more appropriate for meeting the identified purpose, they should be selected over migratory birds. Where migratory birds are the best species available, they may be selected if limitations to, and strategies for, population monitoring and evaluation are clearly considered.

In general, some opportunity exists to isolate National Forest effects from other effects by comparing National Forest trends with those occurring at broader scales. Stable or increasing trends observed on National Forests while broader trends are decreasing would indicate positive effects of National Forest management, and vice versa. Similar trends documented at National Forest and broader scales, regardless of their direction, would suggest broader scale factors are prevalent. Additional limitations on monitoring bird trends have been previously documented (Gaines and Morris 1996, Linder and Buehler 2002). At current levels of funding, it is not feasible to monitor enough bird points to document trends at an individual National Forest scale with high levels of statistical precision. Current strategies are designed to document trends across National Forests at ecoregional scales. While not ideal, this approach will still allow assessment of National Forest management effects, especially where such management is similar across forests within an ecoregion, as is the case in the Southern Appalachians and Piedmont. In addition, other methods of analyzing data, such as looking at habitat associations, and frequency of occurrence within indicated habitats, can shed light on a species' response to management actions on a more local scale. We believe this meets the intent of regulations that MIS be used to indicate the effects of management on wildlife resources.

Herpetofauna — Most amphibians and reptiles do not meet the criteria of appropriate MIS because they often require a sampling effort beyond our current capability. Although some researchers make a case for salamanders as indicators of ecosystem integrity (Welsh and Droege 2001), salamander population trends in the Southern Appalachians can be particularly difficult to monitor due to the high sampling variability (Hyde and Simons 2001). Our inability to count them with precision makes inferences on relationships between population trends and habitat changes unreliable and difficult. The Forest Service is working closely with cooperators to improve, develop, and standardize survey protocols for both amphibians and reptiles so that effective monitoring programs can be established and expanded. However, at this point, inherent limitations to monitoring this group make them generally ineffective as MIS.

Plants — Plants can serve as effective indicators of specific habitats and conditions. Many are well documented for their responsiveness to forest management activities, both positive and negative. Species that are fire-dependent, or highly associated with specific successional stages, can be particularly effective as MIS. Plants are often capable of being effectively monitored due to their immobility. The monitoring precision necessary varies with the purpose of the MIS selection, but in many cases, high precision is not needed to show population response to management activities. However, often monitoring of overall plant community composition provides better information on management effects, than does focus on one or a few species. Plant communities filling this purpose are discussed in the Rare Plants and Woodlands, Savannas and Grasslands sections of the EIS.

Terrestrial Invertebrates — Terrestrial invertebrates are generally deemed inappropriate as MIS because monitoring protocols are not well developed for most species, and little is known of their habitat relationships. Their populations also tend to fluctuate widely due to unknown factors.

The remainder of this paper documents consideration of the appropriateness of species as MIS by category as listed at 36 CFR 219 (a)(1).

1. Threatened and Endangered Species

Species within this category are identified as threatened or endangered on state or federal lists. They are selected to focus attention on species with viability concerns whose population levels are directly tied to effects of National Forest management. These species already receive attention during planning and monitoring by virtue of their status under the Endangered Species Act, Forest Service sensitive species policy, and NFMA viability regulations. Therefore, designation of species from this category for coverage by MIS requirements is in many ways redundant. Our consideration of MIS status for species within this category was focused on identifying those species whose population trends and continued existence are especially dependent on National Forest management activities.

Bats — The most high-profile bat species in this category are the Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*). An important effect of National Forest management on populations of these species is protection of caves used for roosting and hibernation. Bat population monitoring within these caves is currently conducted. However, because bat populations disperse widely (beyond National Forest boundaries) during non-hibernation seasons, little is known about their movements and factors limiting populations. Changes in populations documented through cave counts reflect all of these other factors, which are not necessarily associated with National Forest management. In addition, other than cave counts, monitoring bat population trends is not feasible due to technical limitations in sampling free-ranging bats. For these reasons, bats are deemed not appropriate as MIS. However, they will continue to be addressed in environmental effects documents at both the forest plan and site-specific project levels, and be the focus of cave counts and forest-wide inventory efforts.

Bald Eagle (*Haliaeetus leucocephalus*) — This species is deemed not appropriate as an MIS due to its wide ranging movements and the transient nature of its use of the National Forest. Because bald eagles spend much of their time off the National Forest, it would be difficult to associate population trends with National Forest management activities. Monitoring of bald eagles, as a T&E species, will continue.

Wood Stork (*Mycteria americana*) — This species is also deemed not appropriate as an MIS given that most of its life history is spent off the National Forest. It would be difficult to associate population trends with National Forest management activities. Monitoring of the wood stork, as a T&E species, will continue.

Red-cockaded Woodpecker (*Picoides borealis*) — The RCW is perhaps our most appropriate T&E species to be selected as an MIS. It is highly responsive to habitat changes induced through active forest management. It is also easily and effectively monitored, using long-established and consistent protocols. It is selected as an MIS to indicate effects of National Forest management on its recovery. It also serves as an indicator of effects of management on mid- and late-successional pine and pine-oak forest communities (see discussion below).

T&E and Other Rare Salamanders — As discussed previously, these species are generally not effective MIS due to their high population variability, the influence of moisture on their detectability, and the difficulty in relating population changes to management effects. Efforts to monitor T&E and other rare salamanders will continue or be expanded as the effectiveness of techniques is validated, but designating them as MIS is not appropriate at this time.

T&E and Other Rare Fish — Stream and riverine fish are deemed inappropriate as MIS because sampling variability is high, making determination of trends difficult. In addition, their sensitivity to habitat changes arising from off-forest influences, as well as their ability to move between private and National Forest lands in many cases, make it difficult to attribute population changes to National Forest management activities. However, monitoring of T&E and other rare fish species will continue as part of a comprehensive and community-based stream-monitoring program. (See additional discussion in following sections.)

Mussels — Mussels are also deemed inappropriate as MIS because of the difficulty inherent in monitoring trends and attributing population changes to management activities on National Forests. Mussels are greatly dependent on high water quality, which is influenced by the cumulative effects of activities originating on private as well as National Forest lands. However, as with other T&E species, inventory and monitoring of mussels will continue.

Rare Plants — Many T&E and rare plants require only protection of known locations. Because their populations do not primarily reflect effects of management activities, they are often ineffective as MIS. However, in some cases, specific management actions have been designed to affect T&E or other rare plant, or rare community populations. Rare plant communities in the Coastal Plain, and the transitional areas of the Ridge and Valley, Piedmont, and Cumberland Plateau are known to be highly associated with, or responsive to, forest management activities which reduce tree cover and restore historic disturbance patterns (Walker, 2001). However, there are not any federally listed species that can also serve the function as indicators of fire related management activities within the National Forests in Alabama. T&E plant species will continue to be monitored but will not be listed as MIS. Pitcher plants (*Sarracenia* spp.) and grass pink orchids (*Calopogon* spp.), previously listed as MIS under the category of viability concern, will no longer be listed as MIS. Both of these species groups are found in bogs, one of the rare community types. Therefore, these species are protected on the forest from habitat manipulations that might negatively affect their populations. Regardless of the MIS designation, population monitoring of these species will continue.

2. Species with Special Habitat Needs

Species under this group are closely dependent on special habitat elements that may be affected by National Forest management. They are considered for selection because they may help us document the effects of management on these special habitat elements.

Snag dependents — The pileated woodpecker (*Dryocopus pileatus*) is selected as an MIS because it requires large snags for nesting and feeding. The occurrence of this species may be correlated with forested habitats containing abundant large dead trees and fallen logs (Hamel 1992), which also are used by other woodpeckers, owls, and numerous other birds, mammals, and amphibians. This species is selected to help indicate the effects of management activities on the availability of forests with desired abundance of snags. Its use as an indicator is limited by its wide-ranging habits, which causes it to be documented in forest types that are not particularly suitable. It also occurs at relatively low densities, reducing the number of data points available for trend estimates. Local analysis would therefore be limited; analysis in regional trends across National Forests would provide more analytical power. Population monitoring would be combined with information on forest age-class distribution and snag densities to provide a full picture of management effects on this species and other snag-dependent wildlife.

Hard mast dependents — The gray squirrel (*Sciurus carolinensis*), although the species most closely associated with hard mast capability, is an ineffective indicator of the quality or abundance of these habitats. This ineffectiveness is because its populations fluctuate greatly even in good habitats in response to annual variability in mast production, which is primarily due to weather. Other species such as bear, deer, and turkey benefit from hard mast production, but their population trends also reflect a variety of other factors, including habitat interspersion and hunting harvest. Acres of mature oak forest is a more useful and direct indicator of trends in hard mast production capability, and therefore will be used to indicate effects to mast dependent species instead of an MIS.

Mature forest interior dependents — Concern over forest interior habitats is primarily focused on effects to migratory birds. Several bird species are associated with forest interior. The wood thrush (*Hylocichla mustelina*) is deemed the most appropriate of these as an MIS for National Forests in Alabama. It is strongly associated with mature forest interior habitats (Hamel 1992, Crawford et al. 1981), and is also common enough to be feasibly monitored for trends. Long-term monitoring of this species has resulted in some of the most robust data sets of any of the interior bird species surveyed on the forest. This species is selected to help indicate the effects of management on the availability of suitable mature forest interior habitats. Other elements, such as landscape analysis of forest fragmentation using remote sensing data, would supplement information received from monitoring this species.

Mature riparian forest — The Acadian flycatcher (*Empidonax virescens*) is deemed the most appropriate species to indicate management-induced changes to mature riparian forests. It is highly associated with mature deciduous forests along streams and bottomland hardwoods, which it uses for feeding and reproduction (Hamel 1992). It is also effectively monitored using proven, consistent protocols. It is relatively common in these habitats, providing enough data for evaluation. This species is selected to help indicate the effects of management activities on mature riparian habitats. Salamander species, although often associated with this habitat, are not particularly effective MIS for reasons described previously.

Early-successional riparian areas — The importance of distinguishing MIS for early seral riparian habitats is most apparent in the southern latitudes of Alabama forests, especially the ridge and valley, piedmont, and coastal plain regions. The Swainson's warbler (*Limnothlypis swainsonii*) is most appropriate to represent early-successional riparian habitats. It is strongly associated with canebrakes, tangles, and thick shrubby understories of open bottomland hardwoods and mixed forests (Hamel 1992). In some situations, it may be uncommon, making trend analysis difficult. Its populations would primarily be evaluated based on presence or absence in targeted habitat types. This species is selected to help indicate the effects of management activities designed to favor wildlife communities that rely on early-successional riparian areas.

3. Species that are Hunted, Trapped, and Fished

Species considered under this category include deer, turkey, quail, fish, and other harvestable species that are in high public demand for consumptive uses. Demand MIS are used to help assess effects of management on meeting this demand on National Forests. Drawing inference about the effect of National Forest management on these species is difficult, because, in large part, their populations are regulated through harvest regulations by the state fish and wildlife agencies. Nevertheless, species in this group may be appropriate as MIS where the role of harvest regulation and demand can be evaluated along with habitat trends. This situation will normally occur where state fish and wildlife agencies collaborate in monitoring efforts.

Demand Wildlife - White-tailed deer are habitat generalists. Areas with high habitat diversity will most often be higher quality deer habitat. Since a single forest type or condition rarely provides all of a deer's habitat requirements, habitats can be improved for deer by using timber harvest, prescribed fire, and/or agricultural food plots to increase habitat diversity (Miller, 2001). Eastern wild turkey habitat utilization is as varied as that of white-tailed deer. Turkey brood, or poult survival and movements are affected by weather and vegetation characteristics. The quantity, quality, and availability of food, and its structure and arrangement all determine what food and cover are available to broods (Hurst 1992). Herbaceous openings, producing large numbers of insects for food, are especially important to turkey broods, and thus turkey populations (Dickson 2001); although, mature riparian forests, mast producing forests, and remote habitats are also utilized by turkeys. Since their habitat utilization is so similar, white-tailed deer may be used as a surrogate of Eastern wild turkey suitable habitat trends, however harvest regulation does vary between the species. Hunting demand for both of these species is very high in Alabama (Miller, Dickson 2001). Therefore, both white-tailed deer and Eastern wild turkey are selected as indicators of the effects of management to meet the hunting demand for these species.

There is demand for Northern bobwhite quail hunting opportunities in Alabama. National Forests in Alabama are the largest public hunting areas in the state. Northern bobwhite quail are declining throughout their range according to North American Breeding Bird Survey data. In the southeast, as quail populations have declined, hunter participation has also decreased. Management activities and programs that create bobwhite habitat, and contribute to population increases, will likely reduce hunter attrition, increase hunter recruitment and generate economic activity and demand associated with quail hunting (Burger 2001). Several management objectives of the revised plan will produce peripheral habitat improvement for Northern bobwhite quail. Therefore, Northern bobwhite quail are selected as indicators of the effects of management to meet the hunting demand for this species.

Fish - Alabama game fish populations are usually maintained by intense and focused management activities largely under the control of the State (stocking and fertilization). Much of the stocking program is for catch-able sized fish. Populations fluctuate from year to year and between sites depending on budgets and forces beyond FS influence. Stocked game and pan fish are therefore not indicative of Forest Plan implementation and effects on environmental conditions. Such species are better tracked through project and program level monitoring in coordination with the State.

Furbearers — Common species of furbearers found on National Forests are fox, bobcat, raccoon, mink, otter, and beaver. As a group, these species were judged not appropriate for selection as MIS for several reasons. Consumptive demand for furbearers on the National Forest is not large. These species are typically habitat generalists, making evaluation of relationships to habitat changes difficult. In addition, they generally are wary, often occur at low densities, and therefore are not feasible to monitor with precision.

4. Non-game Species of Special Interest

Species considered under this category are those for which there exists special public interest for non-consumptive reasons. They may be selected for the purpose of focusing assessment on such species when management is expected to have a major influence on their populations. Public interest in non-game species is typically generalized, rather than focused on one or a few species (e.g. interest in wildflowers, birds, and other wildlife for viewing or nature study). Interest in any one species is not sufficient to drive MIS selection, beyond those species already selected under other categories. Those species cover the special interests that are to be considered under this category.

5. Species That Indicate Effects to Major Biological Communities

Species considered under this category are those whose populations respond to management-induced changes in key ecological conditions within a community. These ecological conditions should be important to other members of the community as well. Selection of MIS under this category is to help focus attention on maintenance and restoration of desired conditions within major biological communities.

Rare Communities — By definition, rare communities are small and discrete habitats that are uncommon on the landscape. Because of their rarity and importance to providing for a diversity of plant and animal communities, each occurrence will be monitored directly.

Monitoring will focus on the maintenance of desired conditions including presence of associated species. Because monitoring will be done directly, no MIS are selected for these communities.

Mid- and Late-Successional Mesic Deciduous Forest — The hooded warbler (*Wilsonia citrina*) is selected as an MIS for mid- to late-successional mesic deciduous forests. It is more common and widely distributed than the cerulean warbler. Northern Alabama represents the southern limit of cerulean warbler breeding distribution. Cerulean warblers are currently only known to breed on the Bankhead National Forest. Like the cerulean warbler, the hooded warbler is heavily associated with bottomlands and moist deciduous forests with fairly dense under-stories, where it breeds and feeds (Hamel 1992, Crawford et al. 1981). Management opportunities exist to increase the structural diversity of closed canopied habitats in this type to favor species, such as the hooded warbler, that optimize their life history in forests with canopy gaps and patches of dense understory. This species is deemed appropriate for helping to indicate the availability of mid- and late-successional mesic deciduous habitats and the efficacy of management intended to favor its habitat.

The cerulean warbler (*Dendroica cerulea*) was not previously an MIS for any management unit of the National Forests in Alabama, because breeding territories are especially associated with canopy gaps within southern Appalachian forests. The northernmost management unit of National Forests in Alabama (Bankhead) is the only known unit with breeding populations of cerulean warbler. It likely represents the southernmost extent of the species' breeding range. This species is identified in the National Strategic Plan as an emphasis species and will be monitored on the Bankhead National Forest, but not as an MIS. It is not an effective MIS because it is extremely rare on the Forest and is not effectively monitored using standardized point count protocols. Consequently, trend analysis is not feasible. Cerulean warbler populations would primarily be evaluated based on presence or absence in targeted habitat types or in response to experimental habitat treatments. Monitoring for this species will focus more on verifying occurrence location data rather than determining population response to management activities.

Mid- and Late-Successional Hemlock-White Pine Forests — Native communities of this type are primarily located along streams and stream terraces. Management direction is to protect these forests; little active management is planned. These forest types only exist on the Bankhead National Forest in National Forests in Alabama, where it makes up only 1% of the forest's area. On Bankhead National Forest, these forest types are associated with canyons and ravines that are usually in the Canyon Corridor prescription. The prescription was created to emphasize protection of these areas from management activities. Therefore, no MIS is selected for this community.

Mid- and Late-Successional Oak and Oak-Pine Forests — Because of their wide distribution across moisture gradients, mid- and late successional oak and oak-pine forests support a wide variety of species. Hooded warblers, selected as MIS for mid- and late-successional mesic deciduous forests, adequately represent mesic oak forest communities. This species is expected to respond positively to management actions (including thinning and moderate frequency burning) that are designed to stimulate advanced oak regeneration and perpetuation of the forest type on these mesic sites. Drier oak forests support a different mix of species. To represent this upland oak community, the scarlet tanager is selected as an MIS on the Bankhead National Forest and the Talladega Division. This species is most abundant in upland mature deciduous forest (Hamel 1992). Trends for this species will be evaluated along with trends in total acres, age-class distribution, and levels of restoration and maintenance activities in this forest type to provide a more complete picture of effects of management on this community. On the remaining management units on the National Forests in Alabama (Oakmulgee, Tuskegee, and Conecuh), hardwood forests types are confined to mesic habitats by the effects of fire and natural disturbance patterns on the landscape. Pine and pine-hardwood forest types dominate the drier, upland sites in the upper and lower coastal plain, where the frequency of both natural and anthropogenic fires limits hardwood distribution. The exception to this is the Dry and Xeric Oak communities (57-Scrub Oak Forest Type). This community comprises less than one percent of the Conecuh National Forest, and is not the object of direct management. No MIS is needed for upland oak communities in the upper or lower coastal plain management units.

Mid- and Late-Successional Pine and Pine-Oak Forests — The red-cockaded woodpecker is selected as the MIS for mid- and late-successional pine and pine-oak forests on the Talladega and Conecuh National Forests. Bankhead and Tuskegee National Forest red-cockaded woodpecker populations were extirpated through a loss of suitable habitat. In addition to being a T&E species, the red-cockaded woodpecker is a good indicator of the desired conditions for this community type. The red-cockaded woodpecker's association with open, park-like, fire-maintained stands makes this species the most appropriate indicator for mid- and late-successional pine and pine-oak forests, when present.

The brown-headed nuthatch (*Sitta pusilla*) is selected as an MIS for mid- and late-successional pine and pine-oak forests for the Bankhead and Tuskegee National Forests. As a cavity-nesting species heavily associated with pine forests, it is a good indicator of mid- and late successional stages of this community type. Its favorable association with the conditions created by effective prescribed burns (Hunter et al. 1992), also make this species an indicator of the effectiveness of management on mid- and late-successional pine and pine-oak forests

Woodlands, Savannas and Grasslands — Historic woodland, savanna, and grassland communities on National Forests in Alabama will be the focus of restoration efforts involving reducing tree cover and restoring periodic fire. Over time, these activities are expected to create grass-dominated understories. Beyrich's threeawn (*Aristida beyrichiana*, formerly *Aristida stricta*), little bluestem (*Schizachyrium scoparium,*) and broomsedge bluestem (*Andropogon tenarius* & *A. virginicus*) are some of the native, warm-season grasses adapted to open habitat and conditions associated with frequent fire. There are several sensitive species known to occur on National Forests in Alabama that also require open, fire maintained habitats, including the federal Candidate species, Georgia aster (*Aster georgianus*), milkweeds (*Asclepias* spp.), and pitcher plants (*Sarracenia* spp). Only the milkweeds are widely distributed across the five management units of National Forests in Alabama. Still, community-level monitoring for the development of an herbaceous understory, better reflects restoration of woodland conditions. Georgia aster is too infrequent to be an effective MIS. Pitcher plants occur in coastal plain bogs, a rare community, which will be directly monitored, as described in this document. Fire-associated species such as the milkweeds and native warm-season grasses will be monitored in the terms of their relative abundance to determine when woodland structure has been restored. Historically, and in well-managed landscapes, these species can be found scattered widely throughout the herbaceous understory. There is no specific overstory associated with these species, since they may occur abundantly in open xeric hardwoods, mixed hardwood/pine and open pine communities as well as those listed above. Little bluestem can be found on every unit. Beyrich's threeawn is found on the Conecuh. The broomsedge species are divided between the northern and southern units, with overlap on the Oakmulgee, Shoal Creek & Talladega units. No individual management indicator species are chosen for woodlands, savannas, and grasslands; instead a community-level, structural assessment will be used to determine restoration achievement, and in concert with overstory density, woodland condition.

Early-Successional Forest — The prairie warbler (*Dendroica discolor*) is selected as the most appropriate MIS to represent early-successional forests. Prairie warblers are shrubland nesting birds that require dense forest regeneration or open shrubby conditions in a forested setting. Near optimal habitat conditions are characterized by regeneration, thinned area or patchy openings 10 acres or more in size where woody plants average 2 to 3 meters in height, 3 to 4 cm dbh, and occur in stem densities around 3000 stems/acre (Natureserve 2001). Therefore, to help indicate management effects on creating and maintaining early successional forest (low elevation) communities and other early successional habitats, prairie warblers are chosen as MIS for early-successional forest. Prairie warbler populations respond favorably to conditions created 3 to 10 years following forest regeneration in larger forest patches (Lancia 2000). Providing a sustained flow of regenerating forests is necessary to support populations of this species.

Old Growth — Because most species associated with old growth conditions are found in late-successional forests, separate indicator species were not selected for old growth successional stages. Late-successional indicator species as indicated in this document would be monitored in both late-successional and old growth habitats. Abundance of old growth habitats would be monitored separately to allow evaluation of trends in availability of this habitat condition.

Aquatic Communities—A community-based monitoring approach will be used to assess aquatic habitats, in lieu of designating individual MIS. These approaches look at community composition as an indication of the integrity of aquatic communities. A focus on community composition reduces the variability inherent in looking at an individual species, and thus, provides more accurate information on the status of the community and the health of aquatic systems. In addition, in compliance with the Endangered Species Act, the National Forests in Alabama track population and habitat trends for over 21 federally listed aquatic species. The combination of both ESA required threatened and endangered species monitoring and community-based monitoring will be more than adequate to assess effects of Forest Plan implementation. Therefore, no individual MIS are selected to represent aquatic communities.

Summary

Twelve species have been selected as management indicator species for the revised Forest Plan (Table B-36). They will be used to compare Forest Plan alternatives and to help monitor effects of implementing the selected alternative.

Table B-36. Management Indicator Species selected for use in the revised Forest Plan and primary reason(s) for their selection, National Forests in Alabama.

Common Name	Scientific Name	Applicable Management Units	Primary reason(s) for selection
Red-cockaded woodpecker	*Picoides borealis*	Conecuh Oakmulgee Div. Talladega Div.	To help indicate management effects to mid- and late- successional pine and pine-oak forest
Pileated woodpecker	*Dryocopus pileatus*	All	To help indicate management effects on snag dependent wildlife species.
Wood thrush	*Hylocichla mustelina*	All	To help indicate management effects on wildlife species dependent upon mature forest interior conditions
Acadian flycatcher	*Empidonax virescens*	All	To help indicate management effects within mature riparian forest community
Swainson's warbler	*Limnothlypis swainsonii*	All	To help indicate management effects within the early successional riparian forest community.
White-tailed deer	*Odocoileus virginianus*	All	To help indicate management effects on meeting hunting demand for this species.
Eastern wild turkey	*Meleagris gallopavo*	All	To help indicate management effects on meeting hunting demand for this species.
Northern bobwhite quail	*Colinus virginianus*	All	To help indicate management effects on meeting hunting demand for this species.
Hooded warbler	*Wilsonia citrina*	All	To help indicate management effects on mesic deciduous forest and mesic oak and oak-pine forest communities
Scarlet tanager	*Piranga olivacea*	Bankhead Talladega Div.	To help indicate management effects on xeric oak and oak-pine forest communities
Brown-headed nuthatch	*Sitta pusilla*	Bankhead Tuskegee	To help indicate management effects on the pine and pine-oak forest community
Prairie warbler	*Dendroica discolor*	All	To help indicate management effects on creating and maintaining early successional forest (low elevation) communities and other early successional habitats

Several categories of habitats will be monitored directly to more exactly assess management effects and to replace the management indicator species concept in these cases (Table B-37). Justification for this approach can be found in the preceding discussion. These direct counts of acres will be supplemented by community-based monitoring (described below and in Table B-38) to assess multiple species trends and overall habitat and ecosystem conditions.

Table B-37. Categories of habitats that will be monitored directly.	
Common Name	**Primary reason(s) for selection**
Acres of Mature Oak Forest	Indicator of hard mast production and management effects on mast dependent species.
Acres of Early Successional Riparian Habitat	Indicator of available early seral riparian habitats and management effects on availability of early seral riparian habitats.
Acres of Rare Communities	Indicator of the amounts and trends of restored or protected rare communities and management effects on rare communities.
Acres of Mid- and Late-Successional Hemlock and White Pine Forest	Indicator of the amounts and trends of mid- and late successional hemlock and white pine forest and management effects on mid- and late successional hemlock and white pine forest.

Community level monitoring efforts will be conducted to complement or replace the need for management indicator species (Table B-38). In many situations, community-based monitoring is the most effective indicator of multiple species trends and overall habitat and ecosystem conditions.

Table B-38. Alternative approaches to management indicator species as selected for use in the revised forest plan and primary reasons for their selection, National Forests in Alabama.	
Common Name	**Primary reason(s) for selection**
Landbird Monitoring	Responsive to management and indicative of multiple species and overall habitat conditions.
Aquatic communities	Responsive to management and indicative of multiple species and overall habitat conditions.
Rare plant communities	Responsive to management or protection, depending on the community. Indicative of multiple species and overall habitat conditions.

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Recreation

NVUM

Expenditure Data: Recreation and Wildlife and Hunting trips were derived from the National Visitor Use and Monitoring survey (NVUM) that is done for one-quarter of National Forests each year. For those forests that have not been surveyed, as is true for the National Forests in Alabama, data from a surveyed Appalachian forest served as proxy data, and adjustments were made by forest personnel based on pre-NVUM work for our forest. The resulting calculations yielded trips for resident and non-resident Day, On National Forest Overnight use, and Off National Forest Overnight Use. These use metrics were entered into FEAST to link with IMPLAN impact response coefficients to yield an impact for recreation and wildlife and hunting resources.

While some analysts may not include resident participation in local economy impacts because there may be substitution opportunities for local residents to spend their discretionary dollar, we decided to include resident expenditures in the local economy with the caveat that these expenditures were “associated” with the impacts not “responsible” for causing impacts.

Scenery

This planning process implements the new Scenery Management System (SMS). The existing Visual Quality Objective Maps (VQOs), as revised in 1992, were used as a basic scenery inventory. Sensitivity levels as described in the visual management system were cross-walked into concern levels as described in the scenery management system. Variety classes as described in the visual management system were cross-walked into scenic attractiveness levels of distinctive (A), typical/common (B), or undistinctive (C) as described in the scenery management system. Distance zones remained essentially consistence with the existing inventory. At this point in the process, during public meetings, citizens were invited to recommend places that should have a higher concern levels and agency personnel reviewed the inventory for accuracy. After correcting the inventory based on public and internal input, the analysis proceeded. The scenic class matrix was then prepared by contrasting distance zones and concern levels on one axis with scenic attractiveness levels (A, B, or C landscapes) on the other axis. This matrix when applied to the land gave a scenic class assignment to every acre. Next the scenic integrity objective (SIO) matrix was prepared. The SIO matrix was then prepared by contrasting the applied management prescriptions on one axis with the assigned scenic class on the other axis. This matrix when applied to the land gave a SIO assignment to every acre. The actual GIS analysis used in this process is described below.

Scenic Integrity Objective Coverage Process

- Define the Geographic Information Systems (GIS) Scenic Management Systems (SMS) coverage to show all scenic classes greater than 0.

- Union the SMS coverage that contains the scenic class values with the official Prescription coverage, which contains the prescriptions applied. Name the Scenic Integrity Objective (SIO) coverage 'sio_distict_name'.

- Run the modified 'adopted_sio_byrx.aml' developed by Karen Goode of George Washington and Jefferson National Forests.

- The following functions are performed using the 'adopted_sio_byrx.aml':

    - Nine fields created in the new SIO coverage and named 'sio_alternative xx' (i.e. sio_a, sio_b, sio_c, etc.)

    - Coverage queried based on scenic_class and prescription values and newly created fields populated with the appropriate SIO values. These values are derived from the scenic integrity matrix incorporated into the 'adopted_sio_byrx.aml'

- Re-calculate the acres field for the new coverage.

- Perform this process for each district on the forest.

Changes to the Spectrum Model Between Draft and Final EIS

No changes were made to the Spectrum model between the Draft EIS and the Final EIS.

Appendix C
Evaluation of Roadless Areas

Blue Mountain Wilderness Evaluation

Solitude:

Blue Mountain Roadless Area consists of an approximately 4,801-acre land base on the Talladega and Shoal Creek Districts of the Talladega National Forest. Topography of the area may be described as mountainous with a highly dissected and broken terrain. Slopes are moderately steep over the most part, but in places terrain may become very steep. Narrow finger ridges and steep drainages characterize the area, with the narrow Blue Mountain ridge being the predominant topographic feature of the area.

The eastern boundary of the Blue Mountain Roadless Area is formed by the Talladega Scenic Drive. The Talladega Scenic Drive is a paved road and is the primary access route to Cheaha State Park. Traffic volume on the Scenic Drive ranges from low to very high, depending on the season and day of the week. Noise from vehicles traveling on the Scenic Drive can be heard inside the Blue Mountain Roadless Area, but the topography of the area mitigates this noise somewhat. On the west side of Blue Mountain, a sense of solitude may be found by hikers on the Pinhoti Trail. Although opportunities for solitude may be found in various areas throughout the Blue Mountain Roadless Area, this west side of Blue Mountain is more remote and opportunities for solitude are greatest in this portion of the Roadless Area.

The Pinhoti National Recreation Trail passes from north to south through the area, and in terms of road access, this section of the Pinhoti is the most remote non-wilderness section to be found on the Talladega National Forest.

The majority of the boundaries of the Blue Mountain Roadless Area fall along interior lines, that is, the adjacent land is in Forest Service ownership. An L-shaped boundary of approximately two miles of the Roadless Area is adjacent to Cheaha State Park. Visitation to this State Park is seasonally heavy, but current development of the park's facilities adjacent to the Roadless Area reflect a natural setting that tends to blend with the forest environment. Just over ½ mile of boundary, or approximately 3 percent of the total boundary, falls along privately owned landlines. The influence of these lands will likely be limited to the immediate area surrounding the boundaries. However, if these private lands become residential developments, the influence upon solitude will extend further into the Roadless Area.

The Oxford-Cheaha Road dissects the Blue Mountain Roadless Area, primarily from northwest to southeast. This closed road receives some recreational use, primarily by local people. The focal point of most of the use is the Civilian Conservation Corps

(CCC) constructed bridge at Hillabee Creek. Evidence of this use may be found at the bridge, but overall use of the Oxford-Cheaha Road is considered light.

Natural Appearance:

The Blue Mountain Roadless Area is primarily a natural appearing landscape over most of the area. The one major exception to this is the Oxford-Cheaha Road. The Oxford-Cheaha Road dissects the Roadless Area and in terms of appearance should be considered a developed road. The Oxford-Cheaha Road demonstrates an obvious road prism and is of a width sufficient for the passing of two automobiles. Road construction improvements built by the Civilian Conservation Corps provide excellent examples of stone workmanship and include rock culverts, towering rock retaining walls, and a stone arched bridge across Hillabee Creek. The planning and workmanship of these road structures represent a superb example of blending with the natural environment, but are obviously constructed features on the landscape. In addition to the Oxford-Cheaha Road, there are a number of unimproved roads throughout the area. The more highly developed of these unimproved roads are in the portion of the Blue Mountain Roadless Area that is north of the Oxford-Cheaha Road.

The Pinhoti National Recreation Trail is open to hiking only. The Pinhoti is a narrow trail with an earthen tread and presents little impact on the natural appearance of the landscape. A few trail directional signs made of native materials are found on the Pinhoti and the route through Blue Mountain is blazed.

The percentage of the area in non-native vegetation is less than one percent and is primarily limited to watershed restoration work. There have been very few Southern Pine Beetle outbreaks in the area in the last few years (about three acres total) and no recent timber harvests. There is still evidence along the Pinhoti Trail between the Oxford-Cheaha Road and the Bald Rock spur of a major wildfire that occurred in the early 1980s. The last prescribed fire dates back to 1997. This fire on the east side of the ridge was set from the Oxford-Cheaha Road and burned north to past the electric transmission line. These activities have not created a significant permanent impact on the natural appearance of the landscape.

Geological Strata:

Blue Mountain is a part of the Southern Appalachian Mountains, which contain some of the highest elevations found in Alabama. The Blue Mountain Roadless Area contains mountain longleaf and shortleaf pine trees and other xeric vegetation. Blue Mountain contains meta sandstone and slate rock outcroppings and was once a source of iron ore and other minerals.

Biological Strata:

Rare communities and habitat associations of the Blue Mountain Roadless Area include mountain longleaf, mixed shortleaf/longleaf, open pine hardwood, riparian zones, loblolly flats, cliff faces, mesic hardwood, xeric oak/pine ridge tops, and talus slopes. Possible rare communities and habitat associations for the Blue Mountain Roadless Area includes springs, seeps, glades, rocky barrens cert/limestone formations, and mesic basic forests.

The Blue Mountain Roadless Area contains: approximately 28 acres of Loblolly Pine-Hardwood stands, approximately 175 acres of Virginia Pine-Oak stands, approximately 106 acres of Longleaf Pine stands, approximately 170 acres of Yellow Pine stands, approximately 226 acres of Loblolly Pine stands, approximately 688 acres of Virginia Pine stands, approximately 552 acres of Chestnut Oak-Scarlet Oak-Yellow Pine stands, approximately 17 acres of White Oak-Black Oak-Yellow Pine stands, approximately 568 acres of White Oak-Northern Red Oak-Hickory stands, and approximately 367 acres of Yellow Poplar-White Oak-Northern Red Oak stands. Approximately 465 acres of the Blue Mountain Roadless Area are not inventoried.

Ecological Strata:

Land type associations for the Blue Mountain Roadless Area are from the Southern Ridge and Valley Section, and the Quartzite and Talladega Slate Ridge subsection. This land type association is currently represented in the Cheaha Wilderness. The geologic age of the Roadless Area is from the Silurian-Devonian period and the soil parent material is primarily sandstone with some shale.

Stand ages for the Blue Mountain Roadless Area date from 1886 to 1987. There are approximately 268 acres in the 11 to 30 age class, approximately 650 acres in the 31 to 60 age class, approximately 1,324 acres in the 61 to 80 age class, 33 acres in the 81 to 100 age class and approximately 622 acres in the over 100 year age class. Approximately 465 acres are not inventoried. There are no designated botanical or zoological areas in either of the Roadless Areas.

Scientific/Educational Values:

There are no Research Natural Areas or Experimental Areas inside the boundaries of the either of the Roadless Areas.

Historical/ Social/Cultural Values:

There has been one archeological survey conducted in the Blue Mountain Roadless Area. This survey, conducted for the proposed Hillabee Creek Watershed Analysis in 1997, contained approximately 900 acres in compartments 81, 82, and 84, which are in the Blue Mountain Roadless Area. No archeological sites were located within the Blue Mountain Roadless Area. However, the Oxford to Cheaha CCC Road, which was designated as a historic resource rather than an archeological site, is located within the Roadless Area. The CCC Road, built by the Civilian Conservation Corps in 1933 and 1934, was later designated as Forest Service Road 589. The CCC Road consists of a series of native stone retaining walls and culverts. A stone arch bridge

was built across Hillabee Creek. The CCC Road is currently being studied as a National Register Historic District.
Additional archeological sites can be expected on ridge saddles, on any benches or other level upland landforms, and on terraces overlooking the drains in the area.

The land within the Blue Mountain Roadless Area was acquired by the federal government from various landowners beginning in the late 1930's. The previous landowners included large corporations, such as the Alabama Mineral Land Company, and smaller individual owners of 160, 80, and 40-acre tracts. Evidence of the historic settlement of the area should include sites associated with large logging operations and small homesteads.

Challenge:

Due to the size of the area and the nature of the topography, the Blue Mountain Roadless Area does provide some opportunity to experience a moderate degree of outdoor risks. These risks will increase with the lack of preparedness, such not packing the proper clothing, food, or water for a trip into the Area. Travel off of the Pinhoti Trail or the Oxford Cheaha Road would require the use of compass and map reading skills. The Roadless Area is of sufficient size and topography for a visitor to become lost without the use of these basic outdoor skills. However, under normal conditions, it is unlikely that becoming lost in the Blue Mountain Roadless Area would become a life-threatening event. The presence of the Cheaha State Park, the Talladega Scenic Drive, the Oxford Cheaha Road, and the power transmission line on the north boundary tends to reduce the opportunities for life-threatening conditions to overcome a lost visitor. In addition, the relatively narrow character of the Roadless Area would allow the visitor to walk out of the Roadless Area or to some developed travel way by following a drainage downstream for a relatively short distance. However, the possibility for a life-threatening event to occur to a visitor increases greatly if the visitor is injured or unprepared for changing weather conditions.

There are some opportunities for novice visitors to experience a sense of discovery of a remote place. However, the Roadless Area is not remote enough to provide a sense of being one of the first to visit or travel through the area. Some opportunities to visit a remote forest away from recent human influences do exists in portions of the Roadless Area as a visitor moves away from travel corridors.

The Pinhoti National Recreation Trail and the Oxford-Cheaha Road provide the primary travel routes through the Blue Mountain Roadless Area. The Pinhoti Trail is blazed and directional signs are posted at intersections and at the beginning of a new trail segment. The Oxford-Cheaha Road is of a high enough development level that it is very easy to follow, even for beginner outdoor visitors.

Opportunities for Primitive and Un-confined Recreation:

Opportunities for primitive and unconfined recreation in the Blue Mountain Roadless Areas would be similar to those offered in the Cheaha Wilderness with the additional opportunity for mountain biking and fishing on Hillabee Creek. Presently, primitive and un-confined recreation opportunities in the Blue Mountain Roadless Area include hiking, backpacking, primitive camping, wildlife viewing, nature exploration, nature photography, mountain biking, fishing, and hunting. The rugged and undeveloped character of the Blue Mountain Roadless Area enhances these opportunities in the area. In addition, the Blue Mountain Roadless Area provides a large land block that is relatively remote when compared to other non-wilderness lands in the National Forests in Alabama. The Blue Mountain section of the Pinhoti Trail is the longest section outside of a designated wilderness that is not crossed by an open road.

There are no designated horse trails or roads designated for horseback use in the Blue Mountain Roadless Area, and therefore no legal horseback riding opportunities are available. However, the Oxford-Cheaha Road provides a hardened route that could be opened to horseback riding. The Pinhoti National Recreation Trail is open to hiking only, and therefore equestrian use and mountain bikes are prohibited. The Oxford-Cheaha Road also provides a good route for mountain bike riding opportunities. No other significant mountain biking opportunities are presently available in the Roadless Area.

Special Features:

The Oxford-Cheaha Road is a significant special feature in the Blue Mountain Roadless Area. As mentioned previously, this road is being studied for a National Register Historic District. The stone arch bridge across Hillabee Creek is a focal point of dispersed recreation, primarily by local visitors.

There are no specifically recognized special features such as wild and scenic rivers or wildlife management areas within the boundaries of the Blue Mountain Roadless Area.

Manageability:

The size of the Blue Mountain Roadless Area is sufficient for wilderness designation by eastern standards, but would be considered a small wilderness in terms of acreage. The lack of significant acreage reduces the opportunities for solitude and challenge. There are two private land inholdings within the boundaries of the Blue Mountain Roadless Area, one of approximately 160 acres and another of just under 40 acres. In addition, approximately 400 acres in Section 34 of Township 17 South, Range 8 East, are presently in Bureau of Land Management (BLM) management status. About 160 acres of mineral rights in Section 26 of Township 17 South, Range 8 East remain in private ownership, although the Forest Service owns and manages the surface. There are no special use permits in the Blue Mountain Roadless Area at this time.

Availability:

A. **Recreation, including Tourism:** Blue Mountain Roadless Area and portions of the surrounding land base have been discussed for backcountry recreation management. Under this management, the area would be managed to provide remote, backcountry recreation experiences to a lesser degree than may be found in designated wilderness. Under backcountry recreation management emphasis, trails would continue to be blazed and more signing inside the boundaries would be found. Opportunities for mountain biking could still be provided. Use of motorized and mechanized equipment would be allowed in the area for all management needs, including trail maintenance and construction. Also, the area would be promoted as an alternative to wilderness, with the intention of diverting some non-wilderness dependent use to the area.

B. **Wildlife:** This area provides habitat for a diversity of wildlife species with fine examples of both upland pine and bottomland hardwood landscapes.

   The Blue Mountain IRA includes approximately 3 miles of 3rd order Hillabee Creek, which flows into Hillabee Lake within the Middle Choccolocco 5th code watershed. Species known to inhabit the watershed include: threatened blue shiner (*Cyprinella caerulea*), threatened fine-lined pocketbook (*Lamsilis altilis*), threatened Alabama moccasinshell (*Medionidus parvulus*), endangered southern clubshell (*Pleurobema decisum*), endangered triangular kidneyshell (*Ptychobranchus greeni*), endangered Tulotoma snail (*Tulotoma magnifica*), and threatened lacy Elimia (*Elimia crenatella*). Regional Forester sensitive species include: coldwater darter (*Etheostoma ditrema*), coal darter (*Percina brevicauda*), bronze darter (*Percina palmaris*), a caddisfly (*Hydroptila choccolocco*), a caddisfly (*Hydroptila particiae*), Appalachian snaketail (*Ophiogomphus incurvatus*), and Alabama Jamesianthus (*Jamesianthus alabemensis*). The Cheaha beloneurian stonefly (*Beloneuria jamesae*), *Gomphyus parvidens*, a dragonfly, ample Elimia (*Elimia ampla*), acute Elimia (*Elimia acuta*), and walnut Elimia (*Elimia bullula*) are rare species endemic or largely limited to the watershed.

C. **Water Availability and Use:** Hillabee Creek is a water source for a municipal watershed lake.

D. **Livestock, Timber and Minerals:** There are no livestock operations, nor the potential for such operations in either of the Roadless Areas. The Blue Mountain Roadless Area is classified as unsuitable for timber production in every alternative except Alternative D. Even under this alternative, suitable timberlands would be minimal on a forest scale once the riparian areas and steep slopes of Blue Mountain were considered. The Blue Mountain Roadless Area is less than 1% of the National Forests in Alabama land base. Timber harvest and the associated wood products production would be prohibited by wilderness designation on the remaining suitable acres. In the 1970's there was some interest in oil and gas for the entire Talladega Division. A lease was granted to an oil company for a year, but after testing no commercial exploration was conducted. Potential for commercial deposits of Federal Leasable minerals is low.

E. Land Uses: At the present time, there are no special use permits authorizations issued for the Blue Mountain Roadless Area. There are two private land inholdings in the Blue Mountain Roadless Area. Outstanding mineral ownership applies to another 160 acres. There are no existing ROWs to either of these private inholdings.

F. Cultural Resources: The Oxford-Cheaha Road was built by the Civilian Conservation Corps (CCC) and is being studied for possible designation as a National Register Historic District. The Oxford-Cheaha Road represents outstanding examples of CCC workmanship, including stone retaining walls, culverts, and a stone arch bridge. The stone arch bridge is one of the primary features of the Oxford-Cheaha "CCC Road". Wilderness designation would limit access to the stone arch bridge to foot and possibly horseback traffic only. This lack of access may significantly limit the visitation to the road, and, due to the need to keep the area in a primitive setting, would also reduce the options for on-site interpretation. Some opportunities for historic interpretation and education may be lost in the event of wilderness designation.

G. **Management Considerations** (Fire, insects and disease, and non-federal lands)**:** The level of complexity for fire management, including prescribed fire, will increase with wilderness designation. Planned fires for fuel reduction or habitat enhancement will need to consider the impacts to wilderness and the natural processes taking place in the wilderness prior to approval. Methods of ignition and construction of necessary fuel breaks also become more complex with wilderness designation. Ignition may be limited to natural methods such as lightening strikes. Fire line construction will be limited to hand tools only if a prescribed fire is to be management ignited. Also, use of motorized and mechanized equipment will require Forest Supervisor or Regional Forester approval prior to use. Fires near the private land inholdings or near the boundary line that is adjacent to private land would be of greater concern. This concern would be similar in the event of an insect or disease outbreak that is threatening private lands.

   The acreage in Section 34 that is presently under BLM management would also present an additional layer of complexity until such time as the acreage is released to Forest Service management. Routine wilderness management operations would likely not be affected, but an additional layer of communication will be necessary as long as these lands are left in the management of the BLM.

Several Southern Pine Beetle infestations have occurred in the Blue Mountain Roadless Area. In the past five years, a few small SPB spots have been recorded, approximately three acres total. These outbreaks are expected to continue in the future. Wilderness designation will make control of these and other insect outbreaks more difficult to control, thus increasing the possibility that an outbreak may spread to other national forest or private land.

The Blue Mountain Shelter is located within the boundaries of the Blue Mountain Roadless Area. Removal or relocation of this shelter will be necessary to conform to wilderness policy concerning structures.

Cheaha A &B Additions Wilderness Evaluation

Solitude:

The Cheaha A Roadless Area proposed in the July 18, 1997 revision of the Roadless Area Inventory included approximately 236 acres of land that was formally State Park land acquired by the Forest Service. Since the 1997 revision of the Roadless Area Inventory, the interdisciplinary team and Talladega Ranger District staff agreed to minimally modify the Cheaha A Roadless Area with an approximately 60 acre addition to the north. This discussion will include the modified Cheaha A Roadless Area as well as the Cheaha B Roadless Area.

The Cheaha A Roadless Area includes McDill Point, a popular viewpoint that overlooks much of the Talladega National Forest and the surrounding rural communities. The viewshed from McDill Point includes a mountainous horizon and a foreground that includes some rural type of developments. McDill Point affords the visitor a place for quiet reflection, giving the visitor a sense of remoteness apart from surrounding development. Because the visitor is standing in the remote, undeveloped part of the forest managed much like the surrounding Cheaha Wilderness rather than in an area that shows evidence of recent management activities, the visitor can gain a sense of separateness and isolation from the developed area visible from the viewpoint.

The Pinhoti National Recreation Trail passes through the eastern portion of the Cheaha A Roadless Area. This is a highly popular trail and is expected to become more popular with through hikers as the Pinhoti eventually becomes part of a corridor connection to the Appalachian Trail. At present, large group size and frequent trail traffic diminish the opportunities for solitude in the portion of the Roadless Area immediately surrounding the Pinhoti. Opportunities for solitude in some portions of the Cheaha A Roadless Area are further impacted by the presence of the adjacent Cheaha State Park. Many visitors to the State Park hike along the Pinhoti with McDill Point as a destination. This frequent day use from the State Park to McDill Point affects opportunities for solitude and is much more difficult to regulate than overnight use.

A portion of the Cheaha A Roadless Area is bounded by the Talladega Scenic Drive. The vehicle sounds coming from the Scenic Drive will be easily heard over portions of the Roadless Area, but the effects to solitude would be no greater than in other portions of the existing Cheaha Wilderness bounded by the Talladega Scenic Drive.

Terrain of the Cheaha A Roadless Area may be described as moderately steep to very steep terrain with rocky sideslopes predominant in some areas. These sideslopes culminate on the ridge that contains McDill Point. The terrain of the Cheaha B Roadless Area is not as steep and severe as the Cheaha A Roadless Area. Slopes may be described as moderately steep with an occasional steep pitch.

The eastern boundary of the Cheaha B Roadless Area is bounded by private land. Opportunities for solitude may be affected in the portions of the Roadless Area adjacent to these private lands, primarily depending on the type of management activities taking place on these lands. A small part of the eastern boundary is also bounded by a county road, which may affect solitude in the eastern sections of the Roadless Area, particularly if traffic volumes on this road increase over time.

In the northwestern corner of the Cheaha B Roadless Area, some quality opportunities for solitude may be found. This portion of the Roadless Area is immediately adjacent to the existing Cheaha Wilderness and is primarily consistent with the remoteness and solitude that may be found in the Cheaha Wilderness. Some evidence of occasional illegal ATV use may also be seen in this section of the Roadless Area, which will affect the opportunities for solitude if left unaddressed.

Natural Appearance:

The Cheaha A Roadless Area is an undeveloped and natural appearing landscape. Much of the area was managed by the State of Alabama park system in a natural condition. The remainder is composed of rough, rocky terrain that inhibits development of roads and structures. This rocky terrain and shallow soils also inhibits management for high quality timber products. A short section of the Pinhoti National Recreation Trail passes through the Cheaha A Roadless Area. The Pinhoti is a hiking trail only and therefore does not significantly diminish the natural appearance of the surrounding forest.

The natural appearance of the Cheaha B Roadless Area has been affected by several factors. First, there are several low development roads passing through the Area, some of which have been improved to the level of adding gravel to the roadbed. There is some evidence of illegal ATV use occurring on several of these roads. The degree of impact of this ATV use varies among roads, but at this time the use has not risen to a level that would cause significant resource damage. The second factor to natural appearance includes some evidence of past timber activity that still exists in the Roadless Area. Two thinning units were harvested in the mid 1990’s and some evidence of timber activities, such as log landing sites, may still be found in the Roadless Area. Much of this evidence has been muted over time and will continue to fade as time passes on. The third factor is the evidence of timber management activities that have recently taken place on the forty-acre tract of private land adjacent to the northwest corner of the Roadless Area. Evidence of clear-cut timber harvests is present on this tract and is visible when standing near the north and northeast boundaries of the Cheaha B Roadless Area.

Geological Strata:

Both of the Cheaha Roadless Areas (A&B) are a part of Cheaha Mountain, which contains the highest peak in Alabama. Cheaha Mountain is a part of the Southern Appalachian Mountains, which collectively contain the highest elevations found in Alabama. Both of the Roadless Areas contain mountain longleaf and shortleaf pine trees and other xeric vegetation. They are also similar in that they contain meta sandstone and slate rock outcroppings and were once a source of iron ore and other minerals.

Biological Strata:

Rare communities and habitat associations of the Cheaha Mountain Roadless Areas are very similar and include mountain longleaf, mixed shortleaf/longleaf, open pine hardwood, riparian zones, loblolly flats, cliff faces, mesic hardwood, xeric oak/pine ridgetops, and talus slopes. Possible rare communities and habitat associations for the Cheaha Mountain Roadless Areas include springs, seeps, glades, rocky barrens cert/limestone formations, and mesic basic forests.

The Cheaha A Roadless Area contains approximately 235 acres of Yellow Poplar - White Oak - Northern Red Oak forest types. Forest types in the Cheaha B Roadless Area include approximately 32 acres of Loblolly Pine-Hardwood, about 105 acres of primarily Longleaf Pine, about 396 acres of primarily Loblolly Pine, about 29 acres of Virginia Pine, and about 74 acres of White Oak-Northern Red Oak-Hickory stands.

Ecological Strata:

Land type associations for the Cheaha A Roadless Area are from the Southern Ridge and Valley Section, and the Sandstone, Shale and Chert Ridge subsections. This land type association is currently represented in the existing Cheaha Wilderness. The geologic age of the Roadless Area is from the Silurian-Devonian period and the soil parent material is primarily sandstone with some shale.

Land type associations for the Cheaha B Roadless Area are from the Southern Ridge and Valley Section, and the Quartzite and Talladega Slate Ridge Subsection. This land type association is currently represented in the existing Cheaha Wilderness. The geologic age of the Roadless Area is from the Silurian-Devonian period and the soil parent material is primarily sandstone with some shale.

Stand ages for the Cheaha A Roadless Area are primarily undescribed because the majority of this Area did not come into Forest Service ownership until recent years. Stand ages for the Cheaha B Roadless Area date from 1910 to 1990. There are approximately 394 acres in the 11 to 30 age class, approximately 46 acres in the 30 to 60 age class, approximately 146 acres in the 61 to 80 age class, and approximately 50 acres in the 81 to 100 age class

There are no designated botanical or zoological areas in either of the Roadless Areas.

Scientific/Educational Values:

There are no Research Natural Areas or Experimental Areas inside the boundaries of the either of the Roadless Areas.

Historical/ Social/Cultural Values:

No archeological surveys have been conducted in the proposed Cheaha A Roadless Area. At present there has been one archeological survey conducted in the proposed Cheaha B Roadless Area. This survey consisted of 115 acres surveyed for the DD 6 Timber Sale in 1995. The survey area was described as containing moderate to steep side slopes and narrow ridge crests. The survey located one small prehistoric lithic scatter on a ridge overlooking Mill Shoal Creek. Additional prehistoric sites may be located on any level landforms near drains. Saddles, benches and other flat upland landforms may also contain sites.

The tract of land that makes up the Cheaha A Roadless Area was relatively recently acquired from the Nature Conservancy. Historic settlement of the area will need research to better understand the potential for historic sites within the area. The Cheaha B Roadless Area was acquired by the federal government from the Alabama Mineral Land Company in the 1930's and from Kimberly Clark relatively recently. Historic sites associated with late 19th century and early 20th century logging and farming activities can be expected in the area.

Challenge:

The level of risk associated with the Cheaha A Roadless Area is basically consistent with the existing Cheaha Wilderness. However, a couple of points should be noted. The additional area that was added to the Cheaha A Roadless Area is bounded by the Talladega Scenic Drive. Due to the presence of this highly developed road, the degree of challenge is diminished. However, the same conditions are present along a significant portion of the western boundary of the existing Cheaha Wilderness. A second point that should be noted is the potential change of management of the Pinhoti National Recreation Trail. At this time, it is the policy of the National Forests in Alabama to provide a greater degree of challenge in designated wilderness by not blazing trails inside the boundaries of designated wilderness.

The level of risk in the Cheaha B Roadless Area is not as great as in the existing Cheaha Wilderness, primarily due to evidence of roads that are still apparent over much of the area. Private land development along the eastern boundary could further diminish the level of challenge in this area.

Due to the development surrounding the Cheaha A Roadless Area, there is little possibility that a visitor would have a feeling of being one of the first to explore the vicinity. However, much of the area is remote and undeveloped enough to provide novice outdoor enthusiasts with some degree of discovery of a remote area. The Cheaha B Roadless Area varies in the degree of challenge present. The eastern boundary is bounded by private land and a county road, and therefore provides a diminished degree of challenge in the immediate area. The western boundary of Cheaha B Roadless Area falls along a portion of the eastern boundary of the existing Cheaha Wilderness. Steeper grades, fewer roads, and presence of the adjacent wilderness provide a greater degree of challenge to the visitor in this part of the Roadless Area. Moreover, wilderness designation of the Cheaha B Roadless Area would likely result in a greater degree of challenge for visitors to the existing Cheaha Wilderness.

Roads and trails in the Cheaha A and Cheaha B Roadless Areas include the Pinhoti National Recreation Trail, the Nubbin Creek Trail, and numerous unimproved roads. At present, the trails are blazed in the stretches outside of the Cheaha Wilderness boundary and left unblazed in stretches inside the boundaries of the Cheaha Wilderness. An exception is the Pinhoti National Recreation Trail, which has blazed sections in wilderness. Due to the rocky nature of the trail bed in some sections, basic outdoor skills such as use of a map and compass are necessary in the Cheaha Wilderness. It is expected that the same degree of challenge could be provided in the Cheaha A and Cheaha B Roadless Area along the trails if they became designated wilderness.

Steep and rocky terrain does add some degree of challenge to visitation of both the Cheaha A and Cheaha B Roadless Area. Similar conditions may be found in the Cheaha Wilderness and the adjacent Cheaha State Park.

Opportunities for Primitive and Un-confined Recreation:

The Cheaha A and Cheaha B Roadless Areas are proposed as additions to the existing Cheaha Wilderness. Opportunities for primitive and unconfined recreation in the Roadless Areas would be typical for the existing Cheaha Wilderness and include hiking, backpacking, primitive camping, nature exploration, nature photography, and hunting. There are no designated horse trails or roads designated for horseback use in either of the Areas, and therefore no legal horseback riding opportunities are available. Both the Pinhoti National Recreation Trail and the Nubbin Creek Trail are open to hiking only, and therefore mountain bikes are prohibited. No significant mountain biking opportunities are present in either of the two Roadless Areas. McDill Point in the Cheaha A Roadless Area is a focal point for some dispersed recreation use, but no concentrated recreation activities are presently occurring in the either of the Roadless Areas.

Special Features:

As mentioned above, McDill Point is a locally known focal point for dispersed recreation activities. There are no specifically recognized special features such as wild and scenic rivers within the boundaries of either Cheaha A or Cheaha B Roadless Areas.

Manageability:

Both Cheaha A and Cheaha B Roadless Areas are being considered as an addition to the existing Cheaha Wilderness. If added to the Cheaha Wilderness, the Cheaha A Roadless Area would provide some wilderness management efficiencies and enhance the wilderness character found in the Cheaha Wilderness. If added to the existing Cheaha Wilderness, Roadless Area A would reduce over one mile of interior wilderness boundary while adding only a short section of additional interior boundary that would follow an existing road. This would reduce possible confusion over boundaries and reduce boundary maintenance needs. Also, the addition of the Cheaha A Roadless Area may enhance the wilderness character of the designated wilderness lands adjacent to the Roadless Area by applying wilderness management to a greater land block.

Wilderness designation adds a degree of complexity to firefighting in that special permission must be obtained for use of motorized equipment and tractors. This will not affect Cheaha A to as great a degree as it would affect other areas of the national forest because the steep and rocky terrain present in much of the area already requires the use of hand tools or a more indirect approach to wildland firefighting.

Except for a small section of the northern boundary and the western boundary along the existing Cheaha Wilderness, Cheaha B Roadless Area is bounded entirely by private landlines. Addition of the Cheaha B Roadless Area may make manageability of the eastern boundary of the Cheaha Wilderness more difficult. Firefighting to protect private lands would become of greater concern, particularly if future use of the lands included residential development. Wilderness designation would add a degree of complexity to firefighting protocol, particularly initial attack methods. The degree of influence of outside forces on the natural forces taking place inside the Wilderness would also vary, depending on the future use of the private lands.

Availability:

A. Recreation, including Tourism: There are no developed recreation sites within either Cheaha A or Cheaha B Roadless Area. The character of the terrain basically prohibits the development of concentrated recreational use facilities. Tourism in the immediate area focuses primarily on the adjacent Cheaha State Park and the Talladega Scenic Drive. Neither of the

Roadless Areas have the potential to significantly enhance local tourism opportunities.

B. Wildlife: This area provides habitat for a diversity of wildlife species. Adding both these areas to wilderness is not expected to have significant effects to wildlife.

The Cheaha A parcel includes primarily upland areas and thus does not include riparian or aquatic species of special interest. The area is within the upper portion of the Cheaha 5th code watershed. A number of federally listed aquatic species are known to inhabit the watershed, including, but not limited to the following: threatened blue shiner (*Cyprinella caerulea*), threatened fine-lined pocketbook (*Lampsilis altilis*), and threatened Lacy Elimia (*Elimia crentella*). Regional Forester sensitive species include: coal darter (*Percina brevicauda*), bronze darter (*Percina palmaris*), lined chub *(Hybopsis lineapunctata*), Helma's net-spinning caddisfly (*Cheumatopsyche helma*), and a caddisfly *(Hydroptila berneri*). The Cheaha beloneurian stonefly (*Beloneuria jamesae*) is a rare species endemic to the watershed.

The Cheaha B parcel includes approximately ¼ mile of riparian habitat along Mill Shoal Creek and 1 mile of Cave Creek. Both of these second order streams drain into Ketchepedrakee Creek. The Ketchepedrakee 5th code watershed includes the following sensitive species: lined chub (*Hybopsis lineapunctata*), Tallapoosa muscadine bridled darter (*Percina* sp.cf. *macrocephala*), bronze darter (*Percina palmaris*), and an unnamed crayfish (*Cambarus englishi*). *Cambarus speciosus*, another unnamed crayfish, is a rare species probably found within the watershed.

C. Water Availability and Use: Cheaha A Roadless Area consists primarily of a dry ridge and therefore water availability would not be affected by wilderness designation. Cave Creek flows through a portion of the Cheaha B Roadless Area, but this small creek is not considered a significant source of water for the larger municipal population.

D. Livestock, Timber and Minerals: There are no livestock operations, nor the potential for such operations in either of the Roadless Areas. Including both areas in the wilderness system is not expected to have significant effects on the timber program. The government owns the mineral rights in Cheaha A and Cheaha B.

E. Land Uses: At the present time, there are no special use permits authorizations issued for either the Cheaha A or Cheaha B Roadless Areas. There are no private lands inside the boundaries of either Area. The Nubbin Creek trailhead is located inside the boundary of Cheaha B. The parking lot will need either to be excluded or relocated if Cheaha B is added. A non-system road on Cheaha B provides one access point to the private land entirely bounded by Forest Service. This is a prescriptive use road with no right-of-way. Designation of Cheaha B as wilderness would eliminate this access, but not eliminate access to the private parcel.

F. Cultural Resources: There are no known potentially significant historical sites in either the Cheaha A or Cheaha B Roadless Area. Although a significant part of the Cheaha A Roadless Area was recently acquired and has not been researched, it is not anticipated that this tract would contain cultural resources that would require intensive management.

G. Management Considerations (Fire, insects and disease, and non-federal lands): The level of complexity for fire management, including prescribed fire, will increase with wilderness designation. Planned fires for fuel reduction or habitat enhancement will need to consider the impacts to wilderness and the natural processes taking place in the wilderness prior to approval. Methods of ignition and construction of necessary fuel breaks also become more complex with wilderness designation. Ignition may be limited to natural methods such as lightening strikes. Fire line construction will be limited to hand tools only if a prescribed fire is to be management ignited. Also, use of motorized and mechanized equipment will require Forest Supervisor or Regional Forester approval prior to use. These additional layers of complexity will likely be of greater concern to the Cheaha B Roadless Area than to the Cheaha A Area because of the private lands on the eastern boundary of the Cheaha B Area. This concern would be similar in the event of an insect or disease outbreak that is threatening private lands. A 100 feet buffer between wilderness and public roads and between wilderness and private land may mitigate some interface problems for fire and other management.

Oakey Mountain Wilderness Evaluation

Solitude:

The Oakey Mountain Roadless Area consists of approximately 6,080 acres on the north end of the Shoal Creek Ranger District in the Talladega National Forest. Most of the area consists of mountainous type topography typical of the foothills of the Appalachian Mountain chain. Elevations range from highest point of 1,938 feet on Oakey Mountain to about 760 feet near Terrapin Creek. The majority of the area may be described as moderately steep terrain, with Oakey Mountain and the immediate vicinity being described as very steep terrain. Viewsheds over most of the Area consist of neighboring mountain ranges or the stream drainages that dissect the Area.

The Oakey Mountain Roadless Area is arranged in an irregular pattern that is bounded entirely by roads, private land or the Chief Ladiga Rail Trail. This irregular pattern results in a highly varied degree of influence from developments or other influences that originate from outside the Area. Some parts of the proposed Area are

¼ mile or less in total width. Two watershed lakes with constructed earthen dams also lie within the boundaries of the Roadless Area. A block of about 600 acres inside the Area could be described as being a core area that would be relatively free from the sights, sounds or immediate influences of sources other than those occurring in the Roadless Area. This approximately 600 acre block can generally be described as the portions of the Oakey Mountain Roadless Area that are east of the Terrapin Creek Watershed Lake and lie inside a land block that is one-half mile from the either of the watershed lake improvements or the private lands and open roads that define Area boundaries on the east side (see map). In the remainder of the Area, private lands, watershed developments, or roads affect or may potentially affect the sights, sounds, or natural processes of the Area. This is particularly true for the portion of the Area lying north and east of the Oakey Mountain ridge.

The Pinhoti National Recreation Trail traverses the western and northern sections of the Area, beginning at FS Road 500 and continuing north-easterly toward Terrapin Creek Watershed Lake - Site 31, then crossing the dam of the Lake and continuing westerly through the northern portion of Oakey Mountain, and then passing northerly to the Chief Ladiga Trail, which forms a northeast boundary of the Roadless Area. The Pinhoti is open to foot traffic only, and is primarily used by backpackers and day hikers. The influence of noise from this type of recreational use is generally very low when group size is kept to no more than six to ten people.

Natural Appearance:

The Oakey Mountain Roadless Area contains two watershed lakes. The Terrapin Creek Watershed Lake – Site 31, lies in the western portion of the roadless area. This lake was constructed by the Soil Conservation Service (now NRCS) primarily for the purpose of flood control, although the potential for future municipal water supply was recognized when the lake was developed. The lake and its associated developments completely dissect the Roadless Area in a north-south manner, in a sense isolating the parts of the Area lying east of FS Road 500 and west of the lake from the remainder of the Roadless Area. The earthen dam for the lake is maintained by a local soil conservation district. Maintenance requirements include periodic grass mowing and removal of saplings and other vegetation. Removal of the dam or allowing this area to revert to natural processes is not a practical option.

The second watershed lake is located in the extreme eastern portion of the Roadless Area. This lake was also constructed by the Soil Conservation Service and is managed by a local soil conservation district. The lake is located on Mathis Branch and is known as Mathis Branch Watershed Lake – Site 15. This lake is much smaller than the Terrapin Creek watershed lake, but evidence of local use is prevalent on and around the dam. Dam maintenance includes periodic mowing and clearing. Removal of the dam or allowing this area to revert to natural processes is not a practical option

There are two improved roads that extend into the Area. Forest Service Road 551 forms the southwest boundary on one side of the Roadless Area and turns east to extend into the Roadless Area for approximately 0.5 miles. The other road, Forest Service Road 550B enters the Area from the southeast side of the Area. This road is a gated, improved road that extends approximately 1 mile into the area. Both roads are closed all year long. If left un-maintained, these roads would likely revert to a natural appearing landscape over time.

Also present in the Area are a number of unimproved roads used for timber harvest in the early 1990's. Most of these harvest activities occurred prior to Forest Service ownership of the harvested land. The road system constructed to support these activities was quite extensive and is still discernable. Evidence of recent timber harvest and regeneration activities is also present in some parts of the Area. Approximately 3% of the Roadless Area is presently in timber stands that were regenerated after 1990.

Geological Strata:

The Oakey Mountain Roadless Area represents a part of the foothills of the Southern Appalachian Mountains and contains some the highest elevations found in Alabama. Interesting geologic features of the area includes meta sandstone and shale rock outcroppings. Portions of the Area were once a source of iron ore and other minerals. Vegetation common to the Area includes mountain longleaf and shortleaf pines and other xeric vegetation.

Biological Strata:

Rare communities and habitat associations of the Oakey Mountain Roadless Area include mountain longleaf, mixed shortleaf/longleaf, open pine hardwood, riparian zones, loblolly flats, cliff faces, mesic hardwood, xeric oak/pine ridgetops, and talus slopes. Possible rare communities and habitat associations for the Oakey Mountain Roadless Area include springs, seeps, glades, rocky barrens cert/limestone formations, and mesic basic forests.

Many of the rare community types that occur in the Oakey Mountain Roadless Area require active forest management practices, particularly the use of prescribed fire.

Forest types include approximately 2,800 acres of Chestnut Oak-Scarlet Oak-Yellow pine stands, approximately 910 acres of White Oak-Northern Red Oak-Hickory stands, approximately 515 acres of loblolly pine stands, approximately 530 acres of Virginia pine stands, and approximately 275 acres of shortleaf pine stands. Other forest types cover less than 200 acres of the Roadless Area.

Stand ages in the Roadless Area date from 1889 to 1993. There are approximately 151 acres in the 0 to 10 age class, approximately 395 acres in the 11 to 30 age class, approximately 1,304 acres in the 31 to 60 age class, approximately 1,668 acres in the 61 to 80 age class, approximately 1,924 acres in the 81 to 100 age class, and approximately 114 acres in the 101 plus age class.

The Oakey Mountain Roadless Area contains suitable habitat for the white fringeless orchid (a candidate species), which occurs in seeps and springs.

There are no designated botanical or zoological areas in the Roadless Area.

Ecological Strata:

Land type associations for the Roadless Area are from the Southern Ridge and Valley Section; Sandstone, Shale, and Chert Subsection and the Talladega Slate Ridge Subsection. Approximately 3,316 acres are described as in the Sandstone, Shale, and Chert Ridge Subsection, and approximately 2,827 acres are in the Quartzite and Chert Ridge Subsection. These associations are represented in the Cheaha Wilderness and Dugger Mountain Wilderness as well.

The geologic age of the Roadless Area is from the Cambrian and Silurian-Devonian periods. Soil parent material includes shale, slate, sandstone, and phyllite.

Scientific/Educational Values:

There are no Research Natural Areas or Experimental Areas inside the boundaries of the Roadless Area.

Historical/ Social/Cultural Values:

There have been seven previous archeological surveys conducted within the boundaries of the Oakey Mountain Wilderness Area. Only the first of these, reported in December of 1987, was of large blocks of areas for a timber sale, consisting of a 475-acre survey of mostly steep, eroded ridges, with no archeological sites located. Since that time, six smaller surveys have been conducted for projects such as the Pinhoti Trail (1993), a 20-acre timber salvage project (1993), a communication tower site (1996), an underground cable Special Use Permit survey for the communication tower (1997), and two fire line surveys (1996 and 1999). Most of these survey areas consisted of narrow steep ridges with erosion of the topsoil noted. The four archeological sites located by these surveys have all consisted of light prehistoric lithic scatters. These have been found on ridge saddles and on terraces overlooking the larger drains in the area.

Additional archeological sites can be expected on ridge saddles, on any benches or other level upland landforms, and on terraces overlooking the drains in the area. The 1840 Cherokee Boundary ran through the area.

Challenge:

Visitors to the Oakey Mountain Roadless Area face some degree of challenge, primarily due to terrain that is rough and steep as compared to the terrain existing throughout the majority of the state of Alabama. A visitor walking along the ridge top of Oakey Mountain would cross terrain, though not as high, similar to Cheaha and

Dugger Mountains. However, the view from the Oakey ridgeline reveals less human development than is visible from the wilderness portion of the west facing aspect of Cheaha Mountain or the north and northwest facing aspects of Dugger Mountain in the Dugger Mountain Wilderness.

The Pinhoti National Recreation Trail is the primary travel route through the Oakey Mountain Roadless Area. The Pinhoti is blazed with the distinctive turkey foot blaze traditionally used to mark the Pinhoti Trail. The northern part of the Pinhoti, including the section that runs through the Oakey Mountain Roadless Area, is also marked with a blue square blaze. Though trail blazing is a popular trail marking technique and a welcome amenity to many hikers, this trail management feature reduces the degree of challenge typically presented by a minimally developed hiking trail.

About two miles from where the Pinhoti Trail enters the western boundary of the Roadless Area, the Trail crosses the dam of Terrapin Creek Watershed Lake – Site 31. Although the area around the dam offers a pleasant recreation experience, it significantly diminishes any feeling of being one of the first travelers to the area.

Some opportunities for off-trail challenge are available in the parts of the Roadless Area that lay east of Terrapin Creek Lake – Site 31 and south of the Pinhoti Trail. A visitor to these parts of the Area would find occasional abandoned travel ways in various states of natural recovery, but it would still be possible for a person to become temporarily lost without the use of basic outdoor skills and equipment such as a map and compass. The possibility of this becoming a life-threatening event is minimized by the presence of surrounding developments, roads, and travel ways that could be followed to an improved road or other developed facility.

The greatest opportunities for use of outdoor skills such as trip planning, orienteering, and backcountry survival are found on the main ridgeline of Oakey Mountain and the immediately surrounding ridges and valleys. Due to the rugged topography and the undeveloped character of this part of the roadless Area, outdoor skills would be required for exploration and visitation.

Opportunities for Primitive and Un-confined Recreation:

The land base bounded by the Oakey Mountain Roadless Area provides a place for pursuit of a variety of primitive and unconfined recreation opportunities. These primarily include hiking, backpacking, primitive camping, nature exploration, hunting, and fishing. There are no designated horse trails or designated roads for horseback use in the Area, and therefore no legal horseback riding opportunities. Use of mountain bikes is allowed throughout the area, though no significant mountain biking activity is occurring at this time. Concentrated recreation activity occurs primarily at the two watershed lakes located inside the boundaries.

Special Features:

There are no specifically recognized special features within the boundaries of the Oakey Mountain Roadless Area.

Manageability:

Though the 6,080 acres of the Oakey Mountain Roadless Area is of adequate size to manage as wilderness, the irregular pattern of the Area boundary would diminish the effectiveness of preservation management inside the boundaries. The entire Roadless Area is bounded by an improved road, paved trail, or private land. In some cases, the boundary alignment creates very narrow fingers of Forest Service managed land surrounded by private land. Much of the private land adjacent to the Roadless Area is actively managed for farm fields, residences, or heavily managed timberland.

The two watershed lakes present within the Roadless Area would present significant obstacles for effective management as wilderness. The earthen dams for both lakes are regularly maintained by bush hogging. Motorized equipment is currently being used for maintenance work on the lakes and the dams. Due to the large size of the dams and the need to maintain them in good repair, use of primitive tools for dam maintenance would not be practical. In addition to dam maintenance, both lakes contain constructed structures likely to require periodic maintenance with modern equipment, including motorized equipment and mechanized transport.

Availability:

A. **Recreation, including Tourism:** There are no developed recreation sites within the Oakey Mountain Roadless Area. However, the two watershed lakes mentioned above are focal points of concentrated recreational activity, primarily from local residents living close to the forest. Dispersed recreation activities include hiking and backpacking on the Pinhoti National Recreation Trail, hunting, fishing, camping, mountain biking and some illegal use by ATV and horseback riders.

   Developed parking is not available adjacent to the Roadless Area nor in the immediate vicinity. One ¼ mile section of the Roadless Area boundary borders on the Chief Ladiga Trail, a multiple use trail managed primarily for bicycling and walking. Should the area become a designated wilderness, mountain biking would no longer be allowed in the Area.

B. **Wildlife:** This area provides habitat for a diversity of wildlife species. The area is just north of the RCW habitat management area, but does not possess the attributes of outstanding red cockaded woodpecker habitat.

   Oakey Mountain IRA includes known or potential habitat for at least 22 terrestrial vertebrate species of viability concern. Three Federally listed species, two Regional Forester's Sensitive Species, and seventeen locally rare, state-listed, or Federal candidate species are associates of the habitats represented on Oakey Mountain IRA.

The red-cockaded woodpecker (RCW), a federally endangered species, is not likely to be accommodated in the infrequently burned, remote habitats of Oakey Mountain IRA, although many of the existing mature Xeric Pine and Pine-Oak forest habitats could be made suitable with thinning and burning treatments. Bachman's sparrow and the Northern pine snake would also be expected in habitats suitable for the RCW. However, the area is outside of the established RCW Habitat Management Area, and is not likely to be managed to be suitable habitat in the foreseeable future.

The Dry Mesic Oak and Dry & Dry-Mesic Oak Pine forest habitats in Oakey Mountain IRA are predominately in older age classes. Much of the area is steep and elevated terrain, interspersed with riparian areas. These conditions are favored by several species of viability concern whose ranges reach their southern extent at the northern edge of Talladega Division. Oakey Mountain IRA may represent the best available habitat for species such as the cerulean warbler, worm-eating warbler, gray bat, Northern long-eared bat, and the pygmy shrew.

Oakey Mountain IRA includes approximately 2.5% early successional forest habitats, 14% sapling forest habitats, 47% mid-successional forests, and 36% late successional forest habitats. The early successional forest habitats will soon grow into the sapling forest stage. Without management intervention or natural disturbance, rare early successional forest habitat associates such as Appalachian Bewick's wren, Allegheny cottontail, Allegheny woodrat, long-tailed weasel, and Eastern spotted skunk will be extirpated from the area as early successional forests become limiting to local populations.

Approximately 17% of the Oakey Mountain IRA is in riparian habitats. These habitats too, are predominately in late-successional condition. Several terrestrial vertebrate species of viability concern are dependant on riparian habitats. Swainson's warbler prefers disturbed riparian thickets. Green and seepage salamanders are dependent on rare communities usually associated with riparian areas. Mesic deciduous forest habitats associated with riparian areas, at this northern extent of Talladega Division, are the best available summer roosting habitat for several rare species of bats.

The Oakey Mountain IRA includes approximately two miles of 3rd order South Fork Terrapin Creek, which flows into a small reservoir within the 5th code Terrapin watershed. Federally listed species known to inhabit this watershed include: fine-lined pocketbook (*Lampsilis altilis*), southern clubshell (*Pleurobema decisum*), southern pigtoe (*Pleurobema georgianum*), ovate clubshell (*Pleurobema perovatum*), and triangular kidneyshell (*Ptychobranchus greeni*). Regional Forester aquatic sensitive species include: coldwater darter (*Etheostoma ditrema*), bronze darter (*Percina palmaris*), Appalachian snaketail (*Ophiogomphus incurvatus*), Tennessee heelsplitter (*Lasmigona holstonia*), ridged mapleleaf (*Quadrula rumphiana*), southern creekmussel (*Strophitus subvexus*), Alabama rainbow (*Villosa nebulosa*), and Coosa combshell (*Villosa vanuxemensis umbrans*).

C. **Water Availability and Use:** The two major drainages for the Oakey Mountain Area are the South Fork of Terrapin Creek and Mathis Branch. Both of these drainages have been dammed to form watershed lakes that lay within the boundaries of the Roadless Area. A portion of the lake formed by the South Fork of Terrapin Creek is on private land. This private land is upstream from the portion of the lake surrounded by Forest Service managed land.

D. **Livestock, Timber and Minerals:** There are no livestock operations, nor the potential for such operations in this Roadless Area. Currently, the Oakey Mountain Roadless Area is not classified as suitable for timber production. Since 1991, approximately 10 acres of timber has been received watershed regeneration work. There has been one timber sale since 1991, but the timber units were thinnings. Timber harvest and the associated wood products production would be prohibited by wilderness designation. The Oakey Mountain Roadless Area represents 1% of the National Forests in Alabama land base. The Oakey Mountain Roadless Area is classified as unsuitable for timber production in every alternative except Alternatives D and F. Even under these alternatives, suitable timberlands would be minimal on a forest scale once the riparian areas and steep slopes of Blue Mountain were considered. In the 1970's there was some interest in oil and gas for the entire Talladega Division. A lease was granted to an oil company for a year, but after testing no commercial exploration was conducted. Potential for commercial deposits of Federal Leasable minerals is low.

E. **Cultural Resources:** The federal government acquired most of the land within the proposed Oakey Mountain Wilderness from the Nature Conservancy and the Georgia Kraft Company relatively recently. Research of historic settlement is needed to better understand the potential for significant historic sites within the area.

F. **Land Uses:** The two watershed lakes lying within the boundaries of the Oakey Mountain Roadless Area are managed under a cooperative agreement with the County Soil and Water Conservation District. As mentioned above, the dams are currently being maintained with motorized equipment. Special Use permits have been issued authorizing the water to back onto Forest Service land.

G. **Management Considerations (Fire, insects and disease, and non-federal lands):** Wildfire control on Oakey Mountain will be affected if this roadless area is designated wilderness. Use of motorized equipment will require approval of the forest supervisor and use of tractors and plow equipment will require approval of the regional forester. This could potentially slow initial attack of wildfires. As a point of reference, there have been four wildfires in this area in the past ten years, but less than one-half of one percent of the total acreage was burned.

The western portion of the roadless area is directly adjacent to the Dugger Mountain Wilderness. Presently, a two-lane gravel road separates the two areas. Wilderness designation of Oakey Mountain would create a large area on the western side of Oakey Mountain and the eastern side of Dugger Mountain where use of motorized equipment would be regulated to some degree, although the road would provide a substantial firebreak between the two areas. Wilderness designation would also prohibit prescribed burning for fuel management unless authorized by a wilderness fire management plan that specifically prescribes and sanctions the use of fire for a specific purpose(s).

Several Southern Pine Beetle infestations have occurred on Oakey Mountain. In the past five years, a few small SPB spots have been recorded in the southern end. These outbreaks are expected to continue in the future. Wilderness designation will make control of these and other insect outbreaks more difficult to control, thus increasing the possibility that an outbreak may spread to other national forest or private land.

Approximately 87 percent of the boundary of the Oakey Mountain Roadless Area is directly adjacent to private land. If designated as wilderness, management concerns will include the spread of disturbances, such as fire and insect outbreaks, which may affect management practices occurring on the adjacent private land or the value of the land. Conversely, management practices or use of the private land adjacent to the wilderness may influence the natural processes occurring inside the wilderness boundaries.

Wilderness designation would not allow for RCW reclamation.

Reed Brake Wilderness Evaluation

Solitude

The Reed Brake Roadless Area consists of approximately 601 acres in the heart of the northwest block of the Oakmulgee Division of the Talladega National Forest. The area is bounded by Forest Service Road 723, Mayfield Creek, and two tributary drainages of Mayfield Creek. The topography of the area consists primarily of one major ridge extending into several finger ridges, a minor ridge in the southeastern corner of the Roadless Area, and several hollows and drainages that feed into Mayfield Creek. Elevations range from a high of about 542 feet along the eastern boundary to a low of approximately 300 feet along Mayfield Creek. Terrain can be generally described as either moderately steep hills topped by finger ridges or typical of the flat floodplain of Mayfield Creek.

The perimeter shape of the boundary basically follows landform, forming a somewhat solid block in an area that is surrounded by other Forest Service land. Forest Service Roads nearby Reed Brake include FS 718, 718A, 718B, 718C and 723. Road 723 forms the eastern boundary of the Area and roads 718B and 718C are within about ½ mile of the boundary of the Area. FS 718 and 718A are approximately one mile from the Reed Brake Area. With the exception of 718B, all of these roads are closed from May 1 to October 15, or approximately 5.5 months per year. Road 718B is closed year round.

Noises coming from outside the area are minimal. FS Road 723 is not a heavily traveled road, though at certain times of the year, such as during hunting seasons or week-ends, noise intrusions may be more prevalent near this improved road. During the months of road closure, noises originating from outside the Roadless Area will be primarily limited to those coming from aircraft.

There are no improved trails in the Roadless Area. Travel within the Reed Brake area itself is limited to unimproved woods roads, fire lines, abandoned roadbeds, and game trails. Visitors to the area rely on route finding skills not dependent on trails, improved roads or other mapped improvements.

Because the Reed Brake Roadless Area is in an area of the district relatively free from private land influences, the primary affects on the sense of solitude for a visitor would come from other forest visitors, forest management activities, or overhead sources.

Natural or Appears to be Natural and Free from Disturbance

To the untrained eye, Reed Brake Roadless Area may appear to be very much a natural area free from human management. There have been no timber harvest cuts in the Roadless Area in the past ten years. There have been no wildlife openings managed or watershed improvement projects conducted in this time period as well. However, the Area was prescribe burned in 1998, excluding approximately 100 to 150 acres that were excluded from the burn to provide comparison for possible successional studies.

Moreover, the Roadless Area is being actively managed for red-cockaded woodpeckers. The Area contains four active and four in-active red-cockaded woodpecker clusters. About 10 artificial cavities (inserts) have been installed in three of the active clusters and additional cavities are planned for the near future.

Midstory control by use of chainsaws and herbicide treatments has recently been completed, primarily within active cluster sites.

Geological Strata

The geologic nature of the Area is typical to that of the coastal plain of Alabama, and does not contain features uncommon to the Oakmulgee division of the Talladega National Forest. Topography can be described as undulating to rolling hills with canebrake seeps common.

The geologic age of the Area falls under the Upper Cretaceous period with the soil parent material primarily being marine sediments, clays, and sands. The land type association (LTA) is from the Gordo Formation with forest associations being primarily longleaf pine.

Biological Strata Range

Floral communities of the Reed Brake area include those associated with seeps, springs, canebrake, mesic hardwood, riparian, upland hardwood, pine/hardwood, longleaf pine, and possibly longleaf/shortleaf pine and mesic basic communities.

Forest types include approximately 344 acres of longleaf pine stands and approximately 257 acres of Yellow Poplar-White Oak-Northern Red Oak stands. Age classes consist of approximately 140 acres in the 61 to 80 age class, 257 acres in the 81 to 100 age class, and 205 acres in the 101 plus age class.

In terms of aquatic habitat, Mayfield Creek is a first to second order ephemeral to intermittent tributary to South Sandy Creek within the Big Sandy Creek 5th code watershed. Aquatic resources of special concern may include the following Regional Forester sensitive species: goldstripe darter (*Etheostoma paravapinne*), Allegheny snaketail (Ophiogomphus alleghaniensis), Cocoa culbtail (*Gomphus hybridus*), treetop emerald dragonfly (*Somatochlora provacans*), an unnamed caddisfly (*Hydroptila paralatosa*), and rayed creekshell (*Anodontoides radiatus*). There are no known occurrences of listed aquatic species within the area.

The Reed Brake Roadless Area contains suitable habitat for the Alabama Canebreak Pitcher Plant (*Sarracenia rubra* var. a*labamense*), which occur on upper hillside seepage bogs and canebreak seepage bogs.

There are no designated botanical or zoological areas.

Ecological Strata

The Reed Brake Roadless Area is located in the Coastal Plains, Middle Section, Upper Clay Hills Subsection. The Area contains 620 acres of an ecosystem not currently represented by any designated wilderness in Alabama.

Scientific/Educational

The Reed Brake Roadless Area is made up entirely of the Reed Brake Research Natural Area. Research Natural Areas are permanently maintained and protected in natural conditions for the purpose of conserving biological diversity, conducting non-manipulative research and monitoring, and fostering education. Non-manipulative research that does not significantly impact the ecological composition, structure, or function of the area is appropriate.

Historical/Cultural Values

At present there have been no archeological surveys conducted within the boundaries of the proposed Reed Brake Wilderness Area. However, based on the surveys conducted across the Oakmulgee Ranger District, numerous prehistoric archeological sites have been located in drainages similar to Mayfield Creek and its tributaries. These sites have consisted of prehistoric lithic scatters and short-term campsites. Any level landform near a perennial water source in the proposed area may contain prehistoric archeological sites that have not been recorded. Seasonally occupied sites may also be found near intermittent water sources.

The area of the proposed Reed Brake Wilderness is located within a larger tract of land that was acquired from the Kaul Land and Lumber Company in the 1930s. These large Kaul tracts do not usually have historic house ruins, however, there may be historic structural ruin sites associated with the early 20th century logging industry.

Challenge

The Reed Brake Roadless Area itself does not contain any developed trails or improved roads. Access into the area is readily available by way for FS 723 and several existing woods roads branching from this main road. Evidence of fire lines and abandoned roadways also provide visitors with routing systems to navigate through the area. Because these travelways are not mapped, signed, or blazed, there is a slight degree of challenge available in the area. Use of a map and compass is necessary as in any non-roaded or non-trailed areas of the forest. However, because the area is very small, there is little possibility for becoming truly lost. In the worst circumstances, a visitor would be required to follow Mayfield Creek downstream for no more than 2 to 3 miles before finding an improved Forest Service road, and approximately 1-½ mile of this downstream journey would be outside of the Roadless Area.

Use of the Reed Brake Area does not require outdoor skills above those typically necessary for routine forest use. Because of small number of acres in the Area and the presence of improved roads, the level of risk and challenge is unremarkable. Similar experienced may be found in most other undeveloped areas of the Forest.

It is unlikely that a visitor would have a sense of discovery in this Area. Proximity to access roads and small size of the area would preclude visitors from the sense that they are experiencing a truly remote location.

Opportunities for Primitive and Un-Confined Recreation

The Reed Brake Roadless Area is contained entirely by the Oakmulgee Wildlife Management Area (WMA). Hunting in the Roadless Area is allowed according to the regulations and seasons prescribed for the WMA.

The Reed Brake Area contains some opportunity for dispersed camping. The open longleaf stands and the broad floodplain of Mayfield Creek provide inviting opportunities for general forest activities such as photography, nature study, or a brief retreat from the developed world. However, opportunities for long distance, remote activities such as backpacking and backcountry discovery are not available in this small area. The Area does not provide opportunities for activities that are typically wilderness dependent, or a full range of opportunities typically associated with designated wilderness such as backpacking, long distance trails, and other remote experiences.

Opportunities for fishing, rafting and canoeing are not provided by Mayfield Creek or it’s tributaries. Horseback riding is prohibited in the area.

Special Features

There are no specifically recognized special features within the boundaries of the Reed Brake Roadless Area.

Manageability

Reed Brake and the immediately surrounding area is a significant habitat area for red-cockaded woodpecker management. Because management of this species requires frequent burning, mid-story management, and nest cavity protection or replacement, simultaneous management of the area for both wilderness and red-cockaded woodpecker habitat would be very difficult. Management of this endangered species requires frequent man-caused interruptions in the operation of natural forces taking place in the Area. Conversely, designation of the Roadless Area as wilderness would add a layer of increased complexity to the prescribed management practices for red-cockaded woodpeckers. About two-thirds of the Roadless Area was prescribe burned in 1998.

Reed Brake Roadless Area is approximately 601 acres in size. The Area is surrounded on all sides by Forest Service managed land. Because of the small size of the Area, little more than one mile wide at the widest point, there is no core area to be found within the boundaries. To provide a core area for Reed Brake, management of a sizeable area surrounding Reed Brake in a wilderness like prescription would be required, and then the maximum core area obtainable would be 620 acres.

Availability

A. Recreation, including Tourism: There are no developed or dispersed recreation facilities in the Reed Brake Area. There is little to no primitive, dispersed camping taking place in the Area. Hunting is allowed in the area according to the regulations governing the Oakmulgee Wildlife Management Area. Fishing is permitted on Mayfield Creek, although it is not considered a fishing resource. The current ROS classification for the Area is Roaded Natural.

B. Wildlife: Reed Brake is being managed for Red-Cockaded Woodpecker habitat. The Red-Cockaded Woodpecker is an endangered species whose habitat management generally includes prescribed burning, removal of mid-story, and management of artificial cavities. No wildlife openings are managed in the Area.

   The area also provides habitat for many game and non-game species, primarily those dependent on upland long-leaf pine communities or bottomland hardwood communities.

C. Water Availability and Use: Mayfield Creek forms a portion of the western boundary of the Area, and several of the creek tributaries flow from inside the boundaries. Mayfield Creek is not a municipal watershed and there are no known watershed storage needs. Because Research Natural Area designation minimizes ground-disturbing activities, water quality is expected to remain at the current level regardless of wilderness status.

D. Livestock, Timber and Minerals: There are no suitable acres for timber production in Reed Brake. The area is managed as a Research Natural Area with the current prescription to manage in a natural state. There are no livestock operations or the potential for such operations. There is potential for oil or gas exploration, as is there potential across the Oakmulgee District. It is not known whether there is a commercial interest in this exploration. There are no special uses currently in place for the area.

E. Cultural Resources: Due to the presence of Mayfield Creek, the possibility for the occurrence of prehistoric lithic scatters and short-term campsites may exist. No significant historic sites are known to exist.

F. Land Uses: There are no current special use permits in the Area.

G. Management Considerations (Fire, insects and disease, and non-federal lands): As mentioned above, the Reed Brake Roadless Area is actively managed for Red-cockaded woodpeckers and requires frequent prescribed burning and removal of midstory vegetation. Wilderness designation of the Roadless Area would create management conflicts because much of the Roadless Area will continue to be actively managed to provide habitat enhancements for Red-cockaded woodpeckers. The required endangered species management practices would interfere with natural processes, thus creating a conflict with the Congressional intention for management of designated wilderness. If habitat enhancement practices are implemented in the wilderness, an additional layer of administrative complexity will be introduced to the management of this species.

There have been no wildfires in the area in the last ten years. Wilderness designation would require administrative approval for use of motorized equipment. However, due to the drainages and roads lying close to or along the boundaries of the Roadless Area, fire spread to areas outside of the boundaries would not be of great concern.

There have been no significant insect or disease outbreaks in the Roadless Area in the last ten years.

There are no private lands that would be affected by designation as wilderness. There would be no effect on transportation systems outside the Roadless Area caused by wilderness designation. Currently, there are no designated trails or highly used paths in the Area. Trail construction would not be recommended if the Roadless Area were to be designated as wilderness. However, if such designation were to increase recreational use to a point where resource damage due to recreational travel was anticipated, trail construction may become necessary.

Wilderness Need

The concept of wilderness is multifaceted as envisioned by the authors and framers of the 1964 Wilderness Act. As such, there are a number of factors to consider in assessing the need for additional wilderness.

Outdoor recreation is one of the benefactors of wilderness and is one of the drivers of wilderness demand and wilderness management. According to trend data collected from 1965 to 1994, the trend in recreation visits to National Forest Wilderness has paralleled designations and increased over time (Cordell, 1999). National Forests in Alabama fall into two Market Areas in Cordell's study. The Conecuh District is included in the Apalachicola and Conecuh National Forest Market Area, and all other Alabama districts are in the Bankhead, Talladega, and Tuskegee National Forest Market Area. Participation rates and trends in wilderness indicate a continued increase in visitation to wilderness, climbing an estimated 171% by year 2050. This would suggest approximately 1,520,000 visits by people within the Apalachicola and Conecuh forest market area, and 5,390,000 visits for the other

Alabama Forests by 2050 (see Tables 3C-2A and 3C-2B in Developed and Dispersed Recreation discussion).

In addition to recreation in wilderness, there is a non-user component that values wilderness and is important to understand when analyzing roadless areas, allocations, and the need for additional wilderness. Studies have shown that the non-visiting general public values the knowledge that natural environments exist and are protected. This motivation can be considered an existence benefit. The current generation also obtains the off-site benefit of knowing that protection today will provide Wilderness to future generations.

Existence and bequest motivations are sometimes referred to as nonuse or passive use benefits. Several studies have shown the importance and value people place on these passive use benefits of wilderness (Cordell, 1999). These values are reflected in the National Survey on Recreation and the Environment (NSRE, 2001) finding that 69.8% of those surveyed agreed or strongly agreed to the question, "How do you feel about designating more federal lands in your state as wilderness?" Over 96 percent agreed or strongly agreed with the statement, "I enjoy knowing that future generations will be able to visit and experience wilderness areas."

Furthermore, wilderness is valued for preserving representative natural ecosystems, diversity of landscapes and for research. Currently, at the forest scale, the Southern Cumberland Plateau (Bankhead Ranger District) and the Southern Ridge and Valley Sections (Shoal Creek and Talladega Ranger Districts) occurring within the National Forests in Alabama are represented by at least one of the three designated wildernesses (see Table 3C-22 in the Wilderness and Roadless discussion). The Coastal Plain and Flatwoods Lower Section (Conecuh Ranger District) and the Coastal Plain Middle Section (Oakmulgee and Tuskegee Ranger Districts) are currently unrepresented by wilderness in Alabama. Reed Brake on the Oakmulgee District is the only inventoried Roadless Area within these sections. At a larger scale, the Bankhead, Oakmulgee, Shoal Creek, Talladega, and Tuskegee Districts are all part of the Southeastern Mixed Forest Province. The Conecuh District is part of the Outer Coastal Plain Mixed Forest Province.

Alabama contains approximately 1.43% of the land area of the United States. However, Alabama has only 0.04% of the National Wilderness Preservation System. This indicates an apparent under representation of wilderness.

APPENDIX D

Determination of Eligibility

Wild and Scenic River Evaluation

National Forests in Alabama

This Appendix summarizes the process used on the National Forests in Alabama to evaluate candidate rivers and streams for determination of eligibility as recreational, scenic, or wild rivers. Rivers determined to be eligible, will be further studied for suitability to be recommended to Congress for designation into the National Wild and Scenic River System.

Background

In the 1960s, the country began to realize that our rivers were being dammed, dredged, diked, diverted and degraded at an alarming rate. To lend balance to our history of use and abuse of our waterways, Congress created the National Wild and Scenic Rivers System. In October of 1968, the freshly penned Wild and Scenic Rivers Act pronounced,

> **It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dams and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.**

While sometimes criticized as not reaching its full potential, there is little doubt that the Wild and Scenic Rivers Act has been a success, helping to protect some of this nation's premiere rivers. The Wild and Scenic Rivers Act does not generally lock up a river in the same was as a wilderness designation. The idea is not to halt development and use of a river; instead, the goal is to preserve the character of a river. Uses compatible with the management goals of a particular river are allowed; change is expected to happen. Management not harmful to the outstanding resources of a designated river, or curtailing its free flow, are usually allowed. The term "living landscape" has been frequently applied to wild and scenic rivers. Of course, each river designation is different, and each management plan is unique.

The Analysis

The area of study or bounds of analysis for this study included all land found inside the proclamation boundaries of the National Forests in Alabama. These lands were further divided by their physiographic section. The sections included are: the Coastal Plain and Flatwoods Lower Section (Conecuh National Forest), Coastal Plain Middle Section (Oakmulgee Ranger District and Tuskegee National Forest), Southern Ridge and Valley Section (Shoal Creek and Talladega Ranger Districts), and Southern Cumberland Plateau Section (Bankhead National Forest. In determining the presence of absence of outstandingly remarkable values analysis was expanded to the state and/or nation. All inventoried rivers with identified outstandingly remarkable values (ORVs) are eligible for wild or scenic river status but not all eligible rivers are necessarily suitable to be included in the wild and scenic river system.

The analysis team first reviewed every watershed found on the National Forests in Alabama to determine which, if any, rivers might contain outstandingly remarkable values (ORVs) and therefore deserved further analysis. Also the analysis team automatically studied each river suggested by citizens for possible eligibility classification. Finally the team reviewed all the rivers on the USDI list for possible wild or scenic consideration. The rivers studied for potential eligibility are:

BANKHEAD RANGER DISTRICT	Brown Creek, Brushy Creek, Caney Creek, North Fork Caney Creek, South Fork Caney Creek, Capsey Creek, Clear Creek, Collier Creek, Freeman Hollow Creek, Key Mill Branch, Owl Creek, Turkey Creek, Rush Creek , West Flint Creek
CONECUH RANGER DISTRICT	Blackwater River, Conecuh River, Five Runs Creek (ELIGIBLE), Yellow River
OAKMULGEE RANGER DISTRICT	Beaver Swamp Creek , Cahaba River (ELIGIBLE), Elliots Creek, Little Oakmulgee Creek, Oakmulgee Creek, South Sandy Creek
SHOAL CREEK RANGER DISTRICT	Beaver Dam Creek, Choccolocco Creek, Greenleaf Creek, Hillabee Creek, Jones Branch, North Fork Greenleaf Creek, Shoal Creek, South Fork Terrapin Creek
TUSKEGEE RANGER DISTRICT	Choclafaula Creek, Uphapee Creek

To be considered eligible at least one outstandingly remarkable character needs to be identified for the river under study. These ORVs fall into the following categories: scenic quality, recreational, geological, fish and wildlife, historical, cultural, ecological, or some other land characteristic. The potential ORVs where analyzed in context with other features in their own physiographic section. In other words, a potential ORV found in the Southern Ridge and Valley Section, i.e. outstanding geologic feature, was compared to other geologic features in the Southern Ridge and Valley Section. The team used their best professional judgment to determine what features, if any, could be classified as an ORV. The key aspect here is that an eligible river must not merely have at least one remarkable value or feature, it must have an outstandingly remarkable value or feature in the judgment of the analysis team.

Detailed worksheets used to evaluate each river or stream are located in the project record for the Plan Revision process.

The Determination

After eligibility was determined, the next task was to classify each eligible river as either: 1) wild, 2) scenic, or 3) recreational. The eligible rivers are:

WILD: none

SCENIC: Chahaba River, Five Runs Creek

RECREATIONAL: none

Five Runs will be studied further to determine its suitability for recommendation to congress for inclusion in the wild and scenic river system. Lack of significant Forest Service ownership along the Cahaba River makes further study by the Forest Service problematic. Therefore, further Forest Service study for this river is not anticipated or recommended. However, the outstandingly remarkable values will be protected through management.

The intent and result of this analysis is not to portray or imply that rivers determined to not have the outstandingly remarkable value or feature necessary to be eligible, are not very beautiful and special places on the National Forests in Alabama.

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APPENDIX E
Vegetation Management Practices

Introduction

The purpose of this appendix is to describe the silvicultural systems, and associated harvest and reforestation methods and other vegetation management practices for the management of the National Forests in Alabama. This information complies with CFR 219.15. Vegetation practices are described, as are applicable circumstances for application, however specific conditions will be addressed at the site-specific, project level. Standards that apply to these practices are detailed in the plan.

Forest stands are constantly changing over time, as trees grow, die and are replaced by other vegetation. These characteristic patterns of vegetation change, or successional trends, are specific to each forest type and are further influenced by site conditions such as soil type, aspect, and elevation. Natural processes such as fire, windstorms, floods, insect attacks, and disease have been evolutionary factors in forests. Forests have evolved to regenerate in the aftermath of these events.

Humans have altered forest ecosystems by logging, road construction, hunting and other recreation, fire suppression, human-caused wild fires, introduction of non-native plants, etc. The National Forests in Alabama have been shaped by extensive clearing of the land for agriculture in the 1800's, logging and wildfires in the early 1900's, and extensive reforestation with loblolly pine during the mid 1900's.

Restoration and maintenance of forest ecosystems is the focus of the management on the National Forests in Alabama. Of particular concern are loblolly pine, shortleaf pine, and slash pine plantations occupying sites that are better suited to longleaf pine ecosystems or other communities. Restoration projects use classic silvicultural systems and modified silvicultural treatments to achieve forest plan objectives.

Silvicultural Systems

Silviculture is defined as the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis. A silvicultural system is a planned series of treatments for tending, harvesting and re-establishing a stand. It includes regeneration methods and intermediate treatments. The proper choice of silvicultural treatments depends on the community type, ecology of the tree species, forest conditions, wildlife habitat needs, and management prescription applied. The system evolves over time as circumstances change and knowledge improves.

The term silvicultural system designates a planned program of land management treatments, i.e., silvicultural practices, during the entire life of a stand to meet both short term and long-range forest plan objectives. Achievement of stand management objectives is determined by the forests' desired future conditions. Desired conditions are described for the National Forests in Alabama at the forest, the management area, and at the management prescription level. Silvicultural treatments are designed to take the forest from the existing conditions toward the desired future condition.

Even-aged Management - An even-aged system strives to maintain and regenerate stands with one age class. Even-aged systems create site conditions similar to large-scale disturbances. If graphed, the diameter distribution, of the dominant stems, in even-aged stands produces a bell shaped curve. Shade tolerant understory trees such as dogwood are not considered part of the dominant stand type.

Even-aged stands often have an uneven-aged appearance. Shade tolerant trees in the mid- and understory, intermediate and suppressed trees of smaller diameters appear to be of different ages. However, upon closer study the suppressed and intermediate trees are the same age as the dominant and co-dominant trees.

Regeneration methods for even-aged management are clearcut, shelterwood, and seed tree.

Regeneration Methods

Clearcut – Clearcutting is the most easily recognized method of regeneration. It mimics natural disaster by removing essentially all of the overstory trees from the site. The objective of clearcutting is to regenerate an even-aged stand. Clearcutting provides favorable conditions for the establishment of shade intolerant tree species. Regeneration of the site following clearcutting can be from natural seeding, advanced reproduction, or planted seedlings. For restoration, clearcutting is often used where a natural seed source for the desired species is unavailable and is followed by planting seedlings.

Seed tree – Seed tree is the harvesting of all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class. Generally about 6 to 10 trees per acre of the desired species are left as seed trees. This method is generally used where good seed trees are exist and where natural regeneration is likely to be successful. Seed trees are usually removed after regeneration is established. Regeneration of the site following seed tree would be from natural seeding. Spot planting of seedlings in areas not adequately stocked may occur.

Shelterwood – Shelterwood is the cutting of most trees, leaving those needed to produce sufficient shade to produce a new age class. The shelterwood may be implemented in two or three stages. A three-stage shelterwood has a prep-cut, a seed cut and a removal cut. The prep-cut provides for the development of crowns of the seed trees to produce seed. A two-stage shelterwood would only have a seed cut and a removal cut. Generally 10 to 15 trees per acre for the desired species are left in the seed cut. The shelterwood method is more suited to those species that are somewhat shade tolerant and less suited to shade intolerant species. As with seed tree, regeneration following shelterwood would be from natural seeding. Spot planting of seedlings in areas not adequately stocked may occur.

Site Preparation – Site preparation usually occurs following the regeneration harvest. The treatments are designed to enhance successful regeneration by preparing the forest floor. Most treatments will reduce undesirable vegetation, re-distribute dead vegetation, and expose some mineral soil. Methods of site preparation include manual, mechanical, prescribed fire, chemical treatments or combinations of these. The use of mechanical site preparation on shelterwood sites may be limited due to equipment size and potential damage to residual trees.

Intermediate Treatments

Prescribed burning – Many of the forest communities of the National Forest in Alabama have long ecological association with fire. However, for many years fire has been excluded or reduced. Ongoing and planned restoration and maintenance projects include the increased frequency of prescribed fire and in some cases the re-introduction of prescribed fire. Prescribed fire is used for site preparation, control of understory and ground vegetation, fuel reduction, and to stimulate the growth of grasses and other fire evolved species. Once a stand is established and attains a size that can withstand prescribed burning, the frequency of burning may be as often as every 2 years.

Pre-commercial Thinning/Release – Pre-commercial thinning treatments are designed to reduce stocking. Release treatments are designed to free trees from competing vegetation. These treatments usually occur soon after stand establishment prior to any stand material reaching a merchantable size. The treatments may be manual, mechanical, or chemical. Pre-commercial thinning is often necessary in stands with natural regeneration because of high numbers of natural stems, which sometime occur in clumps.

Thinning – Thinning is an intermediate stand treatment in even-aged management, made to reduce the density of trees within a stand. Thinning is done primarily to improve growth, enhance forest health, or recover potential mortality, however, thinning may also be done to improve stand structure, enhance visuals or for wildlife habitat improvement. Depending on the objective, trees may be removed from the main canopy (from above), from the lower crown classes (from below), from specific species group, in rows, in strips or by using fixed spacing intervals.

Two-aged Management **-** A two-aged system is designed to maintain and regenerate a stand with two or more age classes. The primary silvicultural system used on the National Forests in Alabama is two-aged management. Even-aged regeneration methods have been modified to leave reserve trees for various purposes, such as visuals or wildlife browse. The result is a two-age condition.

Regeneration Methods

Clearcut with reserves – **Clearcutting with reserves** leaves varying numbers of reserve trees to attain goals other than regeneration. For example, in loblolly pine stands being restored to longleaf pine, existing longleaf trees on the site would be retained indefinitely. Regeneration of the site following clearcutting can be from natural seeding, advanced reproduction, or planted seedlings. For restoration, clearcutting with reserves is often used where a natural seed source for the desired species is unavailable but desired reserve trees are available. Generally site preparation and planting follow harvest.

Seed tree with reserves – Seed **tree with reserves** retains some or all of the seed trees indefinitely for purposes other than regeneration. Regeneration of the site following seed tree would be from natural seeding. Spot planting of seedlings in areas not adequately stocked may occur.

Shelterwood with reserves – A **shelterwood with reserves** retains some or all of the seed trees indefinitely for purposes other than regeneration. As with seed tree, regeneration following shelterwood would be from natural seeding. Spot planting of seedlings in areas not adequately stocked may occur.

Reserves – On the National Forests in Alabama reserve trees are typically any trees of the desired species, relic longleaf pine, hickory, dogwood, or any trees designated for wildlife or aesthetic value. Reserve trees are maintained where available, however in some situations reserves trees are not available or would be a safety hazard to leave. Decisions in these situations are made on a site-specific, case-by-case basis.

Site Preparation – Site preparation usually occurs following the regeneration harvest. The treatments are designed to enhance successful regeneration by preparing the forest floor. Most treatments will reduce undesirable vegetation, re-distribute dead vegetation, and expose some mineral soil. Methods of site preparation include manual, mechanical, prescribed fire, chemical treatments or combinations of these. The use of mechanical site preparation on shelterwood sites may be limited due to equipment size and potential damage to residual trees.

Intermediate Treatments

Prescribed burning – Many of the forest communities of the National Forest in Alabama have long ecological association with fire. However, for many years fire has been excluded or reduced. Ongoing and planned restoration and maintenance projects include the increased frequency of prescribed fire and in some cases the reintroduction of prescribed fire. Prescribed fire is used for site preparation, control of understory and ground vegetation, fuel reduction, and to stimulate the growth of grasses and other fire evolved species. Once a stand is established and attains a size that can withstand prescribed burning, the frequency of burning may be as often as every 2 years.

Pre-commercial Thinning/Release – Pre-commercial thinning treatments are designed to reduce stocking. Release treatments are designed to free trees from competing vegetation. These treatments usually occur soon after stand establishment prior to any stand material reaching a merchantable size. The treatments may be manual, mechanical, or chemical. Pre-commercial thinning is often necessary in stands with natural regeneration because of high numbers of natural stems, which sometime occur in clumps.

Thinning – Thinning is an intermediate stand treatment in even-aged management, made to reduce the density of trees within a stand. Thinning is done primarily to improve growth, enhance forest health, or recover potential mortality, however, thinning may also be done to improve stand structure, enhance visuals or for wildlife habitat improvement. Depending on the objective, trees may be removed from the main canopy (from above), from the lower crown classes (from below), from specific species group, in rows, in strips or by using fixed spacing intervals

Uneven-aged Management - An uneven-aged system is designed to maintain and regenerate a stand with three or more age classes. Uneven-aged systems create site conditions similar to small-scale disturbances. In uneven-aged stands the largest number of stems, of the dominant forest type, is in the smallest diameters decreasing in number as the diameter increases. If graphed, the diameter distribution produces a reverse J shaped curve. These stands have great variety of stem density, tree heights and continuity of canopy. Regeneration methods for uneven-aged management are single-tree selection, and group selection.

Single-tree selection – The single-tree selection method removes individual trees of all size classes throughout the stand to promote growth of remaining trees and to provide space for regeneration. This method is sometimes called individual tree selection. New trees are established in spaces created by harvesting the selected trees. Single-tree selection favors regeneration of shade tolerant species, and is very difficult to apply to shade intolerant conifers. The interval of time between stand entries is termed the cutting cycle. Cutting cycles typically range from 5 to 20 years.

Group selection – The group selection method involves removing small groups of trees to establish a new age class. The width of the groups is commonly approximately twice the height of the mature trees. Small openings are appropriate for shade tolerant vegetation while larger openings are for more shade intolerant vegetation. The interval of time between stand entries is termed the cutting cycle. Cutting cycles typically range from 5 to 20 years. The uneven-aged stand consists of a mosaic of even-aged groups. Group selection with reserves retains some of the trees within the group to attain goals other than regeneration.

Site Preparation – Site preparation for uneven-aged management, as with even-aged management, strives to enhance regeneration. However, methods of site preparation will be limited because of the potential damage to residual stems and advanced reproduction. Chemical methods or a combination of chemical and manual methods are most often effective. Site preparation, pre-commercial thinning, and release treatments may be combined and may occur prior to harvest. Only the areas of the stand where the treatments are need would be treated.

Prescribed burning - The frequency and timing of prescribed fire in uneven-aged stands must be managed carefully. As with even-aged management, prescribed fire will be restricted to times when the newly established age class reaches a size that damage will be minimal. However, new age classes within the stand are created every 5 to 20 years depending on cutting cycle.

Thinning – In uneven-aged management thinning treatments happen simultaneously with the regeneration harvests, however, with group selection, thinning may occur between the groups at any time. Thinning in uneven-aged management further serves the purpose of creating conditions for development of advanced reproduction.

Monitoring/New Information – As a stand grows and develops, whether even-aged or uneven-aged, it must be re-evaluated periodically to determine if objectives are still being met. Additional treatments may be necessary, or planned treatments may be eliminated as conditions change. New information, technologies or even political climate may necessitate a change in management strategy.

Other Considerations

Salvage/Sanitation – Salvage and sanitation are not silvicultural systems or methods of regeneration. They often occur at the same time and are usually discussed together, but they serve different purposes. Salvage cutting is the removal of dead, damaged or dying trees to recover economic value that would otherwise be lost. Sanitation cutting is the removal of trees to improve stand health by stopping or reducing the actual or anticipated spread of insects and disease. Sanitation cutting may include the removal of live healthy trees while salvage cutting does not. Both salvage and sanitation cutting serve the purpose of removing material that could become heavy fuel. This reduces the risk of catastrophic wildfire. Following salvage or sanitation cutting the residual stand must be evaluated to determine the adequacy of stocking. Site preparation or planting may be needed to ensure regeneration depending on the size of the area affected.

Mid-story treatments – The Conecuh National Forest and the Talladega National Forest contain habitat management areas (HMAs) for the red-cockaded woodpecker (RCW), an endangered species. Pine and pine/hardwood stands within the HMAs are managed to provide habitat for the RCW. Populations of RCW have declined in stands with mid-stories, so removal of the mid-story and maintaining open park-like stands is desired in those pine and pine/hardwood stand within RCW HMAs. Mid-story treatment may include manual, mechanical and chemical methods; often follow by prescribed fire. Once desired conditions are achieved, they usually can be maintained with frequent prescribed fire.

A combination of treatments, including reducing the basal area through thinning, re-introducing or increasing the frequency of prescribed fire, and mid-story removal may be necessary to achieve woodland or savanna conditions. These treatments would restore native pyrophytic plants to the herbaceous layer and benefit a suite of species including RCW, quail, Bachman's sparrow, brown-headed nuthatch, American kestrel, fox squirrel, etc.

Selection of Silvicultural System

The selection of which silvicultural system and regeneration method to use is based on the existing forest condition and the desired condition of the management area and management prescription. Silvicultural systems will be applied where they contribute to accomplishing management objectives, and are appropriate for the desired tree species. The following table identifies, by forest community the range of appropriate silvicultural regeneration methods that may be used.

Community type	Even-aged			Two-aged			Uneven-aged	
	Clearcut	Seed tree	Shelterwood	Clearcut w/reserves	Seed tree w/reserves	Shelterwood w/reserves	Group Selection	Single tree selection
Conifer Northern Hardwood	A	N	N	A	N	N	A	A
Mixed Mesophytic	A	A	N	A	A	N	A	A
Coastal Plain Upland Hardwood	A	A	N	A	A	N	A	A
River Flood Plain	A	N	N	A	N	N	A	A
Cypress Tupelo	A	N	N	A	N	N	A	A
Dry-Mesic Oak	A	A	N	A	A	N	A	A
Dry and Xeric Oak	A	N	N	N	N	N	A	A
Xeric Pine and Pine Oak	A	A	A	A	A	A	A	N
Dry and Dry-Mesic Pine-Oak	A	A	A	A	A	A	A	N
Upland Longleaf	A	A	A	A	A	A	A	A
Mountain Longleaf	A	A	A	A	A	A	A	A
Wet Pine	A	A	A	A	A	A	A	N

A=appropriate N=not appropriate

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Appendix F

Terrestrial Species Viability Evaluation Process and Tables

National Forest Management Act (NFMA) regulations, adopted in 1982, require that habitat be managed to support viable populations of native and desirable non-native vertebrates within the planning area (36 CFR 219.19). USDA regulation 9500-004, adopted in 1983, reinforces the NFMA viability regulation by requiring that habitats on national forests be managed to support viable populations of native and desired non-native plants, fish, and wildlife. These regulations focus on the role of habitat management in providing for species viability. Supporting viable populations involves providing habitat in amounts and distributions that can support interacting populations at levels that result in continued existence of the species well distributed over time.

The Southern Appalachian region supports extremely high levels of biological diversity relative to other regions, viewed both nationally and globally. As a result, large numbers of species are present for which population viability may be of concern. Detailed demographic or habitat capability analysis to evaluate population viability is not feasible for this large number of species. Therefore, our goal for this evaluation is to use a clearly defined, transparent process to identify species for which there are substantive risks to maintenance of viable populations, and to ensure consideration of appropriate habitat management strategies to reduce those risks to acceptable levels where feasible.

For comprehensiveness and consistency, evaluation of species viability was coordinated across several national forests undergoing simultaneous plan revisions. These forests are the Jefferson National Forest, Cherokee National Forest, Sumter National Forest, Chattahoochee and Oconee National Forests, and National Forests in Alabama. These forests encompass portions of the Southern Appalachian, Piedmont, and East Gulf Coastal Plain ecoregions. However, the scale for this assessment is set by NFMA regulations as the "planning area," or the area of the National Forest System covered by a single forest plan. Therefore, separate risk assessment was done for each national forest covered by a separate forest plan. Risk assessment was further split where national forest units under the same forest plan occur in different ecoregions, or are widely separated geographically. There are five separate management units on the National Forests in Alabama that are geographically separated from each other. The Bankhead National Forest lies in the Southern Cumberland Plateau. The Talladega Division occurs on the southern edge of the Southern Ridge and Valley, with portions of its southern extent in the Piedmont physiographic region. These two management units fall within the Southern Appalachian ecoregion. The Oakmulgee Division and Tuskegee National Forest lie at the edge of the Fall Line that demarcates the Upper Coastal Plain. The Oakmulgee Division is in west central Alabama, and the Tuskegee is in east central Alabama. The Conecuh National Forest is in the Lower Coastal Plain physiographic region, bordering the state of Florida. The Oakmulgee, Tuskegee, and Conecuh management units fall within the East Gulf Coastal Plain ecoregion. Although viability evaluation was coordinated across the ecoregions, analysis presented here focuses on information relevant to the five management units of the National Forests in Alabama.

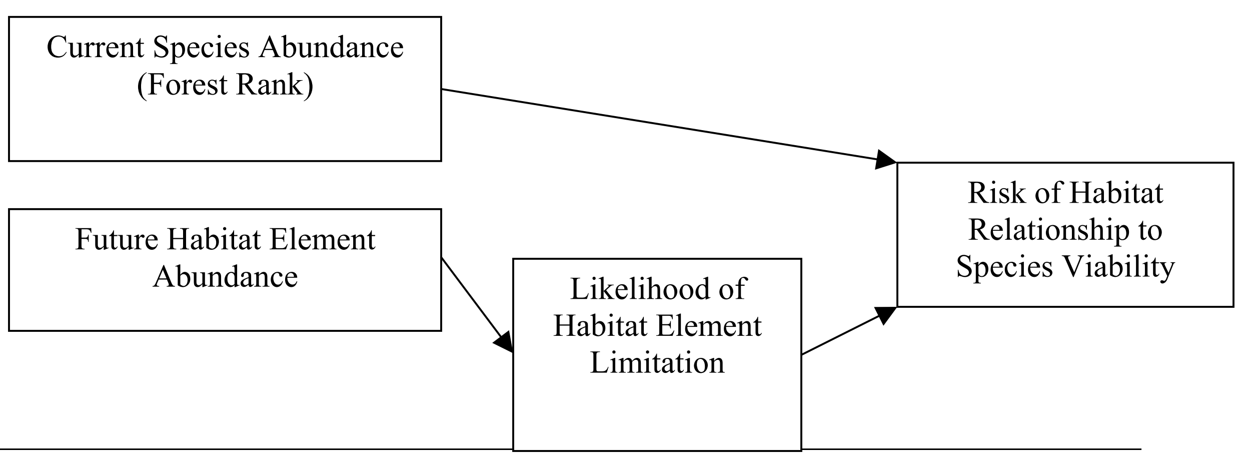
Because NFMA regulations require providing habitat for species viability within the planning area, focus of this evaluation is on habitat provided on national forest land. Surrounding private lands may contribute to, or hinder, maintenance of species viability on national forest land, but are not relied upon to meet regulation requirements. For this reason, habitat abundance was assessed based on conditions found on national forest land. Habitat distribution, however, was assessed considering the condition of intermixed ownerships and conditions, which may affect the interactions of species among suitable habitat patches on national forest land.

Evaluation of migratory birds focused on breeding populations only, unless otherwise indicated. This focus does not mean that wintering and migrating populations were not considered during planning, but that viability evaluation makes most sense when viewed in terms of the relative stability of breeding populations.

Much of the foundational information used in this evaluation was compiled by NatureServe, under a Participating Agreement with the Forest Service. NatureServe is an international non-profit organization, formerly part of The Nature Conservancy. Its mission is to develop, manage, and distribute authoritative information critical to conservation of the world's biological diversity. Partnership with NatureServe was sought as a means to ensure the best available information on species status and habitat relationships was used in this evaluation. Under this agreement, NatureServe staff engaged numerous species experts and state heritage programs to develop a relational database that includes relevant information on species' status, habitat relationships, and threats to viability.

Viability Evaluation Process

Risk to maintenance of viability over the next 50 years was assessed for each species in relation to each of its principle habitat relationships by plan revision alternative. Risk assessment was based on three factors: 1) current species abundance, 2) expected habitat abundance in 50 years, and 3) expected habitat distribution in 50 years (Figure 6.1-1). Once risk ratings were developed, we assessed how well management strategies across alternatives provide for species viability.



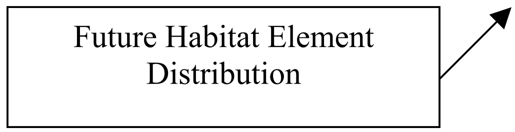


Figure 6.1-1. Relationship of variables used to rate the risk to viability resulting from a species' relationship with a habitat element.

A comprehensive list of species with potential viability concern was compiled for the National Forests in Alabama. The list includes those species found, or potentially found, on the National Forests in Alabama from the following categories:

- Species listed as proposed, threatened, or endangered under the federal Endangered Species Act,
- Species listed on the Regional Forester's Sensitive Species list,
- Species identified as locally rare on the National Forest by Forest Service biologists,
- Birds of conservation concern as identified by the US Fish and Wildlife Service, and
- Declining species of high public interest.

Species lists from all national forests in the Southern Appalachian and Piedmont Eco-regions, and Coastal Plain forests in Alabama, were pooled to create comprehensive lists of species of potential viability concern. NatureServe staff and contractors assigned abundance ranks for each species on the comprehensive eco-region list for each unit of the National Forests in Alabama. These Forest Ranks, or F Ranks, follow the conventions used by NatureServe and others in defining State and Global Ranks (Table 6.1-1).

F Ranks were used in viability risk assessment as a categorical variable representing a species' current abundance. Forest Service biologists reviewed F Ranks developed by NatureServe to identify any inconsistencies between these rankings and Forest Service information. Discrepancies in this abundance variable were resolved through coordination with NatureServe and its contractors. Where conflicting information or opinion on species abundance occurs, the most conservative information (i.e., that indicating lowest abundance) was used.

Only those species that are both confirmed present and rare or of unknown abundance (F1 through F3, and F?) on the National Forests in Alabama were assessed for viability risk. Species ranked as F? were treated as F1 species to provide a conservative approach to those species for which abundance information is not available. Species that are currently abundant on the forest (F4, F5) are assumed to be at low risk of losing viability within the next 50 years, and, therefore, were not further evaluated for viability risk.

Table 6.1-1. Forest Ranks (F Ranks) and definitions used to define status of species on National Forests in Alabama as part of species viability evaluation for forest plan revision, 2002.

F Rank	F Rank Definition
F0	Not present; no known occurrence on the forest unit and forest is outside species' range or habitat not present.
F1	Extremely rare on the forest unit, generally with 1-5 occurrences.
F2	Very rare on the forest unit, generally with 6-20 occurrences.
F3	Rare and uncommon on the forest unit, from 21-100 occurrences.
F4	Widespread, abundant, and apparently secure on the forest unit.
F5	Demonstrably secure on the forest unit.
F?	Present on the forest, but abundance information is insufficient to develop rank.
FP	Possibly could occur on the forest unit, but documented occurrences are not known.
FH	Of documented historical occurrence on the forest unit; may be rediscovered.
FX	Once occurred but has been extirpated from the forest unit; not likely to be rediscovered.

Because viability regulations focus on the role of habitat management in providing for species viability, habitat condition was the primary factor used to drive species viability evaluation. NatureServe staff and contractors identified habitat relationships for all species of potential viability concern, linking each species to vegetation community types, successional stages, and habitat attributes as appropriate. Based on this information, each species was linked by Forest Service biologists to one or more habitat elements. These habitat elements (Table 6.1-2) roughly correspond to categories of management direction included in the draft revised plan, and to sections of effects analysis included in this environmental impact statement. NatureServe staff reviewed and provided adjustments to species' assignment to these habitat element groups.

Table 6.1-2. Habitat elements used to plan for, and assess risk to, viability of terrestrial species during forest plan revision, National Forests in Alabama.

Habitat Element	Element Description
Bogs, Fens, Seeps, Seasonal Ponds	Bogs, fens, seeps, seasonal ponds characterized by saturated soils
Open Wetlands	Open wetlands, marshes, beaver ponds, generally characterized by having some permanent standing water
River Channels	Riverine gravel and sand bars, and river banks subject to flood scour
Glades and Barrens	Glades and barrens characterized by shallow soils, exposed parent material, and sparse or stunted vegetation
Basic Mesic Forests	Basic mesic or "rich cove" forests characterized by calciphilic herbs and usually dominated by maples, basswood, and buckeye.
Rock Outcrops and Cliffs	Rock outcrops and cliffs characterized by exposed rock, shallow soils and sparse vegetation
Spray Cliffs	Rock that remains wet for all or most of the year, associated with waterfalls or seepage

Canebrakes	Canebrakes characterized by dense stands of cane and open canopies, usually within riparian areas
Caves and Mines	Caves and mines with microclimates capable of supporting associated biota
Baygalls and Bayheads	Coastal plain baygalls and bayheads
Coastal Plain Ponds and Swamps	Coastal plain ponds and cypress tupelo swamps
Sandhills	Longleaf pine sandhills in the coastal plan
Wet Savannas and Flatwoods	Coastal plain wet savannas and flatwoods
Mature Mesic Hardwood Forests	Mid- and late-successional mesic deciduous forests, including northern hardwood, mixed mesophytic, mesic oak, and bottomland hardwood forests
Mature Hemlock Forests	Mid- and late-successional eastern hemlock and eastern hemlock-white pine forests in native settings, typically on stream terraces and other mesic sites
Mature Oak Forests	Dry to mesic mid- and late-successional oak and oak-pine forests subject to moderate levels of disturbance sufficient to maintain the oak component
Mature Yellow Pine Forests	Mid- and late-successional southern yellow pine and pine-oak forests maintained in open conditions by frequent fire
Mature Longleaf Pine Forests	Mid- and late-successional longleaf pine forests in the coastal plain maintained in open conditions by frequent fire
Mature Mountain Longleaf Pine Forests	Mid- and late-successional mountain longleaf pine forests maintained in open conditions by frequent fire
Early-Successional Forests	Early-successional forests, typically aged 0-10 years and dominated by woody species
Mature Forest Interiors	Mature forest interiors with minimal adverse effects due to forest edge.
Canopy Gaps	Mid- and late-successional mesic deciduous forests with a diverse vertical and horizontal structure as a result of gaps in the canopy
Woodlands and Savannas	Open woodlands and savannas characterized by low canopy cover and rich grass-dominated understories, and maintained in open conditions by periodic fire
Grasslands	Grasslands with little to no overstory, usually occurring as patches within woodland and savanna complexes and maintained by periodic fire
Mixed Landscapes	Landscapes characterized by a broad mix of successional habitats
Late Successional Riparian	Riparian areas dominated by mid- and late-successional deciduous forests

Early-Successional Riparian	Riparian areas with a dense understory or early-successional forest in riparian areas
Snags	Forests containing an abundance of snags
Downed Wood	Forests containing an abundance of downed wood and thick leaf litter
Den Trees	Forests containing an abundance of large hollow trees suitable as den trees
Hard Mast	Forests producing abundant hard mast
Remoteness	Remote habitats away from frequent human disturbance
Lakeshores	Forested shores of lakes and ponds
Water Quality	High water quality in streams and lakes

Effects to these habitat elements are analyzed in this EIS under other sections. Based on these analyses, each habitat element was assigned categorical values by alternative to indicate future abundance (Table 6.1-3) and distribution (Table 6.1-4), general likelihood that the habitat element would limit viability of associated species (Table 6.1-5), and overall effect of national forest management on the habitat element (Table 6.1-6).

The future abundance variable (Table 6.1-3) is defined as the abundance of the associated habitat element in fifty years if the alternative were selected and implemented over that fifty-year period. This variable indicates the abundance of the habitat element on national forest land only, to provide focus on the role of the national forest planning area in supporting associated species. Its focus on national forest land only reflects recognition that viability is to be provided within the "planning area" (area covered by the forest plan). Definitions of abundance categories are stated in quantifiable terms in order to be objective as possible; however, in many cases quantifiable estimates of future abundance are not available. In these cases, knowledge of Forest Service biologists was used to assign abundance values based on current conditions and the magnitude and direction of effects expected under each alternative.

Table 6.1-3. Values used to categorize projected abundance of each habitat element after 50 years of implementing each forest plan revision alternative.

Habitat Abundance Value	Description
Rare	The habitat element is rare, with generally less than 100 occurrences, or patches of the element generally covering less than 1 percent of the national forest planning area.

Occasional	The habitat element is encountered occasionally, and generally is found on 1 to 10 percent of the national forest planning area.
Common	The habitat element is abundant and frequently encountered, and generally is found on more than 10 percent of the national forest planning area.

Similar to the future abundance variable, the future distribution variable (Table 6.1-4) is defined as the distribution of the associated habitat element in fifty years if the alternative were selected and implemented over that fifty-year period. In contrast to the abundance variable, it includes consideration of intermixed ownership patterns and conditions, and their general effects on movements and interactions of individuals among the suitable habitat patches found on national forest land. Because assessing adequacy of habitat distribution for a species requires a level of knowledge not available for most species, and the number of species being evaluated is very large, we have defined habitat distribution in terms of a historical reference condition—that which was present prior to the major perturbations associated with European settlement of the planning area. This period is generally defined as 1000 to 1700 A.D. This approach relies on the assumption that a habitat distribution similar to that which supported associated species during recent evolutionary history will likely contribute to their maintenance in the future, and that the further a habitat departs from that historical distribution, the greater the risk to viability of associated species. This approach has its own set of difficulties, as evidence of presettlement conditions relevant to the planning area is often anecdotal and scarce. In addition, the reference period may have included a wide variety of conditions because of growing aboriginal populations and accompanying use of agriculture and fire during the early portion of this period, and their subsequent dramatic decline due to disease epidemics following early European contact. Nevertheless, the precision required to assign the categorical values for this variable is not high, and may be supported by general positions described in mainstream conservation literature (see Wear and Greis 2002). Knowledge of Forest Service biologists was used to assign distribution values, based on interpretations of historical conditions supported by conservation literature, current conditions, and magnitude and direction of effects expected under each alternative.

A difference in scale between the Habitat Abundance and Habitat Distribution variables is intentional in order to bring two different pieces of information into the analysis. Habitat Abundance has been defined in terms of the amount of habitat on national forest land only. This definition reflects the amount of habitat available to support a species on the national forest, in recognition of regulation requirements that viability be provided within the “planning area” (area covered by the forest plan). Habitat Distribution, on the other hand, is defined to include the landscape setting of National Forest lands, which includes the intermingled private lands and broken ownership patterns that provides the context for national forest populations and may affect ability of individuals living on national forest lands to interact with each other.

Table 6.1-4. Values used to categorize projected distribution of each habitat element after 50 years of implementing each forest plan revision alternative.

Habitat Distribution Value	Description
Poor	The habitat element is poorly distributed within the planning area and intermixed lands relative to conditions present prior to European settlement. Number and size of habitat patches and/or their evenness in distribution across the landscape is greatly reduced.
Fair	The habitat element is fairly well distributed within the planning area and intermixed lands relative to conditions present prior to European settlement. Number and size of habitat patches and/or their evenness in distribution across the landscape is somewhat reduced.
Good	The habitat element is well distributed within the planning area and intermixed lands relative to conditions present prior to European settlement. Number and size of habitat patches and/or their evenness in distribution across the landscape is similar to or only slightly reduced relative to reference conditions.

Habitat element abundance and distribution variables were combined to create one variable to indicate the general likelihood that the habitat element would be limiting to populations of associated species (Table 6.1-5). In this general context, habitat limitation refers to a habitat factor—quantity, distribution, or quality—that results in risk to continued existence of the species within the planning area. Everything else being equal, quality habitat elements that are rare and poorly distributed are those most likely to cause risk to viability of associated species; those that are common and well distributed are least likely to cause risk to viability of associated species.

Table 6.1-5. Likelihood of habitat limitation (High, Moderate, and Low) to associated species as derived from habitat abundance and distribution values.

Habitat Abundance	Habitat Distribution		
	Poor	Fair	Good
Rare	High	High	Moderate
Occasional	High	Moderate	Low
Common	Moderate	Low	Low

Providing for species viability requires providing abundant and well-distributed habitat in ways that allow existing populations to persist or expand. The ability of existing populations to respond to available habitat depends in part on their current robustness, which is generally a function of population size. In general, for a given habitat condition, small populations will be at more risk than large populations. To reflect this fact, likelihood of habitat limitation variable was combined with a species' F Rank for each species/habitat element interaction to generate viability risk ratings (Table 6.1-6). Associations of very rare species with habitat elements that are likely to be most limiting were identified as those most at risk; associations of more common species with habitats less likely to be limiting received lower risk ratings. Ratings include three levels of "high" risk (Table 6.1-6) to ensure that results err on the side of caution.

Table 6.1-6. Viability risk ratings for species/habitat interactions as a function of a species' F Rank and likelihood of habitat element limitation variables.

Likelihood of Habitat Element Limitation	Species F Rank		
	F1 or F?	F2	F3
High	Very High	High	Moderately -High
Moderate	High	Moderately-High	Moderate
Low	Moderately-High	Moderate	Low

Once viability risk ratings were developed for each species/habitat relationship, habitat elements most commonly associated with risks to species viability were identified by counting the number of very high, high, and moderately high ratings associated with each. To assess the role of national forest management in minimizing viability risk associated with each habitat element, a management effects variable was assigned to each habitat element by alternative. The management effects variable (Table 6.1-7) categorizes the goal of management for the habitat element, the expected resulting trend, and any additional opportunity for minimizing viability risk. Numbers of very high, high, and moderately-high risk ratings were summarized by management effects variable by alternative to assess how well alternatives address viability-related habitat needs.

Table 6.1-7. Values used to categorize the effect of national forest management in minimizing or contributing to species viability risk associated with each habitat element by forest plan revision alternative.

Management Effect Value	Description
1	Abundance and distribution of the habitat element is maintained or improved by providing optimal protection, maintenance, and restoration to all occurrences (with limited exceptions in some cases). Little additional opportunity exists to decrease risk to viability of associated species because management is at or near optimal.
2	Abundance and distribution of the habitat element is improved through purposeful restoration, either through active management or passively by providing for successional progression. Opportunity for decreasing risk to associated species is primarily through increasing rates of restoration, where possible.
3	The habitat element is maintained at approximately current distribution and abundance, though location of elements may shift over time as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to increase abundance and distribution of the habitat element.
4	Regardless of management efforts, the habitat element is expected to decrease in distribution and abundance as a result of factors substantially outside of Forest Service control (e.g., invasive pests, acid deposition). Opportunity to reduce risk to viability of

	associated species is primarily through cooperative ventures with other agencies and organizations.
5	The habitat element is expected to decrease in distribution and abundance as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to maintain or increase this habitat element.

Distribution of viability risk was also summarized by species status, i.e., federally listed under the Endangered Species Act, listed as Regional Forester's sensitive species, or identified as locally rare or of other concern. The species status summary highlights the relative role of other provisions included in law and policy that result in additional consideration of at-risk species during planning.

Viability Evaluation Results

Species viability evaluation for the Bankhead National Forest and Talladega Division of the Talladega National Forest included consideration of 1368 species of the Southern Appalachian ecoregion. Of these species, 149 on Bankhead, and 199 on Talladega Division from the Southern Appalachian ecoregion are considered rare and are known to occur on these management units. Species viability evaluation for the Conecuh National Forest, Tuskegee National Forest, and the Oakmulgee Division of the Talladega National Forest included consideration of 199 species of the Alabama Coastal Plain. Of these species, 115 on Conecuh, 17 on Tuskegee, and 40 on Oakmulgee Division from the Alabama Coastal Plain are considered rare and are known to occur on Conecuh National Forest, Tuskegee National Forest, and Oakmulgee Division of the Talladega National Forest.

Outcomes for habitat elements, as described under individual effects analysis sections, are summarized in Appendix F, Table K, using the four variables described in Tables 6.1-3, -4, -5, and -7. These variables indicate expected habitat condition following fifty years of implementing each forest plan revision alternative.

Ratings of risk to viability for each species/habitat relationship by alternative are presented in Appendix F, Table L. To facilitate comparison of effects of alternatives on species viability, the number of very-high, high, and moderately-high risk ratings are summarized for each alternative by habitat element (Tables 6.1-8A-E), management effect (Tables 6.1-9A-E), and species status (Tables 6.1-10A-E).

Viability risk rating summaries indicate relatively small differences among alternatives relative to effects on species viability. This similarity results from planning efforts to include in all alternatives provisions to provide for species viability in compliance with NFMA regulations. Examples of such provisions common to all alternatives (except Alternative F, which represents the current forest plan) are the prescriptions for rare communities and riparian corridors. Similarity of viability outcomes among alternatives also results from the influence of external forest health threats, which represent serious risks to forest communities and associated species regardless of alternative. Differences among alternatives are also muted by the small scale of actions contemplated under all alternatives relative the more extensive effects to ecological systems that have occurred to national forest landscapes since European settlement. Broader scale effects will likely continue to have similar important effects to species viability regardless of which alternative is selected.

Management Area 1 – Bankhead National Forest

The Bankhead National Forest lies in the Southern Cumberland Plateau physiographic region. This represents the southwesterly extent of the Southern Appalachian ecoregion. Species viability evaluation for the Bankhead National Forest included consideration of 1368 species of the Southern Appalachian ecoregion. Of these species, 149 from the Southern Appalachian ecoregion are considered rare and are known to occur on Bankhead National Forest.

Table 6.1-8A. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each habitat element by forest plan revision alternative, Bankhead National Forest.

	Alternative						
Habitat Element/Risk	A	B	D	E	F	G	I
Bogs, Fens, Seeps, Seasonal Ponds							
Very High	7	7	7	7	7	7	7
High	2	2	2	2	2	2	2
Moderately High	1	1	1	1	1	1	1
Total	10	10	10	10	10	10	10
Open Wetlands							
Very High	2	2	2	2	2	2	2
High	1	1	1	1	1	1	1
Moderately High	1	1	1	1	1	1	1
Total	4	4	4	4	4	4	4
River Channels							
Very High	1	1	1	1	1	1	1
High	1	1	1	1	1	1	1
Moderately High	1	1	1	1	1	1	1
Total	3	3	3	3	3	3	3
Glades and Barrens							
Very High	0	0	0	0	0	0	0
High	12	12	12	12	12	12	12
Moderately High	2	2	2	2	2	2	2
Total	14	14	14	14	14	14	14
Basic Mesic Forests							
Very High	0	0	0	0	12	0	0
High	12	12	12	12	4	12	12
Moderately High	4	4	4	4	1	4	4
Total	16	16	16	16	17	16	16
Rock Outcrops and Cliffs							
Very High	0	0	0	0	0	0	0
High	20	20	20	20	20	20	20
Moderately High	5	5	5	5	5	5	5
Total	25	25	25	25	25	25	25

Spray Cliffs							
Very High	0	0	0	0	0	0	0
High	10	10	10	10	10	10	10
Moderately High	2	2	2	2	2	2	2
Total	12	12	12	12	12	12	12
Canebrakes							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Caves and Mines							
Very High	2	2	2	2	2	2	2
High	2	2	2	2	2	2	2
Moderately High	1	1	1	1	1	1	1
Total	5	5	5	5	5	5	5
Mature Mesic Hardwood Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	24	24	24	24	24	24	24
Total	24	24	24	24	24	24	24
Mature Hemlock Forests							
Very High	16	16	16	16	16	16	16
High	1	1	1	1	1	1	1
Moderately High	1	1	1	1	1	1	1
Total	18	18	18	18	18	18	18
Mature Oak Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	6	6	6	6	6	6	6
Total	6	6	6	6	6	6	6
Mature Yellow Pine Forests							
Very High	5	5	5	0	0	0	0
High	0	0	0	5	5	5	5
Moderately High	1	1	1	0	0	0	0
Total	6	6	6	5	5	5	5
Early-Successional Forests							
Very High	0	0	0	0	0	4	0
High	0	0	0	4	0	1	0
Moderately High	4	4	4	1	4	1	4
Total	4	4	4	5	4	6	4
Mature Forest Interiors							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	3	3	3	3	3	3	3
Total	3	3	3	3	3	3	3
Canopy Gaps							
Very High	0	0	0	0	0	0	0
High	0	0	3	0	0	0	0
Moderately High	3	3	0	3	3	3	3
Total	3	3	3	3	3	3	3

Woodlands, Savannas, and Grasslands							
Very High	10	0	10	0	10	0	0
High	2	0	2	10	2	10	10
Moderately High	1	10	1	2	1	2	2
Total	13	10	13	12	13	12	12
Cedar Woodlands							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Mixed Landscapes							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	3	3	3	3	3	3	3
Total	3	3	3	3	3	3	3
Late Successional Riparian							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	35	35	35	35	35	35	35
Total	35	35	35	35	35	35	35
Early-Successional Riparian							
Very High	4	4	4	4	4	4	4
High	1	1	1	1	1	1	1
Moderately High	1	1	1	1	1	1	1
Total	6	6	6	6	6	6	6
Snags							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	2	2	2	2	2	2	2
Total	2	2	2	2	2	2	2
Downed Wood							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	6	6	6	6	6	6	6
Total	6	6	6	6	6	6	6
Den Trees							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	1	1	1	1	1	1	1
Total	1	1	1	1	1	1	1
Hard Mast							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Remoteness							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Lakeshores							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Water Quality							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	3	3	3	3	3	3	3
Total	3	3	3	3	3	3	3
All Habitat Elements							
Very High	47	37	47	32	54	36	32
High	64	62	67	81	61	78	77
Moderately High	111	120	108	108	107	108	111
Total	222	219	222	221	222	222	220

Evaluation results indicate, under all alternatives, high levels of risk to species viability are associated with certain key habitats (Table 6.1-8A). Highest levels of risk are associated with 1) mature hemlock forests, 2) woodlands, savannas, and grasslands, 3) and bogs, fens, seeps and seasonal ponds. Highest levels of risk are minimized on Bankhead Management Unit by Alternatives E and I.

Mature hemlock forests are critical to maintaining species viability because they are naturally limited to the riparian areas and canyons of Bankhead National Forest, and represent the edge of range for many associated species. They therefore support large numbers of species of potential viability concern. While their distribution may be somewhat reduced over historical conditions, the biggest threats to this community and associated species are impacts from further conversion of remnants of the forest type on private property, and the possibility of future hemlock wooly adelgid infestation. Mature hemlock forests are provided optimal protection and management under the rare community (9F) and canyon corridor (4L) prescription, external threats are more likely to determine the fate of this community and viability of associated species. Little opportunity for reducing risks through typical national forest management is apparent under any alternative.

Woodlands, savannas and grasslands are critical to maintaining species viability due to their present rarity on the landscape, their decline following European settlement due to fire suppression and land use conversion, and their unusual structure and species composition complexes. Several vascular plants, reptiles, birds, and insects of viability concern are associated with the open, park-like structure and herbaceous layer of woodland and savanna communities. Highest levels of risk are produced by Alternatives A, D, and F. Opportunities for woodland restoration occur in Alternatives B, E, G and I.

Bogs, fens, seeps, and seasonal ponds are critical to maintaining species viability due to their natural rarity on the landscape, their decline during European settlement due to beaver control and drainage for agriculture, and the number of rare species associated with them. Provisions of the rare community prescription provide for optimal protection and management of all occurrences of these habitats under all alternatives except

Alternative F; therefore, opportunities for further reducing risk to viability of associated species are limited. Under Alternative F such habitats would likely be maintained, but would not receive the focused attention provided by the rare community prescription.

Table 6.1-9A. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each category of management effect by forest plan revision alternative, Bankhead National Forest.

	Alternative						
Management Effect/Risk	A	B	D	E	F	G	I
Provide Optimal Protection and Management for All Habitat Occurrences							
Very High	12	12	12	12	2	12	12
High	60	60	60	60	2	60	60
Moderately High	20	20	20	20	4	20	20
Total	92	92	92	92	8	92	92
Improve Habitat Abundance and Distribution Through Restoration							
Very High	9	9	9	4	4	4	4
High	1	1	4	16	6	16	16
Moderately High	42	58	15	45	41	45	43
Total	52	68	28	65	51	65	63
Maintain Habitat Abundance and Distribution							
Very High	10	0	10	0	32	0	0
High	2	0	2	0	52	0	0
Moderately High	48	41	39	41	61	41	47
Total	60	41	51	41	145	41	47
Reduce Habitat Abundance and Distribution as Result of External Factors							
Very High	16	16	16	16	16	16	16
High	1	1	1	1	1	1	1
Moderately High	1	1	1	1	1	1	1
Total	18	18	18	18	18	18	18
Decline in Habitat Abundance and Distribution as Result of Management							
Very High	0	0	0	0	0	4	0
High	0	0	0	4	0	1	0
Moderately High	0	0	33	1	0	1	0
Total	0	0	33	5	0	6	0
Total for All Management Effect Categories							
Very High	47	37	47	32	54	36	32
High	64	62	67	81	61	78	77
Moderately High	111	120	108	108	107	108	111
Total	222	219	222	221	222	222	220

Despite similarities, some differences in effects of alternatives are apparent (Table 6.1-9A). Alternative I optimizes management effects to viability concern species by providing optimal protection to 92 species/habitat relationships and improving habitat and abundance and distribution through restoration to 20 very-high, and high risk species/habitat relationships. Alternative D results in greater risk to more species than other alternatives primarily because of its focus on establishing balanced age-class distributions. This focus results in reduced distribution and abundance of older forests and the diverse structure they provide. Additional risks are incurred from the reduced distribution of mature mesic hardwoods, mature oak forests, and mature forest interior habitats, also as a result of achieving balanced age-class distributions.

Of key interest are habitats elements that are both associated with high risk to species viability, and for which management can reduce risk by improving abundance and distribution. Alternatives D, E, and G would reduce habitat elements with high-risk species relationships as a direct result of management (Table 6.1-9A). Under Alternative D, these associations involve mature mesic hardwood forests, mature oak forests, and mature forest interiors. Under Alternative E and G, these associations involve early successional forests habitats. Other alternatives are expected to maintain or increase levels of these habitat elements.

Planning for, and evaluation of, species viability for forest plan revision has focused primarily on providing desired abundance and distribution of habitat elements, in compliance with NFMA regulations. Risks to species viability can be much reduced by additional provisions present in existing law and policy. These include specific consideration of effects to federally-listed threatened and endangered species, those proposed for such listing, and Regional Forester's Sensitive Species, in biological assessments and evaluations conducted as part of all national forest management decisions. These assessments and evaluations identify where additional protective measures are warranted to provide for continued existence of the species on national forest land. Projects that may affect federally listed or proposed species must be coordinated with the US Fish and Wildlife Service. In support of these requirements, these species are also often the focus of inventory and monitoring efforts. Additional species-based provisions included in all forest plan revision alternatives supplement existing law and policy. All alternatives include general and species-specific provisions for federally listed species, developed through coordinated planning with the US Fish and Wildlife Service.

Table 6.1-10A. Number of species/habitat relationships rated very high, high, and moderately high risk to terrestrial species viability for each category of species status by forest plan revision alternative, Bankhead National Forest.

	Alternative						
Species Status/Viability Risk	A	B	D	E	F	G	I
Federally Listed or Proposed as Threatened or Endangered							
Very High	3	3	3	3	3	3	3
High	1	1	1	1	1	1	1
Moderately High	6	6	6	6	6	6	6
Total	10	10	10	10	10	10	10

Regional Forester's Sensitive Species							
Very High	5	4	5	4	6	4	4
High	13	13	13	14	12	14	14
Moderately High	14	15	14	14	14	14	14
Total	32	32	32	32	32	32	32
Locally Rare and Other Species							
Very High	39	30	39	25	45	29	25
High	50	48	53	66	48	63	62
Moderately High	91	99	88	88	87	88	91
Total	180	177	180	179	180	180	178
Total for All Species Status Categories							
Very High	47	37	47	32	54	36	32
High	64	62	67	81	61	78	77
Moderately High	111	120	108	108	107	108	111
Total	222	219	222	221	222	222	220

All Alternatives are equal with regard to federally-listed, species associations. Alternatives E and I result in fewer very-high risk species associations among Regional Forester's Sensitive Species, compared to the remaining alternatives. Overall, Alternatives B and I optimize locally rare species' risk associations.

Management Area 2 – Conecuh National Forest

Conecuh National Forest is in the Lower East Gulf Coastal Plain, bordering the state of Florida. Species viability evaluation for the Conecuh National Forest included consideration of 199 species of the Coastal Plain. Of these species, 115 from the Coastal Plain are considered rare and are known to occur on Conecuh National Forest.

Table 6.1-8B. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each habitat element by forest plan revision alternative, Conecuh National Forest.

	Alternative						
Habitat Element/Risk	A	B	D	E	F	G	I
Bogs, Fens, Seeps, Seasonal Ponds							
Very High	34	34	34	34	34	34	34
High	6	6	6	6	6	6	6
Moderately High	3	3	3	3	3	3	3
Total	43	43	43	43	43	43	43
Open Wetlands							
Very High	0	0	0	0	0	0	0
High	13	13	13	13	13	13	13
Moderately High	2	2	2	2	2	2	2
Total	15	15	15	15	15	15	15
River Channels							

Very High	1	1	1	1	1	1	1
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	1	1	1	1	1	1	1
Canebrakes							
Very High	3	3	3	3	3	3	3
High	0	0	0	0	0	0	0
Moderately High	1	1	1	1	1	1	1
Total	4	4	4	4	4	4	4
Baygalls and Bayheads							
Very High	0	0	7	0	0	0	0
High	7	7	3	7	7	7	7
Moderately High	3	3	1	3	3	3	3
Total	10	10	11	10	10	10	10
Coastal Plain Ponds and Swamps							
Very High	27	27	27	27	27	27	27
High	6	6	6	6	6	6	6
Moderately High	3	3	3	3	3	3	3
Total	36	36	36	36	36	36	36
Sandhills							
Very High	0	0	0	0	0	0	0
High	4	4	4	4	4	4	4
Moderately High	1	1	1	1	1	1	1
Total	5	5	5	5	5	5	5
Wet Savannas and Flatwoods							
Very High	0	0	0	0	0	0	0
High	48	48	48	48	48	48	48
Moderately High	7	7	7	7	7	7	7
Total	55	55	55	55	55	55	55
Mature Mesic Hardwood Forests							
Very High	0	0	0	0	0	0	0
High	1	1	1	1	1	1	1
Moderately High	1	1	1	1	1	1	1
Total	2	2	2	2	2	2	2
Mature Oak Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Mature Yellow Pine Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Longleaf Pine Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	6	6	6	6	6	6	6
Total	6	6	6	6	6	6	6
Early-Successional Forests							

Very High	0	0	0	0	0	1	0
High	0	0	0	1	0	0	0
Moderately High	1	1	1	0	1	1	1
Total	1	1	1	1	1	2	1
Mature Forest Interiors							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Canopy Gaps							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Woodlands, Savannas, and Grasslands							
Very High	5	0	5	0	5	0	0
High	3	0	3	5	3	5	5
Moderately High	3	5	3	3	3	3	3
Total	11	5	11	8	11	8	8
Mixed Landscapes							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Late Successional Riparian							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	3	3	3	3	3	3	3
Total	3	3	3	3	3	3	3
Early-Successional Riparian							
Very High	3	3	3	3	3	3	3
High	1	1	1	1	1	1	1
Moderately High	1	1	1	1	1	1	1
Total	5	5	5	5	5	5	5
Snags							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Downed Wood							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Den Trees							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	1	1	1	1	1	1	1
Total	1	1	1	1	1	1	1
Hard Mast							

Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Remoteness							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	1	1	1	1	1	1	1
Total	1	1	1	1	1	1	1
Lakeshores							
Very High	0	0	0	0	0	0	0
High	3	3	3	3	3	3	3
Moderately High	0	0	0	0	0	0	0
Total	3	3	3	3	3	3	3
Water Quality							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
All Habitat Elements							
Very High	73	68	80	68	73	69	68
High	92	89	88	95	92	94	94
Moderately High	37	39	35	36	37	37	37
Total	202	196	203	199	202	200	199

Despite similarities, some differences in effects of alternatives are apparent. Alternative A, D, and F result in greater risk to more species than other alternatives primarily because of its focus on forest production and establishing balanced age-class distributions. This focus results in reduced distribution and abundance of older forests and the diverse structure they provide. Additional risks are incurred from the reduced distribution of mature woodland and savanna complexes, also as a result of optimized forest productivity and achieving balanced age-class distributions. Alternatives A, D, and F show higher numbers of very-high risk species/habitat relationships than other alternatives. Alternatives B, E, and I provide mixes of habitats for the full range of species' needs.

Evaluation results indicate, under all alternatives, high levels of risk to species viability are associated with certain key habitats (Table 6.1-8B). Highest risks are associated with 1) bogs, fens, seeps, and seasonal ponds, 2) coastal plain ponds and swamps, and 3) wet savannas and flatwoods.

Bogs, fens, seeps, and seasonal ponds are critical to maintaining species viability due to their natural rarity on the landscape, their decline following European settlement due fire suppression, drainage, and land use conversion, and the number of rare species associated with them. Provisions of the rare community prescription provide for optimal protection and management of all occurrences of these habitats under all alternatives except Alternative F; therefore, opportunities for further reducing risk to viability of associated species are limited. Under Alternative F such habitats would likely be maintained, but would not receive the focused attention provided by the rare community prescription.

Coastal Plain ponds and swamps are critical to maintaining species viability due to their natural rarity on the landscape, their decline following European settlement due to drainage, fisheries management, and land use conversion, and the number of rare species associated with them. Provisions of the rare community prescription provide for optimal protection and management of all occurrences of these habitats under all alternatives except Alternative F; therefore, opportunities for further reducing risk to viability of associated species are limited. Under Alternatives D and F riparian protections include only streamside management zones, where the remaining alternatives apply the riparian corridor prescription. Under these alternatives (D and F) such habitats would likely be maintained, but would not receive the focused attention provided by the rare community prescription.

Wet savannas and flatwoods are critical to maintaining species viability due to their present rarity on the landscape, their decline following European settlement due to fire suppression and land use conversion, and their unusual structure and species composition complexes. However, these communities are naturally limited due to hydrologic characteristics required for community development. Several vascular plants, reptiles, birds, and insects of viability concern are associated with the open, park-like structure, volatile hydrologic regime, and herbaceous layer of wet savannas and flatwoods communities.

Table 6.1-9B. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each category of management effect by forest plan revision alternative, Conecuh National Forest.

	Alternative						
Management Effect/Risk	A	B	D	E	F	G	I
Provide Optimal Protection and Management for All Habitat Occurrences							
Very High	62	62	69	62	0	62	62
High	87	87	83	87	3	87	87
Moderately High	19	19	17	19	0	19	19
Total	168	168	169	168	3	168	168
Improve Habitat Abundance and Distribution Through Restoration							
Very High	6	6	6	6	3	6	6
High	2	2	1	7	1	7	7
Moderately High	5	16	4	7	3	13	14
Total	13	24	11	20	7	26	27
Maintain Habitat Abundance and Distribution							
Very High	5	0	5	0	67	0	0
High	3	0	3	0	88	0	0
Moderately High	13	4	7	10	33	4	4

Total	21	4	15	10	188	4	4
Reduce Habitat Abundance and Distribution as Result of External Factors							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Decline in Habitat Abundance and Distribution as Result of Management							
Very High	0	0	0	0	3	1	0
High	0	0	1	1	0	0	0
Moderately High	0	0	7	0	1	1	0
Total	0	0	8	1	4	2	0
Total for All Management Effect Categories							
Very High	73	68	80	68	73	69	68
High	92	89	88	95	92	94	94
Moderately High	37	39	35	36	37	37	37
Total	202	196	203	199	202	200	199

Of key interest are habitats elements that are both associated with high risk to species viability, and for which management can reduce risk by improving abundance and distribution. Alternatives D, E, F, and G would reduce habitat elements with high-risk species relationships as a direct result of management (Table 6.1-9B). Under Alternative D, these associations involve mature mesic hardwood forests and mature longleaf pine forests. Under Alternative F, these associations involve canebrake communities. Under Alternative G, these associations involve early successional forest communities. Alternatives B, E, G, and I, will benefit the highest number of high-risk species associations.

Planning for, and evaluation of, species viability for forest plan revision has focused primarily on providing desired abundance and distribution of habitat elements, in compliance with NFMA regulations. Risks to species viability can be much reduced by additional provisions present in existing law and policy. These include specific consideration of effects to federally-listed threatened and endangered species, those proposed for such listing, and Regional Forester's Sensitive Species, in biological assessments and evaluations conducted as part of all national forest management decisions. These assessments and evaluations identify where additional protective measures are warranted to provide for continued existence of the species on national forest land. Projects that may affect federally listed or proposed species must be coordinated with the US Fish and Wildlife Service. In support of these requirements, these species are also often the focus of inventory and monitoring efforts. Additional species-based provisions included in all forest plan revision alternatives supplement existing law and policy. All alternatives include general and species-specific provisions for federally listed species, developed through coordinated planning with the US Fish and Wildlife Service.

Table 6.1-10B. Number of species/habitat relationships rated very high, high, and moderately high risk to terrestrial species viability for each category of species status by forest plan revision alternative, Conecuh National Forest.

	Alternative						
Species Status/Viability Risk	A	B	D	E	F	G	I
Federally Listed or Proposed as Threatened or Endangered							
Very High	1	1	1	1	1	1	1
High	2	2	2	2	2	2	2
Moderately High	2	2	2	2	2	2	2
Total	5	5	5	5	5	5	5
Regional Forester's Sensitive Species							
Very High	21	20	23	20	21	20	20
High	30	29	29	30	30	30	30
Moderately High	12	13	11	13	12	13	13
Total	63	62	63	63	63	63	63
Locally Rare and Other Species							
Very High	51	47	56	47	51	48	47
High	60	58	57	63	60	62	62
Moderately High	23	24	22	21	23	22	22
Total	134	129	135	131	134	132	131
Total for All Species Status Categories							
Very High	73	68	80	68	73	69	68
High	92	89	88	95	92	94	94
Moderately High	37	39	35	36	37	37	37
Total	202	196	203	199	202	200	199

All Alternatives are equal with regard to federally-listed, species associations. Alternatives B, E, G, and I result in fewer very-high risk species associations for Regional Forester's Sensitive Species, compared to the remaining alternatives. Overall, Alternative B optimizes locally rare list, while Alternatives E and I also result in fewer high-risk species/habitat associations, compared to remaining alternatives.

Management Area 3 – Oakmulgee Division, Talladega National Forest

The Oakmulgee Division lies at the edge of the Fall Line that demarcates the Upper Coastal Plain, in west central Alabama. The Oakmulgee management unit falls within the East Gulf Coastal Plain ecoregion. Species viability evaluation for the Oakmulgee Division of the Talladega National Forest included consideration of 199 species of the Alabama Coastal Plain. Of these species, 40 from the Alabama Coastal Plain are considered rare and are known to occur on Oakmulgee Division of the Talladega National Forest.

Table 6.1-8C. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each habitat element by forest plan revision alternative, Oakmulgee District of the Talladega National Forest.

	Alternative						
Habitat Element/Risk	A	B	D	E	F	G	I
Bogs, Fens, Seeps, Seasonal Ponds							
Very High	1	1	1	1	1	1	1
High	1	1	1	1	1	1	1
Moderately High	0	0	0	0	0	0	0
Total	2	2	2	2	2	2	2
Open Wetlands							
Very High	0	0	3	0	3	0	0
High	3	3	2	3	2	3	3
Moderately High	2	2	0	2	0	2	2
Total	5	5	5	5	5	5	5
River Channels							
Very High	2	2	2	2	2	2	2
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	2	2	2	2	2	2	2
Glades and Barrens							
Very High	0	0	0	0	0	0	0
High	1	1	1	1	1	1	1
Moderately High	0	0	0	0	0	0	0
Total	1	1	1	1	1	1	1
Canebrakes							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Baygalls and Bayheads							
Very High	0	0	3	0	0	0	0
High	3	3	0	3	3	3	3
Moderately High	0	0	0	0	0	0	0
Total	3	3	3	3	3	3	3
Coastal Plain Ponds and Swamps							
Very High	4	4	4	4	4	4	4
High	0	0	0	0	0	0	0
Moderately High	1	1	1	1	1	1	1
Total	5	5	5	5	5	5	5
Mature Mesic Hardwood Forests							
Very High	0	0	0	0	0	0	0
High	6	6	6	6	6	6	6
Moderately High	5	5	5	5	5	5	5
Total	11	11	11	11	11	11	11
Mature Oak Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Mature Yellow Pine Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Longleaf Pine Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	2	2	2	2	2	2	2
Total	2	2	2	2	2	2	2
Early-Successional Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	1	0
Total	0	0	0	0	0	1	0
Mature Forest Interiors							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Canopy Gaps							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Woodlands, Savannas, and Grasslands							
Very High	6	0	6	0	6	0	0
High	1	0	1	6	1	6	6
Moderately High	2	6	2	1	2	1	1
Total	9	6	9	7	9	7	7
Mixed Landscapes							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Late Successional Riparian							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	4	4	4	4	4	4	4
Total	4	4	4	4	4	4	4
Early-Successional Riparian							
Very High	2	2	2	2	2	2	2
High	2	2	2	2	2	2	2
Moderately High	0	0	0	0	0	0	0
Total	4	4	4	4	4	4	4
Snags							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Downed Wood							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Den Trees							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Hard Mast							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Remoteness							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Lakeshores							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Water Quality							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
All Habitat Elements							
Very High	15	9	21	9	18	9	9
High	17	16	13	22	16	22	22
Moderately High	16	20	14	15	14	16	15
Total	48	45	48	46	48	47	46

Alternative D results in greater risk to more species than other alternatives primarily because of its focus on establishing balanced age-class distributions. This focus results in reduced distribution and abundance of older forests and the diverse structure they provide. Alternatives D and F result in greater risk to species associated with wetland communities due to the lesser protections afforded to streamside management zones. The remaining alternatives include the greater protections of the riparian corridor prescription (11). Alternatives A, D and F show significantly higher numbers of very-high risk species/habitat relationships than other alternatives. Alternatives B, E, and I provide a more optimal mix of habitats for the full range of species' needs.

Evaluation results indicate, under all alternatives, high levels of risk to species viability are associated with certain key habitats (Table 6.1-8C). Highest risks are associated with 1) woodlands, savannas, and grasslands, 2) open wetlands, 3) coastal plain ponds and swamps, and 4.) mature mesic hardwood forests.

Woodlands, savannas and grasslands are critical to maintaining species viability due to their present rarity on the landscape, their decline following European settlement due to fire suppression and land use conversion, and their unusual structure and species composition complexes. Several vascular plants, reptiles, birds, and insects of viability concern are associated with the open, park-like structure and herbaceous layer of woodland and savanna communities. Opportunities for woodland restoration occur in Alternatives B, E, G and I.

Open wetlands are critical to maintaining species viability because they are naturally limited to small portions of the landscape in the upper coastal plain. They therefore support large numbers of species of potential viability concern. While their distribution may be reduced over historical conditions on surrounding privately owned landscapes, the biggest threats to this community on National Forest lands are drainage and sedimentation. Open wetlands are provided optimal protection and management under the Riparian prescription (11). Little opportunity for reducing risks or expanding late-successional riparian areas through typical national forest management is apparent under any alternative.

Coastal Plain ponds and swamps are critical to maintaining species viability due to their natural rarity on the landscape, their decline following European settlement due to drainage, fisheries management, and land use conversion, and the number of rare species associated with them. Provisions of the rare community prescription provide for optimal protection and management of all occurrences of these habitats under all alternatives except Alternative F; therefore, opportunities for further reducing risk to viability of associated species are limited. Under Alternatives D and F riparian protections include only streamside management zones, where the remaining alternatives apply the riparian corridor prescription. Under these alternatives (D and F) such habitats would likely be maintained, but would not receive the focused attention provided by the rare community prescription.

Mature mesic hardwood forests are critical to maintaining species viability because they are naturally limited to small portions of the landscape in Alabama by the combined effects of slope, aspect, soils, and natural disturbance and fire regimes. Historically, these habitats have been disproportionately converted to other land uses due to their fertility. The remaining mature mesic hardwood forests on National Forests therefore support large numbers of species of potential viability concern. While their distribution may be reduced over historical conditions on surrounding privately owned landscapes, the biggest threats to this community on National Forest lands are forest health risks. Opportunity for reducing risks or expanding mature mesic hardwood forest areas through national forest management is primarily through increasing rates of restoration where possible. Alternatives B and I emphasize restoration of native communities to the greatest extent; however, all alternatives except Alternative F include the restoration component.

Table 6.1-9C. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each category of management effect by forest plan revision alternative, Oakmulgee Ranger District of the Talladega National Forest.

	Alternative						
Management Effect/Risk	A	B	D	E	F	G	I
Provide Optimal Protection and Management for All Habitat Occurrences							
Very High	7	7	10	7	0	7	7
High	5	5	2	5	0	5	5
Moderately High	1	1	1	1	0	1	1
Total	13	13	13	13	0	13	13
Improve Habitat Abundance and Distribution Through Restoration							
Very High	2	2	5	2	5	2	2
High	11	11	4	17	4	17	17
Moderately High	7	15	0	8	0	10	10
Total	20	28	9	27	9	29	29
Maintain Habitat Abundance and Distribution							
Very High	6	0	6	0	13	0	0
High	1	0	1		12	0	0
Moderately High	8	4	6	6	14	4	4
Total	15	4	13	6	39	4	4
Reduce Habitat Abundance and Distribution as Result of External Factors							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Decline in Habitat Abundance and Distribution as Result of Management							
Very High	0	0	0	0	0	0	0
High	0	0	6	0	0	0	0
Moderately High	0	0	7	0	0	1	0
Total	0	0	13	0	0	1	0
Total for All Management Effect Categories							
Very High	15	9	21	9	18	9	9
High	17	16	13	22	16	22	22
Moderately High	16	20	14	15	14	16	15
Total	48	45	48	46	48	47	46

Of key interest are habitats elements that are both associated with high risk to species viability, and for which management can reduce risk by improving abundance and distribution. Alternative B, G, and I would benefit the largest number of high-risk species associations through restoration. Canebrake community-, woodlands, savannas and grassland complex community-, early-successional riparian forest community-, and mature mesic hardwood forest community-associations would be benefited by restoration in Alternatives B, E, and I.

Alternatives D and G would reduce habitat elements with high-risk species relationships as a direct result of management (Table 6.1-9). These associations involve mature mesic hardwood forests, mature longleaf pine forests, and the canebrake community. All other alternatives are expected to maintain or increase levels of these habitat elements.

Planning for, and evaluation of, species viability for forest plan revision has focused primarily on providing desired abundance and distribution of habitat elements, in compliance with NFMA regulations. Risks to species viability can be much reduced by additional provisions present in existing law and policy. These include specific consideration of effects to federally-listed threatened and endangered species, those proposed for such listing, and Regional Forester's Sensitive Species, in biological assessments and evaluations conducted as part of all national forest management decisions. These assessments and evaluations identify where additional protective measures are warranted to provide for continued existence of the species on national forest land. Projects that may affect federally listed or proposed species must be coordinated with the US Fish and Wildlife Service. In support of these requirements, these species are also often the focus of inventory and monitoring efforts. Additional species-based provisions included in all forest plan revision alternatives supplement existing law and policy. All alternatives include general and species-specific provisions for federally listed species, developed through coordinated planning with the US Fish and Wildlife Service.

Table 6.1-10C. Number of species/habitat relationships rated very high, high, and moderately high risk to terrestrial species viability for each category of species status by forest plan revision alternative, Oakmulgee Ranger District of the Talladega National Forest.

	Alternative						
Species Status/Viability Risk	A	B	D	E	F	G	I
Federally Listed or Proposed as Threatened or Endangered							
Very High	0	0	0	0	0	0	0
High	0	0	1	0	1	0	0
Moderately High	1	1	0	1	0	1	1
Total	1	1	1	1	1	1	1
Regional Forester's Sensitive Species							
Very High	4	3	7	3	6	3	3
High	4	4	1	5	2	5	5
Moderately High	5	6	5	5	5	5	5
Total	13	13	13	13	13	13	13
Locally Rare and Other Species							
Very High	11	6	14	6	12	6	6

High	13	12	11	17	13	17	17
Moderately High	10	13	9	9	9	10	9
Total	34	31	34	32	34	33	32
Total for All Species Status Categories							
Very High	15	9	21	9	18	9	9
High	17	16	13	22	16	22	22
Moderately High	16	20	14	15	14	16	15
Total	48	45	48	46	48	47	46

Alternatives D and F result in slightly higher risk to federally listed, species associations. Alternatives B, E, G, and I result in fewer very-high risk species associations, for both Regional Forester's Sensitive species, and to all species status categories, compared to the remaining alternatives. Overall, Alternative B optimizes Regional Forester's Sensitive Species list associations, and all species status categories. Alternatives G and I are also favorable to a majority of high-risk species/habitat associations.

Management Area 4 – Talladega Division, Talladega National Forest

The Talladega Division occurs on the southern edge of the Southern Ridge and Valley, with portions of its southern extent in the Piedmont physiographic region. This management unit falls within the Southern Appalachian ecoregion. Species viability evaluation for the Talladega Division of the Talladega National Forest included consideration of 1368 species of the Southern Appalachian ecoregion. Of these species, 199 from the Southern Appalachian ecoregion are considered rare and are known to occur on Talladega Division of the Talladega National Forest.

Table 6.1-8D. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each habitat element by forest plan revision alternative, Talladega Division of the Talladega National Forest.

	Alternative						
Habitat Element/Risk	A	B	D	E	F	G	I
Bogs, Fens, Seeps, Seasonal Ponds							
Very High	18	18	18	18	18	18	18
High	6	6	6	6	6	6	6
Moderately High	0	0	0	0	0	0	0
Total	24	24	24	24	24	24	24
Open Wetlands							
Very High	6	6	6	6	6	6	6
High	1	1	1	1	1	1	1
Moderately High	3	3	3	3	3	3	3
Total	10	10	10	10	10	10	10
River Channels							
Very High	6	6	6	6	6	6	6
High	2	2	2	2	2	2	2
Moderately High	0	0	0	0	0	0	0
Total	8	8	8	8	8	8	8

Glades and Barrens							
Very High	0	0	0	0	0	0	0
High	15	15	15	15	15	15	15
Moderately High	4	4	4	4	4	4	4
Total	19	19	19	19	19	19	19
Basic Mesic Forests							
Very High	0	0	0	0	18	0	0
High	18	18	18	18	5	18	18
Moderately High	5	5	5	5	0	5	5
Total	23	23	23	23	23	23	23
Rock Outcrops and Cliffs							
Very High	0	0	0	0	0	0	0
High	20	20	20	20	20	20	20
Moderately High	5	5	5	5	5	5	5
Total	25	25	25	25	25	25	25
Spray Cliffs							
Very High	0	0	0	0	0	0	0
High	2	2	2	2	2	2	2
Moderately High	1	1	1	1	1	1	1
Total	3	3	3	3	3	3	3
Canebrakes							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Caves and Mines							
Very High	0	0	0	0	0	0	0
High	1	1	1	1	1	1	1
Moderately High	0	0	0	0	0	0	0
Total	1	1	1	1	1	1	1
Mature Mesic Hardwood Forests							
Very High	0	0	0	0	0	0	0
High	34	34	34	34	34	34	34
Moderately High	17	17	17	17	17	17	17
Total	51	51	51	51	51	51	51
Mature Oak Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	20	20	20	20	20	20	20
Total	20	20	20	20	20	20	20
Mature Yellow Pine Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	5	5	5	5	5	5	5
Total	5	5	5	5	5	5	5
Mountain Longleaf Pine Forests							
Very High	0	0	0	0	0	0	0
High	0	0	7	0	0	0	0
Moderately High	7	7	2	7	7	7	7
Total	7	7	9	7	7	7	7

Early-Successional Forests							
Very High	0	0	0	0	0	2	0
High	0	0	0	2	0	1	0
Moderately High	2	2	2	1	2	2	2
Total	2	2	2	3	2	5	2
Mature Forest Interiors							
Very High	2	0	2	2	2	2	2
High	2	2	2	2	2	2	2
Moderately High	1	2	1	1	1	1	1
Total	5	4	5	5	5	5	5
Canopy Gaps							
Very High	0	0	0	0	0	0	0
High	8	8	8	8	8	8	8
Moderately High	3	3	3	3	3	3	3
Total	11	11	11	11	11	11	11
Woodlands, Savannas, and Grasslands							
Very High	28	0	28	0	28	0	0
High	10	0	10	28	10	28	28
Moderately High	4	28	4	10	4	10	10
Total	42	28	42	38	42	38	38
Cedar Woodlands							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Mixed Landscapes							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	4	4	4	4	4	4	4
Total	4	4	4	4	4	4	4
Late Successional Riparian							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	26	26	26	26	26	26	26
Total	26	26	26	26	26	26	26
Early-Successional Riparian							
Very High	11	11	11	11	11	11	11
High	2	2	2	2	2	2	2
Moderately High	0	0	0	0	0	0	0
Total	13	13	13	13	13	13	13
Snags							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	1	1	1	1	1	1	1
Total	1	1	1	1	1	1	1
Downed Wood							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	3	3	3	3	3	3	3
Total	3	3	3	3	3	3	3

Den Trees							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Hard Mast							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Remoteness							
Very High	1	1	1	1	1	1	1
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	1	1	1	1	1	1	1
Lakeshores							
Very High	0	0	0	0	0	0	0
High	2	2	2	2	2	2	2
Moderately High	0	0	0	0	0	0	0
Total	2	2	2	2	2	2	2
Water Quality							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
All Habitat Elements							
Very High	72	42	72	44	90	46	44
High	123	113	130	143	110	142	141
Moderately High	111	136	106	116	106	117	117
Total	306	291	308	303	306	305	302

Despite similarities, some differences in effects of alternatives are apparent. Alternatives A, D, and F result in greater risk to more species than other alternatives primarily because of their focus on commodity production and establishing balanced age-class distributions. This focus results in reduced distribution and abundance of older forests and the diverse structure they provide. Additional risks are incurred from the reduced distribution of mature mesic hardwood forests, mature oak forests, mature yellow pine forests, and mature mountain longleaf pine forests. These shifts would occur under Alternatives A, D, and F also as a result of the alternative's emphasis on producing forest products and achieving balanced age-class distributions. Alternatives A, D, and F show higher numbers of very-high risk species/habitat relationships than other alternatives. Alternatives B, E, and I provide a more optimal mix of habitats for the full range of species' needs.

Evaluation results indicate, under all alternatives, highest levels of risk to species viability are associated with certain key habitats (Table 6.1-8D). Highest risks are associated with 1) woodlands, savannas, and grasslands, 2) bogs, fens, seeps, seasonal ponds, 3) early-successional riparian, and 4) mature mesic hardwood forests.

Woodlands, savannas and grasslands are critical to maintaining species viability due to their present rarity on the landscape, their decline following European settlement due to fire suppression and land use conversion, and their unusual structure and species composition complexes. Several vascular plants, reptiles, birds, and insects of viability concern are associated with the open, park-like structure and herbaceous layer of woodland and savanna communities. Opportunities for woodland restoration occur in Alternatives B, E, G and I.

Bogs, fens, seeps, and seasonal ponds are critical to maintaining species viability due to their natural rarity on the landscape, their decline during European settlement due to beaver control and drainage for agriculture, and the number of rare species associated with them. Provisions of the rare community prescription provide for optimal protection and management of all occurrences of these habitats under all alternatives except Alternative F; therefore, opportunities for further reducing risk to viability of associated species are limited. Under Alternative F such habitats would likely be maintained, but would not receive the focused attention provided by the rare community prescription.

Early-successional riparian habitats are critical to maintaining species viability because they are fleeting in duration and limited on the landscape. Because early-seral riparian habitats combine herbaceous, shrub-scrub, or dense young forest structure with wet conditions they potentially support habitat specialists of potential viability concern. The distribution of herbaceous, shrub-scrub or young forest riparian habitats at the landscape scale is reduced over historical conditions due to land use conversion and development. Their distribution on national forest lands is also reduced as forests have matured, management protections have reduced regeneration in riparian habitats, and natural disturbance regimes such as fires, have been suppressed. Riparian communities are provided optimal protection and management under the Riparian prescription. Opportunity for restoring very limited early-successional riparian habitats through restoration exists under all alternatives, except Alternative F.

Mature mesic hardwood forests are critical to maintaining species viability because they are naturally limited to small portions of the landscape in Alabama by the combined effects of slope, aspect, soils, and natural disturbance and fire regimes. Historically, these habitats have been disproportionately converted to other land uses due to their fertility. The remaining mature mesic hardwood forests on National Forests therefore support large numbers of species of potential viability concern. While their distribution may be reduced over historical conditions on surrounding privately owned landscapes, the biggest threats to this community on National Forest lands are forest health risks. Opportunity for reducing risks or expanding mature mesic hardwood forest areas through national forest management is primarily through increasing rates of restoration where possible. Alternatives B and I emphasize restoration of native communities to the greatest extent; however, all alternatives except Alternative F include the restoration component.

Table 6.1-9C. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each category of management effect by forest plan revision alternative, Talladega Division of the Talladega National Forest.

	Alternative						
Management Effect/Risk	A	B	D	E	F	G	I
Provide Optimal Protection and Management for All Habitat Occurrences							
Very High	30	30	30	30	0	30	30
High	67	67	67	67	3	67	67
Moderately High	18	18	18	18	0	18	18
Total	115	115	115	115	3	115	115
Improve Habitat Abundance and Distribution Through Restoration							
Very High	13	11	11	13	11	13	13
High	46	46	2	74	2	74	74
Moderately High	27	88	6	55	6	67	49
Total	86	145	19	142	19	154	136
Maintain Habitat Abundance and Distribution							
Very High	29	1	29	1	79	1	1
High	10	0	10	0	105	0	0
Moderately High	66	30	34	42	100	30	50
Total	105	31	73	43	284	31	51
Reduce Habitat Abundance and Distribution as Result of External Factors							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Decline in Habitat Abundance and Distribution as Result of Management							
Very High	0	0	2	0	0	2	0
High	0	0	51	2	0	1	0
Moderately High	0	0	48	1	0	2	0
Total	0	0	101	3	0	5	0
Total for All Management Effect Categories							
Very High	72	42	72	44	90	46	44
High	123	113	130	143	110	142	141
Moderately High	111	136	106	116	106	117	117
Total	306	291	308	303	306	305	302

Alternative F provides optimal protection and restoration management to the fewest number of species/habitat relationships. Of key interest are habitats elements that are both associated with high risk to species viability, and for which management can reduce risk by improving abundance and distribution. Alternatives B, E, G, and I would allow restoration of significantly higher numbers of habitat elements associated with high-risk species relationships.

Alternative D, E and G would reduce habitat elements with high-risk species relationships as a direct result of management (Table 6.1-9D). Under Alternative D, these associations involve mature mesic hardwood forests, mature oak forests, mature yellow pine forests, and mature mountain longleaf forests. Under Alternatives E and G, these associations involve a lack of creation of early successional forests. All other alternatives are expected to maintain or increase levels of these habitat elements.

Planning for, and evaluation of, species viability for forest plan revision has focused primarily on providing desired abundance and distribution of habitat elements, in compliance with NFMA regulations. Risks to species viability can be much reduced by additional provisions present in existing law and policy. These include specific consideration of effects to federally listed threatened and endangered species, those proposed for such listing, and Regional Forester's Sensitive Species, in biological assessments and evaluations conducted as part of all national forest management decisions. These assessments and evaluations identify where additional protective measures are warranted to provide for continued existence of the species on national forest land. Projects that may affect federally listed or proposed species must be coordinated with the US Fish and Wildlife Service. In support of these requirements, these species are also often the focus of inventory and monitoring efforts. Additional species-based provisions included in all forest plan revision alternatives supplement existing law and policy. All alternatives include general and species-specific provisions for federally listed species, developed through coordinated planning with the US Fish and Wildlife Service.

Table 6.1-10D. Number of species/habitat relationships rated very high, high, and moderately high risk to terrestrial species viability for each category of species status by forest plan revision alternative, Talladega Division of the Talladega National Forest.

	Alternative						
Species Status/Viability Risk	A	B	D	E	F	G	I
Federally Listed or Proposed as Threatened or Endangered							
Very High	0	0	0	0	0	0	0
High	1	1	2	1	1	1	1
Moderately High	3	3	2	3	3	3	3
Total	4	4	4	4	4	4	4
Regional Forester's Sensitive Species							
Very High	10	4	10	4	13	4	4
High	23	22	24	28	20	28	28
Moderately High	11	17	10	12	11	12	12
Total	44	43	44	44	44	44	44
Locally Rare and Other Species							
Very High	62	38	62	40	77	42	40
High	99	90	104	114	89	113	112
Moderately High	97	116	94	101	92	102	102
Total	258	244	260	255	258	257	254

Total for All Species Status Categories							
Very High	72	42	72	44	90	46	44
High	123	113	130	143	110	142	141
Moderately High	111	136	106	116	106	117	117
Total	306	291	308	303	306	305	302

Alternative D has slightly higher risk species associations with regard to federally listed species. All remaining alternatives are equal with regard to federally listed, species associations. Alternatives B, E, G, and I result in fewer very-high risk species associations among Regional Forester's Sensitive Species and locally rare species, compared to the remaining alternatives. Overall, Alternative B optimizes Regional Forester's Sensitive Species list-, locally rare list-, and all species status category risk associations. Alternative I provides the second best species/habitat risk outcomes.

Management Area 5 – Tuskegee National Forest

The Tuskegee National Forest lies at the edge of the Fall Line that demarcates the Upper Coastal Plain, in east central Alabama. The Tuskegee management unit falls within the larger East Gulf Coastal Plain ecoregion. Species viability evaluation for the Tuskegee National Forest included consideration of 199 species of the Coastal Plain of Alabama. Of these species, 17 from the Coastal Plain of Alabama are considered rare and are known to occur on Tuskegee National Forest.

Table 6.1-8E. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each habitat element by forest plan revision alternative, Tuskegee National Forest.

	Alternative						
Habitat Element/Risk	A	B	D	E	F	G	I
Bogs, Fens, Seeps, Seasonal Ponds							
Very High	1	1	1	1	1	1	1
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	1	1	1	1	1	1	1
Open Wetlands							
Very High	2	2	2	2	2	2	2
High	2	2	2	2	2	2	2
Moderately High	0	0	0	0	0	0	0
Total	4	4	4	4	4	4	4
River Channels							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Canebrakes							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0

Total	0	0	0	0	0	0	0
Baygalls and Bayheads							
Very High	0	0	1	0	0	0	0
High	1	1	0	1	1	1	1
Moderately High	0	0	0	0	0	0	0
Total	1	1	1	1	1	1	1
Coastal Plain Ponds and Swamps							
Very High	1	1	1	1	1	1	1
High	0	0	0	0	0	0	0
Moderately High	2	2	2	2	2	2	2
Total	3	3	3	3	3	3	3
Mature Mesic Hardwood Forests							
Very High	0	0	0	0	0	0	0
High	3	3	3	3	3	3	3
Moderately High	1	1	1	1	1	1	1
Total	4	4	4	4	4	4	4
Mature Oak Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Mature Yellow Pine Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	1	1	1	1	1	1	1
Total	1	1	1	1	1	1	1
Longleaf Pine Forests							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Early-Successional Forests							
Very High	0	0	0	0	0	1	0
High	0	0	0	1	0	0	0
Moderately High	1	1	1	0	1	2	1
Total	1	1	1	1	1	3	1
Mature Forest Interiors							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	1	1	1	1	1
Total	0	0	1	1	1	1	1
Canopy Gaps							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Woodlands, Savannas, and Grasslands							
Very High	2	0	2	0	2	0	0
High	1	0	1	2	1	2	2
Moderately High	1	2	1	1	1	1	1

Total	4	2	4	3	4	3	3
Mixed Landscapes							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	1	1	1	1	1	1	1
Total	1	1	1	1	1	1	1
Late Successional Riparian							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	3	3	3	3	3	3	3
Total	3	3	3	3	3	3	3
Early-Successional Riparian							
Very High	1	1	1	1	1	1	1
High	0	0	0	0	0	0	0
Moderately High	1	1	1	1	1	1	1
Total	2	2	2	2	2	2	2
Snags							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Downed Wood							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Den Trees							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Hard Mast							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Remoteness							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Lakeshores							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Water Quality							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0

Total	0	0	0	0	0	0	0
All Habitat Elements							
Very High	7	5	8	5	7	6	5
High	7	6	6	9	7	8	8
Moderately High	11	12	12	11	12	13	12
Total	25	23	26	25	26	27	25

Alternatives A, D and F result in greater risk to more species than other alternatives primarily because of commodity production and balanced age-class distribution maintenance. This focus results in reduced distribution and abundance of older forests and the diverse structure they provide. Additional risks are incurred from the reduced distribution of mature mesic hardwood forests, mature yellow pine forests, and mature forest interior habitats, also as a result of achieving balanced age-class distributions. Alternatives B, E, G, and I show slightly lower numbers of very-high risk species/habitat relationships than other alternatives. This lower risk rating results from emphasis on restoring native communities, including woodland and savanna complexes.

Evaluation results indicate, under all alternatives, high levels of risk to species viability are associated with certain key habitats (Table 6.1-8E). Highest risks are associated with 1) woodlands, savannas, and grassland complexes; 2) coastal plain ponds and swamps; 3) open wetlands; and 4) mature mesic hardwood forests.

Woodlands, savannas and grasslands are critical to maintaining species viability due to their present rarity on the landscape, their decline following European settlement due to fire suppression and land use conversion, and their unusual structure and species composition complexes. Several vascular plants, reptiles, birds, and insects of viability concern are associated with the open, park-like structure and herbaceous layer of woodland and savanna communities. Opportunities for woodland restoration occur in Alternatives B, E, G and I.

Coastal Plain ponds and swamps and open wetlands are critical to maintaining species viability due to their natural rarity on the landscape, their decline following European settlement due to drainage, fisheries management, and land use conversion, and the number of rare species associated with them. Provisions of the rare community prescription provide for optimal protection and management of all occurrences of these habitats under all alternatives except Alternative F; therefore, opportunities for further reducing risk to viability of associated species are limited. Under Alternatives D and F riparian protections include only streamside management zones, where the remaining alternatives apply the riparian corridor prescription. Under these alternatives (D and F) such habitats would likely be maintained, but would not receive the focused attention provided by the rare community prescription.

Mature mesic hardwood forests are critical to maintaining species viability because they are naturally limited to small portions of the landscape in Alabama by the combined effects of slope, aspect, soils, and natural disturbance and fire regimes. Historically, these habitats have been disproportionately converted to other land uses due to their fertility. The remaining mature mesic hardwood forests on National Forests therefore support large numbers of species of potential viability concern. While their distribution may be reduced over historical conditions on surrounding privately owned landscapes, the biggest threats to this community on National Forest lands are forest health risks. Opportunity for reducing risks or expanding mature mesic hardwood forest areas through national forest management is primarily through increasing rates of restoration where possible. Alternatives B and I emphasize restoration of native communities to the greatest extent; however, all alternatives except Alternative F include the restoration component.

Table 6.1-9E. Number of species/habitat relationships rated as very high, high, and moderately high risk to terrestrial species viability for each category of management effect by forest plan revision alternative, Tuskegee National Forest.

	Alternative						
Management Effect/Risk	A	B	D	E	F	G	I
Provide Optimal Protection and Management for All Habitat Occurrences							
Very High	4	4	5	4	0	4	4
High	3	3	2	3	0	3	3
Moderately High	2	2	2	2	0	2	2
Total	9	9	9	9	0	9	9
Improve Habitat Abundance and Distribution Through Restoration							
Very High	1	1	1	1	1	1	1
High	3	3	0	5	0	5	5
Moderately High	3	6	2	4	2	5	6
Total	7	10	3	10	3	11	12
Maintain Habitat Abundance and Distribution							
Very High	2	0	2	0	6	0	0
High	1	0	1	0	7	0	0
Moderately High	6	4	5	5	10	4	4
Total	9	4	8	5	23	4	4
Reduce Habitat Abundance and Distribution as Result of External Factors							
Very High	0	0	0	0	0	0	0
High	0	0	0	0	0	0	0
Moderately High	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Decline in Habitat Abundance and Distribution as Result of Management							
Very High	0	0	0	0	0	1	0
High	0	0	3	1	0	0	0
Moderately High	0	0	3	0	0	2	0
Total	0	0	6	1	0	3	0
Total for All Management Effect Categories							
Very High	7	5	8	5	7	6	5
High	7	6	6	9	7	8	8
Moderately High	11	12	12	11	12	13	12

	A	B	D	E	F	G	I
Total	25	23	26	25	26	27	25

Of key interest are habitats elements that are both associated with high risk to species viability, and for which management can reduce risk by improving abundance and distribution. For the Tuskegee these include woodlands, savannas and grassland complexes, canebrakes, mature mesic hardwood forests, and early successional forests. The number of high risk species associations potentially benefited by restoration is maximized under Alternatives B, E, G, and I.

Alternatives D, E, and G would reduce habitat elements with high-risk species relationships as a direct result of management (Table 6.1-9E). Under Alternative D, these associations involve mature mesic hardwood forests, mature yellow pine forests, and mature forest interiors. Under Alternatives E and G these associations involve a lack of creation of early successional forest habitats. Under Alternative F the canebrake association is not an object of restoration, resulting in several high-risk associations. All other alternatives are expected to maintain or increase levels of these habitat elements.

Planning for, and evaluation of, species viability for forest plan revision has focused primarily on providing desired abundance and distribution of habitat elements, in compliance with NFMA regulations. Risks to species viability can be much reduced by additional provisions present in existing law and policy. These include specific consideration of effects to federally-listed threatened and endangered species, those proposed for such listing, and Regional Forester's Sensitive Species, in biological assessments and evaluations conducted as part of all national forest management decisions. These assessments and evaluations identify where additional protective measures are warranted to provide for continued existence of the species on national forest land. Projects that may affect federally listed or proposed species must be coordinated with the US Fish and Wildlife Service. In support of these requirements, these species are also often the focus of inventory and monitoring efforts. Additional species-based provisions included in all forest plan revision alternatives supplement existing law and policy. All alternatives include general and species-specific provisions for federally listed species, developed through coordinated planning with the US Fish and Wildlife Service.

Table 6.1-10E. Number of species/habitat relationships rated very high, high, and moderately high risk to terrestrial species viability for each category of species status by forest plan revision alternative, Tuskegee National Forest.

	Alternative						
Species Status/Viability Risk	A	B	D	E	F	G	I
Federally Listed or Proposed as Threatened or Endangered							
Very High	0	0	0	0	0	0	0
High	1	1	1	1	1	1	1
Moderately High	0	0	0	0	0	0	0
Total	1	1	1	1	1	1	1

Regional Forester's Sensitive Species							
Very High	3	2	4	2	3	3	2
High	1	1	0	3	1	2	2
Moderately High	1	2	1	0	1	0	1
Total	5	5	5	5	5	5	5
Locally Rare and Other Species							
Very High	4	3	4	3	4	3	3
High	5	4	5	5	5	5	5
Moderately High	10	10	11	11	11	13	11
Total	19	17	20	19	20	21	19
Total for All Species Status Categories							
Very High	7	5	8	5	7	6	5
High	7	6	6	9	7	8	8
Moderately High	11	12	12	11	12	13	12
Total	25	23	26	25	26	27	25

All Alternatives are equal with regard to federally-listed, species associations. Alternatives B, E, and I result in fewer very-high species associations, compared to the remaining alternatives for Regional Forester's sensitive species and all species status categories. Overall, Alternatives B, E, and I optimize risks to rare species/habitat associations.

Summarized results for National Forests in Alabama

The scale for this assessment is set by NFMA regulations as the "planning area," or the area of the National Forest System covered by a single forest plan. All of the management units in National Forests in Alabama are under a single forest plan. Risk assessment was further split where national forest units under the same forest plan occur in different ecoregions, or are widely separated geographically. There are five separate management units on National Forests in Alabama that are geographically separated from each other. The Bankhead National Forest lies in the Southern Cumberland Plateau. The Talladega Division occurs on the southern edge of the Southern Ridge and Valley, with portions of its southern extent in the Piedmont physiographic region. These two management units fall within the Southern Appalachian ecoregion. The Oakmulgee Division and Tuskegee National Forest lie at the edge of the Fall Line that demarcates the Upper Coastal Plain. Oakmulgee Division is in west central Alabama, and Tuskegee is in east central Alabama. Conecuh National Forest is in the Lower Coastal Plain physiographic region, bordering the state of Florida. The Oakmulgee, Tuskegee and Conecuh management units fall within the East Gulf Coastal Plain ecoregion. Although each management unit's risk assessment was separate, viability evaluation was coordinated across management units and across the ecoregions. Analysis presented here focuses on information relevant to the five management units of the National Forests in Alabama, collectively.

Trends in alternative effects are remarkably similar across management units. Alternatives B, E, G and I consistently produced the lowest number of very-high species risk associations, across all management units. Alternative B consistently produced the lowest overall number of high risk species associations, across all management units. Alternatives D and F (followed by Alternative A) produced the highest number of high risk species associations. However, the relative differences were often very small.

In conclusion, differences in effects to viability risk among alternatives are relatively small. High- risk species/habitat relationships are primarily a result of historical influences that have reduced distribution and abundance of some habitat elements and/or species populations. Future impacts from forest health threats also influenced high-risk species habitat relationships. In general, effects of proposed management strategies are small relative to historical impacts and future external threats. In general, risks to species viability are minimized by forest plan revision alternatives that provide a balanced mix of low-disturbance and disturbance-dependent habitat elements. Some elements in this mix are best provided through passive management and protection, while others require active management for restoration and maintenance.

Slight differences in results presented here from those in the DEIS are primarily the result of updates to species' status information (F Ranks) made during the comment period through review and coordination with NatureServe and their contractors. Additional changes are the result of adding species inadvertently omitted from the DEIS, and, in some cases, adjustments to habitat condition variables based on further analysis and interdisciplinary review. These adjustments have not resulted in substantial changes to overall patterns of risk, or conclusions relative to overall effects of alternatives. It is important to note that information on the status and ecology of this great diversity of species is constantly changing and will continue to do so as the revised forest plan is implemented. Lists of species of viability concern and related information will be maintained and updated as part of plan implementation; however, this updating will typically be small and incremental, and is not expected to change the overall conclusions of this analysis during this planning period.

Literature Cited

Wear, D.N. and J.G. Greis, eds. 2002. Southern Forest Resource Assessment. Gen. Tech. Rep. SRS-53. Asheville, NC: US Department of Agriculture. Forest Service, Southern Research Station. 635 pp.

Table K: Key to Variables	Summary of Expected Abundance, Distribution, Likelihood of Limitation, and Management Effects for Habitat Elements by Forest Plan Revision Alternatives

Habitat Abundance	Values used to categorize projected abundance of each habitat element after 50 years of implementing each forest plan revision alternative.
Code Description	
R	Rare. The habitat element is rare, with generally less than 100 occurrences, or patches of the element generally covering less than 1 percent of the planning area.
C	Common. The habitat element is abundant and frequently encountered, and generally found on more than 10 percent of the planning area.
O	Occasional. The habitat element is encountered occasionally, and generally found on 1 to 10 percent of the planning area.

Habitat Distribution	Values used to categorize projected distribution of each habitat element after 50 years of implementing each forest plan revision alternative.
Code Description	
P	Poor. The habitat element is poorly distributed within the planning area and intermixed lands relative to conditions present prior to European settlement. Number and size of high quality habitat patches is greatly reduced.
F	Fair. The habitat element is fairly well distributed within the planning area and intermixed lands relative to conditions present prior to European settlement. Number and size of high quality habitat patches is somewhat reduced.
G	Good. The habitat element is well distributed within the planning area and intermixed lands relative to conditions present prior to European settlement. Number and size of high quality habitat patches is similar to or only slightly reduced relative to reference conditions.

Likelihood of Limitation	General likelihood that the habitat element will be limiting to viability of associated species based on its abundance and distribution. See text for description of process used to determine likelihood of limitation.
Code Description	
L	Low
M	Moderate
H	High

Table K: Key to Variables (Continued)	Summary of Expected Abundance, Distribution, Likelihood of Limitation, and Management Effects for Habitat Elements by Forest Plan Revision Alternatives

Management Effect	Values used to categorize the role of management effects on each habitat element for each forest plan revision alternative.
Code Description	
1	Abundance and distribution of the habitat element is maintained or improved by providing optimal protection, maintenance, and restoration to all occurrences (with limited exceptions in some cases). Little additional opportunity exists to decrease risk to viability of associated species because management is at or near optimal.
2	Abundance and distribution of the habitat element is improved through purposeful restoration, either through active management or passively by providing for successional progression. Opportunity for decreasing risk to associated species is primarily through increasing rates of restoration, where possible.
3	The habitat element is maintained at approximately current distribution and abundance, though location of elements may shift over time as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to increase abundance and distribution of the habitat element.
4	Regardless of management efforts, the habitat element is expected to decrease in distribution and abundance as a result of factors substantially outside of Forest Service control (e.g., invasive pests, acid deposition). Opportunity to reduce risk to viability of associated species is primarily through cooperative ventures with other agencies and organizations.
5	The habitat element is expected to decrease in distribution and abundance as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to maintain or increase this habitat element.

Appendix F, Table K-A. Summary of expected abundance, distribution, likelihood of limitation, and management effects for habitat elements by forest plan revision alternatives.

Forest Unit: Bankhead

	Alternative						
Habitat Elements	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Bogs, Fens, Seeps, Seasonal Ponds							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Open Wetlands							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
River Channels							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Glades and Barrens							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Basic Mesic Forests							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	F	G	G
Likelihood of Limitation	M	M	M	M	H	M	M
Management Effects	1	1	1	1	3	1	1
Rock Outcrops and Cliffs							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Spray Cliffs							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1

Canebrakes							
Abundance	R	R	R	R	R	R	R
Distribution	P	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	5	2	2
Caves and Mines							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	1	1	1
Mature Mesic Hardwood Forests							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	5	2	2	2	2
Mature Hemlock Forests							
Abundance	R	R	R	R	R	R	R
Distribution	P	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	4	4	4	4	4	4	4
Mature Oak Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	2	5	2	3	2	3
Mature Yellow Pine Forests							
Abundance	O	O	O	O	O	O	O
Distribution	P	P	P	F	F	F	F
Likelihood of Limitation	H	H	H	M	M	M	M
Management Effects	2	2	2	2	2	2	2
Early-Successional Forests							
Abundance	O	O	C	O	O	R	O
Distribution	G	G	G	F	G	F	G
Likelihood of Limitation	L	L	L	M	L	H	L
Management Effects	2	2	2	5	2	5	2
Mature Forest Interiors							
Abundance	C	C	C	C	C	C	C
Distribution	F	G	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	5	3	3	3	3
Canopy Gaps							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	P	F	F	F	F
Likelihood of Limitation	L	L	M	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Woodlands, Savannas, and Grasslands							

Abundance	R	O	R	O	R	O	O
Distribution	P	G	P	F	P	F	F
Likelihood of Limitation	H	L	H	M	H	M	M
Management Effects	3	2	3	2	3	2	2
Cedar Woodlands							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Mixed Landscapes							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Late Successional Riparian							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Early-Successional Riparian							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	2	2	2
Snags							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Downed Wood							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Den Trees							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Hard Mast							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Remoteness							
Abundance	O	O	O	O	O	O	O

Distribution	P	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	3	3	3	3	3	3	3
Lakeshores							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	1	1	1
Water Quality							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	1	1	1	1	1	1	1

Appendix F, Table K-B. Summary of expected abundance, distribution, likelihood of limitation, and management effects for habitat elements by forest plan revision alternatives.

Forest Unit: Conecuh

	Alternative						
Habitat Elements	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Bogs, Fens, Seeps, Seasonal Ponds							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Open Wetlands							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1
River Channels							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Canebrakes							
Abundance	R	R	R	R	R	R	R
Distribution	P	F	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	5	2	2
Baygalls and Bayheads							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	F	G	G	G	G
Likelihood of Limitation	M	M	H	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Coastal Plain Ponds and Swamps							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Sandhills							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1

Wet Savannas and Flatwoods							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Mature Mesic Hardwood Forests							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	2	2	5	2	3	2	2
Mature Oak Forests							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	3	5	5	3	3	3	5
Mature Yellow Pine Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	G	F	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	2	5	3	3	2	2
Longleaf Pine Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	G	F	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	2	5	3	3	2	2
Early-Successional Forests							
Abundance	O	O	C	O	O	R	O
Distribution	G	G	G	F	G	F	G
Likelihood of Limitation	L	L	L	M	L	H	L
Management Effects	2	2	2	5	2	5	2
Mature Forest Interiors							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	p	p	p	p	p
Likelihood of Limitation	M	M	H	H	H	H	H
Management Effects	2	2	5	2	3	2	2
Canopy Gaps							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	2	2	5	2	3	2	2
Woodlands, Savannas, and Grasslands							
Abundance	R	O	R	O	R	O	O
Distribution	P	G	P	F	P	F	F
Likelihood of Limitation	H	L	H	M	H	M	M
Management Effects	3	2	3	2	3	2	2
Mixed Landscapes							

Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Late Successional Riparian							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Early-Successional Riparian							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	2	2	2
Snags							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Downed Wood							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Den Trees							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Hard Mast							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Remoteness							
Abundance	O	O	O	O	O	O	O
Distribution	P	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	3	3	3	3	3	3	3

Lakeshores							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	1	1	1
Water Quality							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	1	1	1	1	1	1	1

Appendix F, Table K-C. Summary of expected abundance, distribution, likelihood of limitation, and management effects for habitat elements by forest plan revision alternatives.

Forest Unit: Oakmulgee Division of Talladega

	Alternative						
Habitat Elements	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Bogs, Fens, Seeps, Seasonal Ponds							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Open Wetlands							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	F	G	F	G	G
Likelihood of Limitation	M	M	H	M	H	M	M
Management Effects	2	2	2	2	2	2	2
River Channels							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Glades and Barrens							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Canebrakes							
Abundance	R	R	R	R	R	R	R
Distribution	P	F	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	5	2	2
Baygalls and Bayheads							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	F	G	G	G	G
Likelihood of Limitation	M	M	H	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Coastal Plain Ponds and Swamps							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Mature Mesic Hardwood Forests							

Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	2	2	5	2	3	2	2
Mature Oak Forests							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	3	5	5	3	3	3	5
Mature Yellow Pine Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	G	F	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	2	5	3	3	2	2
Longleaf Pine Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	2	5	3	3	2	2
Early-Successional Forests							
Abundance	O	O	C	O	O	R	O
Distribution	G	G	G	F	G	F	G
Likelihood of Limitation	L	L	L	M	L	H	L
Management Effects	2	2	2	5	2	5	2
Mature Forest Interiors							
Abundance	O	O	O	O	O	O	O
Distribution	P	F	P	P	P	P	P
Likelihood of Limitation	H	M	H	H	H	H	H
Management Effects	2	2	5	2	3	2	2
Canopy Gaps							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	2	2	5	2	3	2	2
Woodlands, Savannas, and Grasslands							
Abundance	R	O	R	O	R	O	O
Distribution	P	G	P	F	P	F	F
Likelihood of Limitation	H	L	H	M	H	M	M
Management Effects	3	2	3	2	3	2	2
Mixed Landscapes							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Late Successional Riparian							
Abundance	C	C	C	C	C	C	C

Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Early-Successional Riparian							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	2	2	2
Snags							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Downed Wood							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Den Trees							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Hard Mast							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Remoteness							
Abundance	O	O	O	O	O	O	O
Distribution	P	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	3	3	3	3	3	3	3
Lakeshores							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	1	1	1
Water Quality							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	1	1	1	1	1	1	1

Appendix F, Table K-D. Summary of expected abundance, distribution, likelihood of limitation, and management effects for habitat elements by forest plan revision alternatives.

Forest Unit: Talladega Division of Talladega NF

	Alternative						
Habitat Elements	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Bogs, Fens, Seeps, Seasonal Ponds							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Open Wetlands							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
River Channels							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Glades and Barrens							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Basic Mesic Forests							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	F	G	G
Likelihood of Limitation	M	M	M	M	H	M	M
Management Effects	1	1	1	1	3	1	1
Rock Outcrops and Cliffs							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Spray Cliffs							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1

Canebrakes							
Abundance	R	R	R	R	R	R	R
Distribution	P	F	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	5	2	2
Caves and Mines							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	1	1	1
Mature Mesic Hardwood Forests							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	2	2	5	2	3	2	2
Mature Oak Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	2	5	2	3	2	3
Mature Yellow Pine Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	2	5	3	3	2	2
Mountain Longleaf Pine Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	P	F	F	F	F
Likelihood of Limitation	L	L	M	L	L	L	L
Management Effects	3	2	5	3	3	2	2
Early-Successional Forests							
Abundance	O	O	C	O	O	R	O
Distribution	G	G	G	F	G	F	G
Likelihood of Limitation	L	L	L	M	L	H	L
Management Effects	2	2	2	5	2	5	2
Mature Forest Interiors							
Abundance	O	O	O	O	O	O	O
Distribution	P	F	P	P	P	P	P
Likelihood of Limitation	H	M	H	H	H	H	H
Management Effects	2	2	5	2	3	2	2
Canopy Gaps							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	2	2	5	2	3	2	2
Woodlands, Savannas, and Grasslands							

Abundance	R	O	R	O	R	O	O
Distribution	P	G	P	F	P	F	F
Likelihood of Limitation	H	L	H	M	H	M	M
Management Effects	3	2	3	2	3	2	2
Cedar Woodlands							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Mixed Landscapes							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Late Successional Riparian							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Early-Successional Riparian							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	2	2	2
Snags							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Downed Wood							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Den Trees							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Hard Mast							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Remoteness							
Abundance	O	O	O	O	O	O	O

Distribution	P	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	3	3	3	3	3	3	3
Lakeshores							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	1	1	1
Water Quality							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	1	1	1	1	1	1	1

Appendix F, Table K-E. Summary of expected abundance, distribution, likelihood of limitation, and management effects for habitat elements by forest plan revision alternatives.

Forest Unit: Tuskegee

	Alternative						
Habitat Elements	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Bogs, Fens, Seeps, Seasonal Ponds							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Open Wetlands							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
River Channels							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Canebrakes							
Abundance	R	R	R	R	R	R	R
Distribution	P	F	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	5	2	2
Baygalls and Bayheads							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	F	G	G	G	G
Likelihood of Limitation	M	M	H	M	M	M	M
Management Effects	1	1	1	1	3	1	1
Coastal Plain Ponds and Swamps							
Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	1	1	1	1	3	1	1
Mature Mesic Hardwood Forests							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	2	2	5	2	3	2	2

Mature Oak Forests							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	3	5	5	3	3	3	5
Mature Yellow Pine Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	G	F	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	2	5	3	3	2	2
Longleaf Pine Forests							
Abundance	C	C	C	C	C	C	C
Distribution	F	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	2	5	3	3	2	2
Early-Successional Forests							
Abundance	O	O	C	O	O	R	O
Distribution	G	G	G	F	G	F	G
Likelihood of Limitation	L	L	L	M	L	H	L
Management Effects	2	2	2	5	2	5	2
Mature Forest Interiors							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	P	P	P	P	P
Likelihood of Limitation	M	M	H	H	H	H	H
Management Effects	2	2	5	2	3	2	2
Canopy Gaps							
Abundance	O	O	O	O	O	O	O
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	2	2	5	2	3	2	2
Woodlands, Savannas, and Grasslands							
Abundance	R	O	R	O	R	O	O
Distribution	P	G	P	F	P	F	F
Likelihood of Limitation	H	L	H	M	H	M	M
Management Effects	3	2	3	2	3	2	2
Mixed Landscapes							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Late Successional Riparian							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Early-Successional Riparian							

Abundance	R	R	R	R	R	R	R
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	2	2	2	2	2	2	2
Snags							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Downed Wood							
Abundance	C	C	C	C	C	C	C
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Den Trees							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2	2
Hard Mast							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3	3
Remoteness							
Abundance	O	O	O	O	O	O	O
Distribution	P	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H	H
Management Effects	3	3	3	3	3	3	3
Lakeshores							
Abundance	R	R	R	R	R	R	R
Distribution	G	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M	M
Management Effects	1	1	1	1	1	1	1
Water Quality							
Abundance	C	C	C	C	C	C	C
Distribution	F	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L	L
Management Effects	1	1	1	1	1	1	1

Table L: Key to Variables	Risk to Species Viability for Each Species/Habitat Relationship by Forest Plan Alternative

Status	The species' ranking for viability status
Code Description	
F	Federally-listed or Proposed as Endangered or Threatened
S	Regional Forester's Sensitive Species List
O	Locally rare or other.

Forest Rank FRank	(see text for definition of Forest Rank)
Code Description	
F?	Present on the forest, but abundance information is insufficient to develop rank.
F0	Not present, no known occurrences on the forest unit, and unit is outside the species range or habitat is not present.
F1	Extremely rare on the forest unit, generally with 1-5 occurrences.
F2	Very rare on the forest unit, generally with 6-20 occurrences.
F3	Rare and uncommon on the forest unit, from 21-100 occurrences.
F4	Widespread, abundant, and apparently secure on the forest unit.
F5	Demonstrably secure on the forest unit.
FP	Possibly could occur on the forest unit, but documented occurrences not known.
FH	Of documented historical occurrence on the forest unit; may be rediscovered.
FX	Once occurred but has been extirpated from the forest unit; it is not likely to be rediscovered.

Viability Risk	(see text for process used to define level of risk)
Code Description	
1	Very High
2	High
3	Moderately High
4	Moderate
5	Low

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Mammals											
Mustela frenata	Long-tailed weasel	O	F2	Downed Wood	4	4	4	4	4	4	4
Mustela frenata	Long-tailed weasel	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Mustela frenata	Long-tailed weasel	O	F2	Mixed Landscapes	4	4	4	4	4	4	4
Mustela frenata	Long-tailed weasel	O	F2	Early-Successional Forests	4	4	4	3	4	2	4
Myotis grisescens	Gray bat	F	F1	Caves and Mines	1	1	1	1	1	1	1
Myotis grisescens	Gray bat	F	F1	Late Successional Riparian	3	3	3	3	3	3	3
Myotis lucifugus	Little brown bat	O	F2	Caves and Mines	2	2	2	2	2	2	2
Myotis lucifugus	Little brown bat	O	F2	Den Trees	4	4	4	4	4	4	4
Myotis lucifugus	Little brown bat	O	F2	Open Wetlands	2	2	2	2	2	2	2
Myotis lucifugus	Little brown bat	O	F2	Snags	4	4	4	4	4	4	4
Myotis septentrionalis	Northern long-eared bat	O	F2	Caves and Mines	2	2	2	2	2	2	2
Myotis septentrionalis	Northern long-eared bat	O	F2	Snags	4	4	4	4	4	4	4
Myotis septentrionalis	Northern long-eared bat	O	F2	Den Trees	4	4	4	4	4	4	4
Myotis sodalis	Indiana bat	F	F1	Caves and Mines	1	1	1	1	1	1	1
Myotis sodalis	Indiana bat	F	F1	Den Trees	3	3	3	3	3	3	3
Myotis sodalis	Indiana bat	F	F1	Snags	3	3	3	3	3	3	3
Sylvilagus obscurus	Appalachian cottontail	O	F1	Early-Successional Forests	3	3	3	2	3	1	3
Tadarida brasiliensis	Brazilian free-tailed bat	O	F2	Snags	4	4	4	4	4	4	4
Tadarida brasiliensis	Brazilian free-tailed bat	O	F2	Den Trees	4	4	4	4	4	4	4
Tadarida brasiliensis	Brazilian free-tailed bat	O	F2	Mixed Landscapes	4	4	4	4	4	4	4
Ursus americanus americanus	American black bear	O	F2	Den Trees	4	4	4	4	4	4	4
Ursus americanus americanus	American black bear	O	F2	Snags	4	4	4	4	4	4	4
Ursus americanus americanus	American black bear	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Ursus americanus americanus	American black bear	O	F2	Mixed Landscapes	4	4	4	4	4	4	4
Birds											

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Accipiter cooperii	Cooper's hawk	O	F?	Mixed Landscapes	3	3	3	3	3	3	3
Accipiter striatus	Sharp-shinned hawk	O	F?	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Accipiter striatus	Sharp-shinned hawk	O	F?	Mature Hemlock Forests	1	1	1	1	1	1	1
Colinus virginianus	Northern bobwhite	O	F?	Mature Yellow Pine Forests	1	1	1	2	2	2	2
Colinus virginianus	Northern bobwhite	O	F?	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Dendroica cerulea	Cerulean warbler	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Dendroica cerulea	Cerulean warbler	O	F1	Canopy Gaps	3	3	2	3	3	3	3
Dendroica cerulea	Cerulean warbler	O	F1	Mature Forest Interiors	3	3	3	3	3	3	3
Dendroica cerulea	Cerulean warbler	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Dendroica discolor	Prairie warbler	O	F3	Early-Successional Forests	5	5	5	4	5	3	5
Dendroica discolor	Prairie warbler	O	F3	Open Wetlands	3	3	3	3	3	3	3
Dendroica dominica	Yellow-throated warbler	O	F?	Late Successional Riparian	3	3	3	3	3	3	3
Dendroica virens	Black-throated green warbler	O	F?	Mature Forest Interiors	3	3	3	3	3	3	3
Dendroica virens	Black-throated green warbler	O	F?	Canopy Gaps	3	3	2	3	3	3	3
Dendroica virens	Black-throated green warbler	O	F?	Mature Hemlock Forests	1	1	1	1	1	1	1
Dendroica virens	Black-throated green warbler	O	F?	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Helmitheros vermivorus	Worm-eating warbler	O	F3	Canopy Gaps	5	5	4	5	5	5	5
Helmitheros vermivorus	Worm-eating warbler	O	F3	Mature Forest Interiors	5	5	5	5	5	5	5
Hylocichla mustelina	Wood thrush	O	F3	Mature Forest Interiors	5	5	5	5	5	5	5
Hylocichla mustelina	Wood thrush	O	F3	Mature Mesic Hardwood Forests	5	5	5	5	5	5	5
Hylocichla mustelina	Wood thrush	O	F3	Canopy Gaps	5	5	4	5	5	5	5
Icterus spurius	Orchard oriole	O	F?	Mature Oak Forests	3	3	3	3	3	3	3

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Icterus spurius	Orchard oriole	O	F?	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Icterus spurius	Orchard oriole	O	F?	Mixed Landscapes	3	3	3	3	3	3	3
Passerculus sandwichensis	Savannah sparrow	O	F?	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Pooecetes gramineus	Vesper sparrow	O	F?	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Spizella pusilla	Field sparrow	O	F?	Early-Successional Forests	3	3	3	2	3	1	3
Spizella pusilla	Field sparrow	O	F?	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Vermivora pinus	Blue-winged warbler	O	F?	Early-Successional Forests	3	3	3	2	3	1	3
Vireo flavifrons	Yellow-throated vireo	O	F3	Mature Forest Interiors	5	5	5	5	5	5	5
Vireo flavifrons	Yellow-throated vireo	O	F3	Canopy Gaps	5	5	4	5	5	5	5
Vireo flavifrons	Yellow-throated vireo	O	F3	Mature Oak Forests	5	5	5	5	5	5	5
Wilsonia citrina	Hooded warbler	O	F?	Mature Forest Interiors	3	3	3	3	3	3	3
Wilsonia citrina	Hooded warbler	O	F?	Canopy Gaps	3	3	2	3	3	3	3
Wilsonia citrina	Hooded warbler	O	F?	Early-Successional Forests	3	3	3	2	3	1	3
Wilsonia citrina	Hooded warbler	O	F?	Mature Oak Forests	3	3	3	3	3	3	3
Reptiles											
Apalone spinifera spinifera	Eastern spiny softshell	O	F?	Open Wetlands	1	1	1	1	1	1	1
Apalone spinifera spinifera	Eastern spiny softshell	O	F?	Late Successional Riparian	3	3	3	3	3	3	3
Apalone spinifera spinifera	Eastern spiny softshell	O	F?	Water Quality	3	3	3	3	3	3	3
Cemophora coccinea copei	Northern scarlet snake	O	F?	Downed Wood	3	3	3	3	3	3	3
Cemophora coccinea copei	Northern scarlet snake	O	F?	Mature Yellow Pine Forests	1	1	1	2	2	2	2
Cemophora coccinea copei	Northern scarlet snake	O	F?	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

						Viability Risk by Alternative					
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Cemophora coccinea copei	Northern scarlet snake	O	F?	Mature Oak Forests	3	3	3	3	3	3	3
Crotalus horridus	Timber rattlesnake	O	F3	Downed Wood	5	5	5	5	5	5	5
Crotalus horridus	Timber rattlesnake	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4
Crotalus horridus	Timber rattlesnake	O	F3	Mature Yellow Pine Forests	3	3	3	4	4	4	4
Crotalus horridus	Timber rattlesnake	O	F3	Mature Oak Forests	5	5	5	5	5	5	5
Crotalus horridus	Timber rattlesnake	O	F3	Rock Outcrops and Cliffs	4	4	4	4	4	4	4
Eumeces anthracinus anthracinus	Northern coal skink	O	F?	Late Successional Riparian	3	3	3	3	3	3	3
Eumeces anthracinus anthracinus	Northern coal skink	O	F?	Downed Wood	3	3	3	3	3	3	3
Graptemys geographica	Map turtle	O	F3	Late Successional Riparian	5	5	5	5	5	5	5
Graptemys geographica	Map turtle	O	F3	Water Quality	5	5	5	5	5	5	5
Graptemys geographica	Map turtle	O	F3	River Channels	3	3	3	3	3	3	3
Lampropeltis triangulum elapsoides	Scarlet kingsnake	O	F?	Mature Yellow Pine Forests	1	1	1	2	2	2	2
Lampropeltis triangulum elapsoides	Scarlet kingsnake	O	F?	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Lampropeltis triangulum elapsoides	Scarlet kingsnake	O	F?	Downed Wood	3	3	3	3	3	3	3
Lampropeltis triangulum elapsoides	Scarlet kingsnake	O	F?	Snags	3	3	3	3	3	3	3
Sternotherus depressus	Flattened musk turtle	F	F1	Water Quality	3	3	3	3	3	3	3
Sternotherus depressus	Flattened musk turtle	F	F1	Late Successional Riparian	3	3	3	3	3	3	3
Sternotherus minor	Loggerhead musk turtle	O	F?	Water Quality	3	3	3	3	3	3	3

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Sternotherus minor	Loggerhead musk turtle	O	F?	Open Wetlands	1	1	1	1	1	1	1
Sternotherus minor	Loggerhead musk turtle	O	F?	Late Successional Riparian	3	3	3	3	3	3	3
Tantilla coronata	Southeastern crowned snake	O	F?	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Tantilla coronata	Southeastern crowned snake	O	F?	Glades and Barrens	2	2	2	2	2	2	2
Tantilla coronata	Southeastern crowned snake	O	F?	Mature Yellow Pine Forests	1	1	1	2	2	2	2
Virginia valeriae valeriae	Eastern earth snake	O	F?	Mixed Landscapes	3	3	3	3	3	3	3
Amphibians											
Aneides aeneus	Green salamander	O	F3	Mature Hemlock Forests	3	3	3	3	3	3	3
Aneides aeneus	Green salamander	O	F3	Mature Mesic Hardwood Forests	5	5	5	5	5	5	5
Aneides aeneus	Green salamander	O	F3	Caves and Mines	3	3	3	3	3	3	3
Aneides aeneus	Green salamander	O	F3	Rock Outcrops and Cliffs	4	4	4	4	4	4	4
Eurycea longicauda	Longtail salamander	O	F?	Bogs, Fens, Seeps, Ponds	1	1	1	1	1	1	1
Eurycea longicauda	Longtail salamander	O	F?	Downed Wood	3	3	3	3	3	3	3
Eurycea longicauda	Longtail salamander	O	F?	Late Successional Riparian	3	3	3	3	3	3	3
Invertebrates											
Helicodiscus fimbriatus	Fringed coil	O	F?	Downed Wood	3	3	3	3	3	3	3
Helicodiscus fimbriatus	Fringed coil	O	F?	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Helicodiscus fimbriatus	Fringed coil	O	F?	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Trimerotropis saxatilis	Rock-loving grasshopper	S	F?	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Trimerotropis saxatilis	Rock-loving grasshopper	S	F?	Glades and Barrens	2	2	2	2	2	2	2
Plants--Vascular											
Acer saccharum ssp. leucoderme	Chalk maple	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Acer saccharum ssp. leucoderme	Chalk maple	O	F2	Late Successional Riparian	4	4	4	4	4	4	4

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Aesculus parviflora	Small-flowered buckeye	S	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Agastache nepetoides	Yellow giant hyssop	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Allium canadense var mobilense	Meadow onion	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Aplectrum hyemale	Puttyroot	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Arabis laevigata	Smooth rock cress	O	F2	Glades and Barrens	3	3	3	3	3	3	3
Asplenium resiliens	Blackstem spleenwort	O	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3
Asplenium rhizophyllum	Walking-fern spleenwort	O	F3	Rock Outcrops and Cliffs	4	4	4	4	4	4	4
Asplenium ruta-muraria	Wall-rue	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Carex brysonii	Bryson's sedge	S	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Castanea dentata	American chestnut	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Castanea pumila var. pumila	Allegheny chinkapin	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Catalpa bignonioides	Southern catalpa	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Cheilanthes alabamensis	Alabama lip-fern	O	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3
Cimicifuga racemosa	Black cohosh	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Cimicifuga racemosa	Black cohosh	O	F2	Basic Mesic Forests	3	3	3	3	2	3	3
Corallorhiza odontorhiza	Autumn coral-root	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Corallorhiza odontorhiza	Autumn coral-root	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Cypripedium acaule	Pink Lady's Slipper	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Cypripedium acaule	Pink Lady's Slipper	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Cypripedium acaule	Pink Lady's Slipper	O	F1	Mature Yellow Pine Forests	1	1	1	2	2	2	2
Delphinium alabamicum	Alabama larkspur	S	F1	Glades and Barrens	2	2	2	2	2	2	2

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Dicentra cucullaria	Dutchman's breeches	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Dicentra cucullaria	Dutchman's breeches	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Diervilla rivularis	River bush honeysuckle	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Diervilla rivularis	River bush honeysuckle	S	F1	Bogs, Fens, Seeps, Ponds	1	1	1	1	1	1	1
Diervilla rivularis	River bush honeysuckle	S	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Drosera rotundifolia	Round-leaved sundew	O	F1	Bogs, Fens, Seeps, Ponds	1	1	1	1	1	1	1
Eryngium yuccifolium	Rattlesnake-master	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Eryngium yuccifolium	Rattlesnake-master	O	F2	Glades and Barrens	3	3	3	3	3	3	3
Frasera caroliniensis	Columbo	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Galearis spectabilis	Showy orchid	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Halesia carolina	Carolina silverbell	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Halesia carolina	Carolina silverbell	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Halesia carolina	Carolina silverbell	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Halesia carolina	Carolina silverbell	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Huperzia porophila	Southern fir clubmoss	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Hydrangea cinerea	Gray's hydrangea	O	F2	Early-Successional Riparian	2	2	2	2	2	2	2
Hydrangea cinerea	Gray's hydrangea	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Hydrastis canadensis	Goldenseal	O	F2	Basic Mesic Forests	3	3	3	3	2	3	3
Hydrastis canadensis	Goldenseal	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Hymenophyllum tayloriae	Gorge filmy fern	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Isoetes butleri	Glade quillwort	O	F1	Glades and Barrens	2	2	2	2	2	2	2

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Isotria verticillata	Large whorled pagonia	O	F1	Bogs, Fens, Seeps, Ponds	1	1	1	1	1	1	1
Jamesianthus alabamensis	Jamesianthus	S	F2	Late Successional Riparian	4	4	4	4	4	4	4
Juglans cinerea	Butternut	S	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Juglans cinerea	Butternut	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Juglans cinerea	Butternut	S	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Leavenworthia crassa	Gladecress	S	F1	Glades and Barrens	2	2	2	2	2	2	2
Lonicera flava	Yellow honeysuckle	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Lonicera flava	Yellow honeysuckle	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Magnolia macrophylla	Bigleaf magnolia	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Magnolia macrophylla	Bigleaf magnolia	O	F2	Mature Oak Forests	4	4	4	4	4	4	4
Mitreola angustifolia	Mountain bitter cress	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Monotropsis odorata	Sweet pinesap	S	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Monotropsis odorata	Sweet pinesap	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Monotropsis odorata	Sweet pinesap	S	F1	Mature Oak Forests	3	3	3	3	3	3	3
Ophioglossum engelmannii	Limestone adder's tongue	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Orobanche uniflora	Broom-rape	O	F1	Bogs, Fens, Seeps, Ponds	1	1	1	1	1	1	1
Pachysandra procumbens	Allegheny spurge	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Panax quinquefolius	Ginseng	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Panax quinquefolius	Ginseng	O	F2	Basic Mesic Forests	3	3	3	3	2	3	3
Pediomelum subacaule	Southern scurf-pea	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Pellaea atropurpurea	Purple-stem cliffbreak	O	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3

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Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Philadelphus inodorus	Mock orange	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Platanthera integrilabia	White fringeless orchid	S	F1	Bogs, Fens, Seeps, Ponds	1	1	1	1	1	1	1
Pyrularia pubera	Buffalo nut	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Pyrularia pubera	Buffalo nut	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Rhododendron alabamense	Alabama azalea	O	F3	Mature Mesic Hardwood Forests	5	5	5	5	5	5	5
Rhododendron alabamense	Alabama azalea	O	F3	Late Successional Riparian	5	5	5	5	5	5	5
Rhododendron arborescens	Smooth azalea	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Rhododendron arborescens	Smooth azalea	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Rhododendron arborescens	Smooth azalea	O	F2	River Channels	2	2	2	2	2	2	2
Sagittaria secundifolia	Kral's water-plantain	F	F1	River Channels	1	1	1	1	1	1	1
Sagittaria secundifolia	Kral's water-plantain	F	F1	Late Successional Riparian	3	3	3	3	3	3	3
Sedum nevii	Nevius' stonecrop	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Sideroxylon lanuginosum	Gum bumelia	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Silene rotundifolia	Round-leaved fire pink	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Silene rotundifolia	Round-leaved fire pink	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Spigelia marilandica	Pink root	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Stewartia malacodendron	Silky camelia	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Styrax grandifolius	Bigleaf snowbell	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Styrax grandifolius	Bigleaf snowbell	O	F2	Mature Oak Forests	4	4	4	4	4	4	4
Symplocos tinctoria	Horse sugar	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Symplocos tinctoria	Horse sugar	O	F2	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Talinum mengesii	Menge's flame-flower	S	F1	Glades and Barrens	2	2	2	2	2	2	2

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

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Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Thalictrum mirabile	Little mountain meadowrue	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Thelypteris pilosa var. alabamensis	Alabama streak-sorus fern	F	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Trichomanes boschianum	Bristle fern	O	F3	Rock Outcrops and Cliffs	4	4	4	4	4	4	4
Trichomanes imbricatum	Weft-fern	O	F1	Spray Cliffs	2	2	2	2	2	2	2
Trichomanes imbricatum	Weft-fern	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Trichomanes imbricatum	Weft-fern	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Trichomanes petersii	Dwarf filmy fern	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Trillium cuneatum	Little Sweet Betsy	O	F3	Late Successional Riparian	5	5	5	5	5	5	5
Trillium cuneatum	Little Sweet Betsy	O	F3	Basic Mesic Forests	4	4	4	4	3	4	4
Trillium cuneatum	Little Sweet Betsy	O	F3	Mature Mesic Hardwood Forests	5	5	5	5	5	5	5
Trillium flexipes	Bent white trillium	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Trillium recurvatum	Prairie trillium	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Trillium sessile	Toadshade	O	F2	Basic Mesic Forests	3	3	3	3	2	3	3
Trillium stamineum	Bent trillium	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Trillium viride	Green trillium	O	F?	Basic Mesic Forests	2	2	2	2	1	2	2
Ulmus americana	American elm	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Vernonia noveboracensis	New York ironweed	O	F2	Bogs, Fens, Seeps, Ponds	2	2	2	2	2	2	2
Viola egglestonii	Eggleston's violet	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Vittaria appalachiana	Appalachian shoestring fern	O	F1	Spray Cliffs	2	2	2	2	2	2	2
Vittaria appalachiana	Appalachian shoestring fern	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Vittaria appalachiana	Appalachian shoestring fern	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Woodwardia areolata	Netted chain fern	O	F2	Bogs, Fens, Seeps, Ponds	2	2	2	2	2	2	2

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Xanthorhiza simplicissima	Yellow-root	O	F3	Early-Successional Riparian	3	3	3	3	3	3	3
Xanthorhiza simplicissima	Yellow-root	O	F3	Mature Mesic Hardwood Forests	5	5	5	5	5	5	5
Xanthorhiza simplicissima	Yellow-root	O	F3	Bogs, Fens, Seeps, Ponds	3	3	3	3	3	3	3
Plants--Nonvascular											
Amphidium mougeoth	A moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Amphidium mougeoth	A moss	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Amphidium mougeoth	A moss	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Anacamptodon spachnoides	A moss	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Aneura maxima	Liverwort	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Aneura maxima	Liverwort	O	F1	Bogs, Fens, Seeps, Ponds	1	1	1	1	1	1	1
Aneura maxima	Liverwort	O	F1	Spray Cliffs	2	2	2	2	2	2	2
Asplenium trichomanes	Maidenhair spleenwort	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Asplenium trichomanes	Maidenhair spleenwort	O	F2	Mature Hemlock Forests	2	2	2	2	2	2	2
Asplenium trichomanes	Maidenhair spleenwort	O	F2	Spray Cliffs	3	3	3	3	3	3	3
Bryhnia novae-angliae	Moss	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Bryhnia novae-angliae	Moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Bryoxiphium norvegicum	Sword moss	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Bryoxiphium norvegicum	Sword moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Bryum bicolor	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Campylostelium saxicola	Moss	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Campylostelium saxicola	Moss	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Cheilolejeunea evansii	Liverwort	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Cyrto-hypnum pygmaeum	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Cyrto-hypnum pygmaeum	Moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Dichodontium pellucidum	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Dichodontium pellucidum	Moss	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Diphyscium cumberlandianum	Moss	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Diphyscium cumberlandianum	Moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Diphyscium cumberlandianum	Moss	O	F1	Spray Cliffs	2	2	2	2	2	2	2
Diphyscium foliosum	Moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Diphyscium foliosum	Moss	O	F1	Spray Cliffs	2	2	2	2	2	2	2
Diphyscium foliosum	Moss	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Eurhynchium riparioides	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Herpetineuron toccoae	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Herpetineuron toccoae	Moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Isopterygiopsis muelleriana	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Isopterygium distichaceum	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Isopterygium distichaceum	Moss	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Mnium punctatum	Moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Mnium punctatum	Moss	O	F1	Spray Cliffs	2	2	2	2	2	2	2
Mnium punctatum	Moss	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Nardia lescurii	Liverwort	S	F2	Spray Cliffs	3	3	3	3	3	3	3
Nardia lescurii	Liverwort	S	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3
Nardia lescurii	Liverwort	S	F2	Late Successional Riparian	4	4	4	4	4	4	4
Oxystegus tenuirostris	Moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Oxystegus tenuirostris	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Pellia appalachiana	Liverwort	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Pellia appalachiana	Liverwort	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Plagiochila echinata	Liverwort	S	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3
Plagiochila echinata	Liverwort	S	F2	Late Successional Riparian	4	4	4	4	4	4	4
Plagiochila ludoviciana	Liverwort	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Plagiochila ludoviciana	Liverwort	O	F1	Spray Cliffs	2	2	2	2	2	2	2
Pohlia wahlenbergh	Moss	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Pohlia wahlenbergh	Moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Pseudotaxiphyllum distichaceum	Moss	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Pseudotaxiphyllum distichaceum	Moss	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Pseudotaxiphyllum distichaceum	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Radula sullivantii	Liverwort	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Radula sullivantii	Liverwort	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Radula sullivantii	Liverwort	S	F1	Spray Cliffs	2	2	2	2	2	2	2
Riccardia jugata	Liverwort	S	F1	Downed Wood	3	3	3	3	3	3	3
Riccardia jugata	Liverwort	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Selaginella arenicola var riddellii	Riddle's spikemoss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Sematophyllum marylandicum	Moss	O	F1	Mature Hemlock Forests	1	1	1	1	1	1	1
Sematophyllum marylandicum	Moss	O	F1	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Sematophyllum marylandicum	Moss	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Taxiphyllum taxirameum	A moss	O	F1	Spray Cliffs	2	2	2	2	2	2	2
Taxiphyllum taxirameum	A moss	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2

Appendix F, Table L-A. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Bankhead National Forest.

						Viability Risk by Alternative					
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Taxiphyllum taxirameum	A moss	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Tetrodontium brownianum	Little Georgia moss	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Tetrodontium brownianum	Little Georgia moss	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Tetrodontium brownianum	Little Georgia moss	S	F1	Spray Cliffs	2	2	2	2	2	2	2
Trichostomum crispulum	Moss	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Trichostomum crispulum	Moss	O	F1	Glades and Barrens	2	2	2	2	2	2	2

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Mammals											
Geomys pinetis	Southeastern pocketgopher	O	F?	Sandhills	2	2	2	2	2	2	2
Geomys pinetis	Southeastern pocketgopher	O	F?	Longleaf Pine Forests	3	3	3	3	3	3	3
Geomys pinetis	Southeastern pocketgopher	O	F?	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Mustela frenata	Long-tailed weasel	O	F3	Coastal Plain Ponds and Swamps	3	3	3	3	3	3	3
Mustela frenata	Long-tailed weasel	O	F3	Early-Successional Forests	5	5	5	4	5	3	5
Mustela frenata	Long-tailed weasel	O	F3	Mixed Landscapes	5	5	5	5	5	5	5
Mustela frenata	Long-tailed weasel	O	F3	Downed Wood	5	5	5	5	5	5	5
Mustela frenata	Long-tailed weasel	O	F3	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Myotis austroriparius	Southeastern bat	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Myotis austroriparius	Southeastern bat	S	F1	Open Wetlands	2	2	2	2	2	2	2
Myotis austroriparius	Southeastern bat	S	F1	Lakeshores	2	2	2	2	2	2	2
Myotis austroriparius	Southeastern bat	S	F1	Den Trees	3	3	3	3	3	3	3
Myotis lucifugus	Little brown bat	O	F2	Open Wetlands	3	3	3	3	3	3	3
Myotis lucifugus	Little brown bat	O	F2	Den Trees	4	4	4	4	4	4	4
Myotis lucifugus	Little brown bat	O	F2	Snags	4	4	4	4	4	4	4
Sylvilagus palustris	Marsh rabbit	O	F3	Coastal Plain Ponds and Swamps	3	3	3	3	3	3	3
Sylvilagus palustris	Marsh rabbit	O	F3	Canebrakes	3	3	3	3	3	3	3
Tadarida brasiliensis	Brazilian free-tailed bat	O	F3	Mixed Landscapes	5	5	5	5	5	5	5
Tadarida brasiliensis	Brazilian free-tailed bat	O	F3	Snags	5	5	5	5	5	5	5
Tadarida brasiliensis	Brazilian free-tailed bat	O	F3	Den Trees	5	5	5	5	5	5	5
Birds											
Aimophila aestivalis	Bachman's sparrow	S	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Aimophila aestivalis	Bachman's sparrow	S	F2	Longleaf Pine Forests	4	4	4	4	4	4	4
Falco sparverius	American kestrel	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Falco sparverius	American kestrel	O	F2	Snags	4	4	4	4	4	4	4
Haliaeetus leucocephalus	Bald eagle	F	F1	Late Successional Riparian	3	3	3	3	3	3	3
Haliaeetus leucocephalus	Bald eagle	F	F1	Lakeshores	2	2	2	2	2	2	2
Lanius ludovicianus	Loggerhead shrike	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4
Picoides borealis	Red-cockaded woodpecker	F	F2	Mature Yellow Pine Forests	4	4	4	4	4	4	4
Picoides borealis	Red-cockaded woodpecker	F	F2	Longleaf Pine Forests	4	4	4	4	4	4	4
Sitta pusilla	Brown-headed nuthatch	O	F3	Longleaf Pine Forests	5	5	5	5	5	5	5
Sitta pusilla	Brown-headed nuthatch	O	F3	Mature Yellow Pine Forests	5	5	5	5	5	5	5
Sitta pusilla	Brown-headed nuthatch	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4
Reptiles											
Alligator mississippiensis	American alligator	F	F3	Open Wetlands	4	4	4	4	4	4	4
Alligator mississippiensis	American alligator	F	F3	Late Successional Riparian	5	5	5	5	5	5	5
Crotalus adamanteus	Eastern diamondback rattlesnake	O	F3	Longleaf Pine Forests	5	5	5	5	5	5	5
Crotalus adamanteus	Eastern diamondback rattlesnake	O	F3	Wet Savannas and Flatwoods	4	4	4	4	4	4	4
Crotalus adamanteus	Eastern diamondback rattlesnake	O	F3	Sandhills	4	4	4	4	4	4	4
Gopherus polyphemus	Gopher tortoise	S	F2	Longleaf Pine Forests	4	4	4	4	4	4	4
Gopherus polyphemus	Gopher tortoise	S	F2	Sandhills	3	3	3	3	3	3	3
Graptemys ernsti	Escambia map turtle	S	F3	Water Quality	5	5	5	5	5	5	5

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

						Viability Risk by Alternative					
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Graptemys ernsti	Escambia map turtle	S	F3	Late Successional Riparian	5	5	5	5	5	5	5
Graptemys ernsti	Escambia map turtle	S	F3	Downed Wood	5	5	5	5	5	5	5
Hyla andersonii	Pine barrens treefrog	O	F3	Wet Savannas and Flatwoods	4	4	4	4	4	4	4
Hyla andersonii	Pine barrens treefrog	O	F3	Baygalls and Bayheads	4	4	3	4	4	4	4
Hyla andersonii	Pine barrens treefrog	O	F3	Bogs, Fens, Seeps, Seasonal Ponds	3	3	3	3	3	3	3
Lampropeltis getulus getulus	Eastern kingsnake	O	F3	Coastal Plain Ponds and Swamps	3	3	3	3	3	3	3
Lampropeltis getulus getulus	Eastern kingsnake	O	F3	Early-Successional Riparian	3	3	3	3	3	3	3
Lampropeltis getulus getulus	Eastern kingsnake	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4
Lampropeltis getulus getulus	Eastern kingsnake	O	F3	Wet Savannas and Flatwoods	4	4	4	4	4	4	4
Micrurus fulvius	Eastern coral snake	O	F2	Longleaf Pine Forests	4	4	4	4	4	4	4
Micrurus fulvius	Eastern coral snake	O	F2	Wet Savannas and Flatwoods	3	3	3	3	3	3	3
Micrurus fulvius	Eastern coral snake	O	F2	Downed Wood	4	4	4	4	4	4	4
Micrurus fulvius	Eastern coral snake	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Pituophis melanoleucus mugitus	Florida pine snake	S	F3	Downed Wood	5	5	5	5	5	5	5
Pituophis melanoleucus mugitus	Florida pine snake	S	F3	Longleaf Pine Forests	5	5	5	5	5	5	5
Pituophis melanoleucus mugitus	Florida pine snake	S	F3	Remoteness	3	3	3	3	3	3	3
Seminatrix pygaea pygaea	North Florida swamp snake	O	F2	Coastal Plain Ponds and Swamps	2	2	2	2	2	2	2
Amphibians											

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Amphiuma pholeter	One-toed amphiuma	O	F?	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Amphiuma pholeter	One-toed amphiuma	O	F?	Open Wetlands	2	2	2	2	2	2	2
Rana capito sevosa	Dusky gopher frog	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Rana capito sevosa	Dusky gopher frog	S	F1	Sandhills	2	2	2	2	2	2	2
Rana heckscheri	River frog	O	F?	Baygalls and Bayheads	2	2	1	2	2	2	2
Rana heckscheri	River frog	O	F?	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Rana heckscheri	River frog	O	F?	River Channels	1	1	1	1	1	1	1
Plants--Vascular											
Agalinis aphylla	Leafless False-foxglove	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Agalinis aphylla	Leafless False-foxglove	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Agalinis aphylla	Leafless False-foxglove	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Agalinis divaricata	Pinelands false foxglove	S	F1	Longleaf Pine Forests	3	3	3	3	3	3	3
Agalinis georgiana	A false foxglove	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Agalinis georgiana	A false foxglove	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Agalinis georgiana	A false foxglove	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Agalinis linifolia	Flax-leaf foxglove	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Amphicarpum muehlenbergianum	Blue maiden-cane	O	F1	Canebrakes	1	1	1	1	1	1	1
Amphicarpum muehlenbergianum	Blue maiden-cane	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Amphicarpum muehlenbergianum	Blue maiden-cane	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Amphicarpum muehlenbergianum	Blue maiden-cane	O	F1	Open Wetlands	2	2	2	2	2	2	2

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Andropogon arctatus	Pinewoods bluestem	S	F1	Longleaf Pine Forests	3	3	3	3	3	3	3
Andropogon capillipes	Beardgrass	O	F1	Longleaf Pine Forests	3	3	3	3	3	3	3
Andropogon floridanus	Florida bluestem	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Andropogon floridanus	Florida bluestem	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Andropogon gyrans var stenophyllus	A bluestem	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Andropogon gyrans var stenophyllus	A bluestem	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Apteria aphylla	Nodding nixie	O	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Apteria aphylla	Nodding nixie	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Arnoglossum sulcatum	Indian plantain	S	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Asclepias rubra	Red milkweed	O	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Asclepias rubra	Red milkweed	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Aster eryngiifolius	Coyote-thistle aster	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Aster eryngiifolius	Coyote-thistle aster	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Burmannia capitata	Bluethreads	O	F2	Coastal Plain Ponds and Swamps	2	2	2	2	2	2	2
Burmannia capitata	Bluethreads	O	F2	Baygalls and Bayheads	3	3	2	3	3	3	3
Calopogon barbatus	Bearded grasspink	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Calopogon barbatus	Bearded grasspink	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Calopogon barbatus	Bearded grasspink	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Calopogon multiflorus	Many-flowered grasspink	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Calopogon pallidus	Pale grasspink	O	F3	Bogs, Fens, Seeps, Seasonal Ponds	3	3	3	3	3	3	3
Calopogon pallidus	Pale grasspink	O	F3	Wet Savannas and Flatwoods	4	4	4	4	4	4	4
Carex exilis	Coast sedge	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Carex turgescens	Swollen sedge	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Carex turgescens	Swollen sedge	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Carex turgescens	Swollen sedge	O	F1	Canebrakes	1	1	1	1	1	1	1
Carex turgescens	Swollen sedge	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Cleistes divaricata	Spreading pogonia	O	F2	Early-Successional Riparian	2	2	2	2	2	2	2
Cleistes divaricata	Spreading pogonia	O	F2	Coastal Plain Ponds and Swamps	2	2	2	2	2	2	2
Cleistes divaricata	Spreading pogonia	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Cleistes divaricata	Spreading pogonia	O	F2	Wet Savannas and Flatwoods	3	3	3	3	3	3	3
Coelorachis tuberculosa	Florida joint grass	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Coelorachis tuberculosa	Florida joint grass	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Coelorachis tuberculosa	Florida joint grass	S	F1	Open Wetlands	2	2	2	2	2	2	2
Dicerandra linearifolia	Large-flowered pennyroyal	O	F1	Sandhills	2	2	2	2	2	2	2
Drosera tracyi	Tracy's Dewthread	O	F2	Wet Savannas and Flatwoods	3	3	3	3	3	3	3
Drosera tracyi	Tracy's Dewthread	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Echinodorus parvulus	Dwarf burhead	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Echinodorus parvulus	Dwarf burhead	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Epidendrum conopseum	Greenfly orchid	O	F2	Wet Savannas and Flatwoods	3	3	3	3	3	3	3

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Epidendrum conopseum	Greenfly orchid	O	F2	Baygalls and Bayheads	3	3	2	3	3	3	3
Eriocaulon lineare	Narrow pipewort	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Eriocaulon lineare	Narrow pipewort	O	F1	Open Wetlands	2	2	2	2	2	2	2
Eriocaulon texense	Bogbutton	O	F1	Open Wetlands	2	2	2	2	2	2	2
Eriocaulon texense	Bogbutton	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Eupatorium leptophyllum	Limesink dog-fennel	O	F1	Early-Successional Forests	3	3	3	2	3	1	3
Helenium vernale	Spring sneezeweed	O	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Helenium vernale	Spring sneezeweed	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Helianthus heterophyllus	Wetland sunflower	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Hibiscus coccineus	Brilliant hibiscus	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Hypericum nitidum	Carolina St. John's wort	O	F?	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Hypericum nitidum	Carolina St. John's wort	O	F?	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Hypericum nitidum	Carolina St. John's wort	O	F?	Early-Successional Riparian	1	1	1	1	1	1	1
Lachnocaulon digynum	Bogbutton	S	F1	Open Wetlands	2	2	2	2	2	2	2
Lachnocaulon minus	Small's bogbutton	O	F1	Open Wetlands	2	2	2	2	2	2	2
Lilaeopsis carolinensis	Lilaeopsis	O	F1	Open Wetlands	2	2	2	2	2	2	2
Lilaeopsis carolinensis	Lilaeopsis	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Lilium iridollae	Panhandle lily	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Lilium iridollae	Panhandle lily	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Lindera subcoriacea	Bog spicebush	S	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Lindera subcoriacea	Bog spicebush	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

						Viability Risk by Alternative					
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Linum macrocarpum	Spring hill flax	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Lophiola aurea	Golden crest	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Lophiola aurea	Golden crest	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Ludwigia spathulata	Spatulate seedbox	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Ludwigia spathulata	Spatulate seedbox	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Macranthera flammea	Orange beard tongue	S	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Macranthera flammea	Orange beard tongue	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Myriophyllum laxum	Water milfoil	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Myriophyllum laxum	Water milfoil	S	F1	Open Wetlands	2	2	2	2	2	2	2
Myriophyllum laxum	Water milfoil	S	F1	Lakeshores	2	2	2	2	2	2	2
Panicum nudicaule	Naked-stemmed panicum	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Phoebanthus tenuifolius	Pineland false sunflower	O	F1	Longleaf Pine Forests	3	3	3	3	3	3	3
Phoebanthus tenuifolius	Pineland false sunflower	O	F1	Sandhills	2	2	2	2	2	2	2
Phoebanthus tenuifolius	Pineland false sunflower	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Phoebanthus tenuifolius	Pineland false sunflower	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Pieris phillyreifolia	Climbing heath	S	F2	Coastal Plain Ponds and Swamps	2	2	2	2	2	2	2
Pieris phillyreifolia	Climbing heath	S	F2	Wet Savannas and Flatwoods	3	3	3	3	3	3	3
Pinguicula planifolia	Chapman's butterwort	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Pinguicula primuliflora	Southern butterwort	S	F2	Baygalls and Bayheads	3	3	2	3	3	3	3
Pinguicula primuliflora	Southern butterwort	S	F2	Wet Savannas and Flatwoods	3	3	3	3	3	3	3

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Pinguicula pumila	Small butterwort	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Pinguicula pumila	Small butterwort	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Pinus serotina	Pond pine	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Pinus serotina	Pond pine	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Pityopsis oligantha	Golden aster	S	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Platanthera blephariglottis var conspicua	Large white-fringed orchid	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Platanthera blephariglottis var conspicua	Large white-fringed orchid	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Platanthera flava var flava	Southern rein orchid	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Platanthera flava var flava	Southern rein orchid	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Platanthera integra	Yellow fringeless orchid	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Pleea tenuifolia	Rush false-asphodel	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Pleea tenuifolia	Rush false-asphodel	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Polygala boykinii	White Milkwort	O	F?	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Polygala boykinii	White Milkwort	O	F?	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Polygala hookeri	Hooker milkwort	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Rhapidophyllum hystrix	Needlepalm	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Rhapidophyllum hystrix	Needlepalm	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Rhexia salicifolia	Panhandle meadowbeauty	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Rhexia salicifolia	Panhandle meadowbeauty	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Rhododendron austrinum	Florida flame azalea	S	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.											
						Viability Risk by Alternative					
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Rhynchospora crinipes	Hairy-penducled beakrush	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Rhynchospora crinipes	Hairy-penducled beakrush	S	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Rhynchospora macra	Southern white beakrush	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Rhynchospora oligantha	Few-flowered beakrush	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Rhynchospora oligantha	Few-flowered beakrush	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Rhynchospora pleiantha	Beakrush	S	F1	Open Wetlands	2	2	2	2	2	2	2
Rhynchospora pleiantha	Beakrush	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Rhynchospora scirpoides	Long-beaked baldrush	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Rhynchospora stenophylla	Beakrush	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Rhynchospora stenophylla	Beakrush	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Rhynchospora thornei	Thorne's beaksedge	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Rhynchospora thornei	Thorne's beaksedge	S	F1	Open Wetlands	2	2	2	2	2	2	2
Rhynchospora torreyana	Torrey beakrush	O	F1	Canebrakes	1	1	1	1	1	1	1
Rhynchospora torreyana	Torrey beakrush	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Rhynchospora torreyana	Torrey beakrush	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Rhynchospora torreyana	Torrey beakrush	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Ruellia noctiflora	Night-flowering ruellia	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Ruellia noctiflora	Night-flowering ruellia	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Ruellia noctiflora	Night-flowering ruellia	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Sagittaria isoetiformis	Slender arrowhead	O	F2	Open Wetlands	3	3	3	3	3	3	3

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Sagittaria isoetiformis	Slender arrowhead	O	F2	Coastal Plain Ponds and Swamps	2	2	2	2	2	2	2
Sarracenia leucophylla	White-top pitcher plant	S	F3	Bogs, Fens, Seeps, Seasonal Ponds	3	3	3	3	3	3	3
Sarracenia psittacina	Parrot pitcherplant	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Sarracenia purpurea var burkii	Rosea pitcherplant	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Sarracenia rubra	Sweet pitcherplant	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Sarracenia rubra ssp. wherryi	Wherry's pitcher plant	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Schizachyrium stoloniferum	A bluestem	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Schizachyrium stoloniferum	A bluestem	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Sporobolus curtissii	Pineland dropseed	O	F1	Longleaf Pine Forests	3	3	3	3	3	3	3
Sporobolus curtissii	Pineland dropseed	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Stylisma aquatica	Water dawnflower	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Tridens carolinianus	Sandgrass	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Tridens carolinianus	Sandgrass	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Utricularia biflora	Two-flowered bladderwort	O	F1	Open Wetlands	2	2	2	2	2	2	2
Utricularia floridana	Florida bladderwort	O	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Utricularia floridana	Florida bladderwort	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Utricularia floridana	Florida bladderwort	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Utricularia purpurea	Purple bladderwort	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Utricularia purpurea	Purple bladderwort	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1

Appendix F, Table L-B. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Conecuh National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Utricularia resupinata	Northeastern bladderwort	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Utricularia resupinata	Northeastern bladderwort	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Verbesina aristata	Coastal-plain crownbeard	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Websteria confervoides	Websteria	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Websteria confervoides	Websteria	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Xyris chapmanii	Chapman's yellow-eyed grass	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Xyris chapmanii	Chapman's yellow-eyed grass	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Xyris drummondii	Drummond's yellow-eyed grass	S	F2	Coastal Plain Ponds and Swamps	2	2	2	2	2	2	2
Xyris drummondii	Drummond's yellow-eyed grass	S	F2	Wet Savannas and Flatwoods	3	3	3	3	3	3	3
Xyris isoetifolia	Yellow-eyed grass	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Xyris isoetifolia	Yellow-eyed grass	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Xyris longisepala	Kral's yellow-eyed grass	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Xyris longisepala	Kral's yellow-eyed grass	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Xyris louisianica	Louisiana yellow-eyed grass	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Xyris louisianica	Louisiana yellow-eyed grass	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Xyris scabrifolia	Yellow-eyed grass	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Xyris scabrifolia	Yellow-eyed grass	S	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2
Xyris stricta	Pineland yellow-eyed grass	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Xyris stricta	Pineland yellow-eyed grass	O	F1	Wet Savannas and Flatwoods	2	2	2	2	2	2	2

Appendix F, Table L-C. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Oakmulgee Division of the Talladega National Forest.

						Viability Risk by Alternative					
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Mammals											
Geomys pinetis	Southeastern pocketgopher	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Geomys pinetis	Southeastern pocketgopher	O	F1	Longleaf Pine Forests	3	3	3	3	3	3	3
Mustela frenata	Long-tailed weasel	O	F3	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Mustela frenata	Long-tailed weasel	O	F3	Downed Wood	5	5	5	5	5	5	5
Mustela frenata	Long-tailed weasel	O	F3	Mixed Landscapes	5	5	5	5	5	5	5
Mustela frenata	Long-tailed weasel	O	F3	Early-Successional Forests	5	5	5	4	5	3	5
Mustela frenata	Long-tailed weasel	O	F3	Coastal Plain Ponds and Swamps	3	3	3	3	3	3	3
Myotis lucifugus	Little brown bat	O	F2	Den Trees	4	4	4	4	4	4	4
Myotis lucifugus	Little brown bat	O	F2	Open Wetlands	3	3	2	3	2	3	3
Myotis lucifugus	Little brown bat	O	F2	Snags	4	4	4	4	4	4	4
Tadarida brasiliensis	Brazilian free-tailed bat	O	F3	Mixed Landscapes	5	5	5	5	5	5	5
Tadarida brasiliensis	Brazilian free-tailed bat	O	F3	Den Trees	5	5	5	5	5	5	5
Tadarida brasiliensis	Brazilian free-tailed bat	O	F3	Snags	5	5	5	5	5	5	5
Birds											
Falco sparverius	American kestrel	O	F2	Snags	4	4	4	4	4	4	4
Falco sparverius	American kestrel	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Lanius ludovicianus	Loggerhead shrike	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4
Mycteria americana	Wood stork	F	F2	Open Wetlands	3	3	2	3	2	3	3
Picoides borealis	Red-cockaded woodpecker	F	F2	Mature Yellow Pine Forests	4	4	4	4	4	4	4
Picoides borealis	Red-cockaded woodpecker	F	F2	Longleaf Pine Forests	4	4	4	4	4	4	4
Sitta pusilla	Brown-headed nuthatch	O	F3	Longleaf Pine Forests	5	5	5	5	5	5	5
Sitta pusilla	Brown-headed nuthatch	O	F3	Mature Yellow Pine Forests	5	5	5	5	5	5	5

Appendix F, Table L-C. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Oakmulgee Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Sitta pusilla	Brown-headed nuthatch	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4
Reptiles											
Farancia erytrogramma	Rainbow snake	O	F1	River Channels	1	1	1	1	1	1	1
Farancia erytrogramma	Rainbow snake	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Lampropeltis getulus holbrooki	Speckled kingsnake	O	F2	Early-Successional Riparian	2	2	2	2	2	2	2
Plants--Vascular											
Aesculus parviflora	Small-flowered buckeye	S	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Amianthium muscaetoxicum	Fly poison	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Amianthium muscaetoxicum	Fly poison	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Apteria aphylla	Nodding nixie	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Apteria aphylla	Nodding nixie	O	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Arabis georgiana	Georgia rockcress	S	F1	Glades and Barrens	2	2	2	2	2	2	2
Asclepias rubra	Red milkweed	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Asclepias rubra	Red milkweed	O	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Baptisia megacarpa	Appalachicola wild indigo	S	F1	Open Wetlands	2	2	1	2	1	2	2
Baptisia megacarpa	Appalachicola wild indigo	S	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Carex decomposita	Cypress-knee sedge	S	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Carex impressinervia	Impressed nerve sedge	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Cypripedium kentuckiense	Southern lady's slipper	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Cypripedium pubescens	Yellow lady's slipper	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2

Appendix F, Table L-C. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Oakmulgee Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Halesia carolina	Carolina silverbell	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Halesia carolina	Carolina silverbell	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Hexastylis speciosa	Harper's heartleaf	S	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Hymenocallis caroliniana	Carolina spider lily	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Hymenocallis caroliniana	Carolina spider lily	O	F1	Open Wetlands	2	2	1	2	1	2	2
Jamesianthus alabamensis	Jamesianthus	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Magnolia pyramidata	Pyramid magnolia	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Oxalis grandis	Large-flowered wood sorrel	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Phoebanthus tenuifolius	Pineland false sunflower	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Phoebanthus tenuifolius	Pineland false sunflower	O	F1	Longleaf Pine Forests	3	3	3	3	3	3	3
Quercus arkansana	Arkansas oak	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Rhapidophyllum hystrix	Needlepalm	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Rhododendron alabamense	Alabama azalea	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Rhododendron alabamense	Alabama azalea	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Rhynchospora thornei	Thorne's beaksedge	S	F1	Open Wetlands	2	2	1	2	1	2	2
Rudbeckia auriculata	Eared coneflower	S	F1	River Channels	1	1	1	1	1	1	1
Rudbeckia mollis	Soft-haired coneflower	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Stewartia malacodendron	Silky camelia	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Tiarella cordifolia	Heart leaf foamflower	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Trillium lancifolium	Narrow-leaved trillium	S	F1	Late Successional Riparian	3	3	3	3	3	3	3

Appendix F, Table L-C. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Oakmulgee Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Xanthorhiza simplicissima	Yellow-root	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Xanthorhiza simplicissima	Yellow-root	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Xanthorhiza simplicissima	Yellow-root	O	F2	Early-Successional Riparian	2	2	2	2	2	2	2
Plants--Nonvascular											
Diphasiastrum digitatum	Fan clubmoss	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Diphasiastrum digitatum	Fan clubmoss	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Mammals											
Spilogale putorius	Spotted skunk	O	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3
Spilogale putorius	Spotted skunk	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Sylvilagus obscurus	Appalachian cottontail	O	F2	Early-Successional Forests	4	4	4	3	4	2	4
Birds											
Accipiter cooperii	Cooper's hawk	O	F3	Mixed Landscapes	5	5	5	5	5	5	5
Accipiter striatus	Sharp-shinned hawk	O	F3	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Aimophila aestivalis	Bachman's sparrow	S	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Caprimulgus carolinensis	Chuck-wills-widow	O	F1	Mixed Landscapes	3	3	3	3	3	3	3
Caprimulgus carolinensis	Chuck-wills-widow	O	F1	Mature Yellow Pine Forests	3	3	3	3	3	3	3
Caprimulgus vociferus	Whip-poor-will	O	F2	Mixed Landscapes	4	4	4	4	4	4	4
Caprimulgus vociferus	Whip-poor-will	O	F2	Canopy Gaps	3	3	3	3	3	3	3
Certhia americana	Brown creeper	O	F3	Snags	5	5	5	5	5	5	5
Coccyzus erythropthalmus	Black-billed cuckoo	O	F2	Canopy Gaps	3	3	3	3	3	3	3
Coccyzus erythropthalmus	Black-billed cuckoo	O	F2	Mature Forest Interiors	2	3	2	2	2	2	2
Colinus virginianus	Northern bobwhite	O	F2	Mature Yellow Pine Forests	4	4	4	4	4	4	4
Colinus virginianus	Northern bobwhite	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Dendroica discolor	Prairie warbler	O	F3	Early-Successional Forests	5	5	5	4	5	3	5
Dendroica discolor	Prairie warbler	O	F3	Open Wetlands	3	3	3	3	3	3	3
Dendroica dominica	Yellow-throated warbler	O	F3	Late Successional Riparian	5	5	5	5	5	5	5
Dendroica virens	Black-throated green warbler	O	F3	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Dendroica virens	Black-throated green warbler	O	F3	Mature Forest Interiors	3	4	3	3	3	3	3
Dendroica virens	Black-throated green warbler	O	F3	Canopy Gaps	4	4	4	4	4	4	4

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Falco peregrinus anatum	Peregrine falcon	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Falco peregrinus anatum	Peregrine falcon	S	F1	Remoteness	1	1	1	1	1	1	1
Haliaeetus leucocephalus	Bald eagle	F	F1	Late Successional Riparian	3	3	3	3	3	3	3
Haliaeetus leucocephalus	Bald eagle	F	F1	Lakeshores	2	2	2	2	2	2	2
Helmitheros vermivorus	Worm-eating warbler	O	F2	Mature Forest Interiors	2	3	2	2	2	2	2
Helmitheros vermivorus	Worm-eating warbler	O	F2	Canopy Gaps	3	3	3	3	3	3	3
Icterus spurius	Orchard oriole	O	F2	Mature Oak Forests	4	4	4	4	4	4	4
Icterus spurius	Orchard oriole	O	F2	Mixed Landscapes	4	4	4	4	4	4	4
Icterus spurius	Orchard oriole	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Pandion haliaetus	Osprey	O	F1	Lakeshores	2	2	2	2	2	2	2
Pandion haliaetus	Osprey	O	F1	Snags	3	3	3	3	3	3	3
Pandion haliaetus	Osprey	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Picoides borealis	Red-cockaded woodpecker	F	F1	Mature Yellow Pine Forests	3	3	3	3	3	3	3
Picoides borealis	Red-cockaded woodpecker	F	F1	Mountain Longleaf Pine Forests	3	3	2	3	3	3	3
Scolopax minor	American woodcock	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Scolopax minor	American woodcock	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Sitta pusilla	Brown-headed nuthatch	O	F1	Mature Yellow Pine Forests	3	3	3	3	3	3	3
Sitta pusilla	Brown-headed nuthatch	O	F1	Mountain Longleaf Pine Forests	3	3	2	3	3	3	3
Sitta pusilla	Brown-headed nuthatch	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Spizella pusilla	Field sparrow	O	F3	Early-Successional Forests	5	5	5	4	5	3	5
Spizella pusilla	Field sparrow	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Vireo flavifrons	Yellow-throated vireo	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Vireo flavifrons	Yellow-throated vireo	O	F1	Mature Forest Interiors	1	2	1	1	1	1	1
Vireo flavifrons	Yellow-throated vireo	O	F1	Canopy Gaps	2	2	2	2	2	2	2
Wilsonia citrina	Hooded warbler	O	F1	Canopy Gaps	2	2	2	2	2	2	2
Wilsonia citrina	Hooded warbler	O	F1	Early-Successional Forests	3	3	3	2	3	1	3
Wilsonia citrina	Hooded warbler	O	F1	Mature Forest Interiors	1	2	1	1	1	1	1
Wilsonia citrina	Hooded warbler	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Reptiles											
Apalone spinifera spinifera	Eastern spiny softshell	O	F3	Late Successional Riparian	5	5	5	5	5	5	5
Apalone spinifera spinifera	Eastern spiny softshell	O	F3	Water Quality	5	5	5	5	5	5	5
Apalone spinifera spinifera	Eastern spiny softshell	O	F3	Open Wetlands	3	3	3	3	3	3	3
Crotalus horridus	Timber rattlesnake	O	F3	Rock Outcrops and Cliffs	4	4	4	4	4	4	4
Crotalus horridus	Timber rattlesnake	O	F3	Mature Oak Forests	5	5	5	5	5	5	5
Crotalus horridus	Timber rattlesnake	O	F3	Downed Wood	5	5	5	5	5	5	5
Crotalus horridus	Timber rattlesnake	O	F3	Mature Yellow Pine Forests	5	5	5	5	5	5	5
Crotalus horridus	Timber rattlesnake	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4
Lampropeltis triangulum elapsoides	Scarlet kingsnake	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4
Lampropeltis triangulum elapsoides	Scarlet kingsnake	O	F3	Snags	5	5	5	5	5	5	5
Lampropeltis triangulum elapsoides	Scarlet kingsnake	O	F3	Downed Wood	5	5	5	5	5	5	5
Lampropeltis triangulum elapsoides	Scarlet kingsnake	O	F3	Mature Yellow Pine Forests	5	5	5	5	5	5	5

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Ophisaurus attenuatus longicaudus	Eastern slender glass lizard	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Ophisaurus attenuatus longicaudus	Eastern slender glass lizard	O	F1	Mixed Landscapes	3	3	3	3	3	3	3
Ophisaurus attenuatus longicaudus	Eastern slender glass lizard	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Pituophis melanoleucus melanoleucus	Northern pine snake	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Pituophis melanoleucus melanoleucus	Northern pine snake	O	F1	Downed Wood	3	3	3	3	3	3	3
Pituophis melanoleucus melanoleucus	Northern pine snake	O	F1	Mature Yellow Pine Forests	3	3	3	3	3	3	3
Sternotherus minor	Loggerhead musk turtle	O	F3	Open Wetlands	3	3	3	3	3	3	3
Sternotherus minor	Loggerhead musk turtle	O	F3	Late Successional Riparian	5	5	5	5	5	5	5
Sternotherus minor	Loggerhead musk turtle	O	F3	Water Quality	5	5	5	5	5	5	5
Tantilla coronata	Southeastern crowned snake	O	F2	Glades and Barrens	3	3	3	3	3	3	3
Tantilla coronata	Southeastern crowned snake	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Tantilla coronata	Southeastern crowned snake	O	F2	Mature Yellow Pine Forests	4	4	4	4	4	4	4
Thamnophis sauritus sauritus	Eastern ribbon snake	O	F2	Early-Successional Riparian	2	2	2	2	2	2	2
Thamnophis sauritus sauritus	Eastern ribbon snake	O	F2	Downed Wood	4	4	4	4	4	4	4
Thamnophis sauritus sauritus	Eastern ribbon snake	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Thamnophis sauritus sauritus	Eastern ribbon snake	O	F2	Open Wetlands	2	2	2	2	2	2	2
Virginia valeriae valeriae	Eastern earth snake	O	F2	Mixed Landscapes	4	4	4	4	4	4	4
Amphibians											
Aneides aeneus	Green salamander	O	F1	Caves and Mines	2	2	2	2	2	2	2
Aneides aeneus	Green salamander	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Aneides aeneus	Green salamander	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Desmognathus aeneus	Seepage salamander	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Desmognathus aeneus	Seepage salamander	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Desmognathus aeneus	Seepage salamander	O	F1	Downed Wood	3	3	3	3	3	3	3
Pseudacris brachyphona	Mountain chorus frog	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Pseudacris brachyphona	Mountain chorus frog	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Pseudacris brachyphona	Mountain chorus frog	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Pseudotriton montanus	Eastern mud salamander	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Pseudotriton montanus	Eastern mud salamander	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Pseudotriton montanus	Eastern mud salamander	O	F1	Open Wetlands	1	1	1	1	1	1	1
Pseudotriton montanus	Eastern mud salamander	O	F1	Downed Wood	3	3	3	3	3	3	3
Invertebrates											
Autochton cellus	Golden-banded skipper	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Celastrina ebenina	Dusky azure	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Celastrina ebenina	Dusky azure	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Speyeria diana	Diana fritillary	S	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Speyeria diana	Diana fritillary	S	F1	Canopy Gaps	2	2	2	2	2	2	2
Plants--Vascular											
Acer saccharum ssp. leucoderme	Chalk maple	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Acer saccharum ssp. leucoderme	Chalk maple	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Aesculus parviflora	Small-flowered buckeye	S	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Amorpha schwerini	Indigo bush	O	F1	River Channels	1	1	1	1	1	1	1
Amorpha schwerini	Indigo bush	O	F1	Glades and Barrens	2	2	2	2	2	2	2

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Amorpha schwerini	Indigo bush	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Aplectrum hyemale	Puttyroot	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Aquilegia canadensis var australis	Southern colombine	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Aquilegia canadensis var australis	Southern colombine	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Aralia racemosa	American spikenard	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Asplenium bradleyi	Bradley's spleenwort	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Asplenium resiliens	Blackstem spleenwort	O	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3
Asplenium rhizophyllum	Walking-fern spleenwort	O	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3
Aster georgianus	Georgia aster	S	F1	Glades and Barrens	2	2	2	2	2	2	2
Aster georgianus	Georgia aster	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Aster laevis var. concinnus	Smooth purple aster	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Aster laevis var. concinnus	Smooth purple aster	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Aster surculosus	Creeping aster	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Aster surculosus	Creeping aster	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Baptisia cinerea	Hairy wild indigo	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Baptisia cinerea	Hairy wild indigo	O	F2	Mountain Longleaf Pine Forests	4	4	3	4	4	4	4
Botrychium jenmanii	Alabama grape fern	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Botrychium jenmanii	Alabama grape fern	S	F1	Mixed Landscapes	3	3	3	3	3	3	3

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Botrychium jenmanii	Alabama grape fern	S	F1	Canopy Gaps	2	2	2	2	2	2	2
Botrychium jenmanii	Alabama grape fern	S	F1	Mature Oak Forests	3	3	3	3	3	3	3
Boykinia aconitifolia	Brook saxifrage	O	F1	River Channels	1	1	1	1	1	1	1
Boykinia aconitifolia	Brook saxifrage	O	F1	Spray Cliffs	2	2	2	2	2	2	2
Buchnera americana	American bluehearts	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Buchnera americana	American bluehearts	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Buchnera americana	American bluehearts	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Calystegia catesbeiana	Catesby's bindweed	O	F1	Mountain Longleaf Pine Forests	3	3	2	3	3	3	3
Camassia scilloides	Wild hyacinth	O	F1	Canopy Gaps	2	2	2	2	2	2	2
Campanulastrum americanum	Tall bellflower	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Campanulastrum americanum	Tall bellflower	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Carex abscondita	Thicket Sedge	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Carex abscondita	Thicket Sedge	O	F2	Basic Mesic Forests	3	3	3	3	2	3	3
Carex abscondita	Thicket Sedge	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Carex cherokeensis	Cherokee sedge	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Carex prasina	Drooping sedge	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Carex prasina	Drooping sedge	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Carex stricta	Tussock caric sedge	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Carex willdenowii var megarrhyncha	A sedge	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Castanea dentata	American chestnut	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Castanea pumila var. pumila	Allegheny chinkapin	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Catalpa bignonioides	Southern catalpa	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Cimicifuga racemosa	Black cohosh	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Cimicifuga racemosa	Black cohosh	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Cirsium altissimum	Tall thistle	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Cirsium altissimum	Tall thistle	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Clethra acuminata	Mountain sweet pepperbush	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Collinsonia verticillata	Whorled horsebalm	S	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Collinsonia verticillata	Whorled horsebalm	S	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Corallorhiza odontorhiza	Autumn coral-root	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Corallorhiza odontorhiza	Autumn coral-root	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Coreopsis verticillata	Whorled tickseed	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Coreopsis verticillata	Whorled tickseed	O	F1	Early-Successional Forests	3	3	3	2	3	1	3
Cornus sericea	Red-osier dogwood	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Cornus sericea	Red-osier dogwood	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Cunila origanoides	Common dittany	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Cunila origanoides	Common dittany	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Cypripedium acaule	Pink Lady's Slipper	O	F2	Mature Yellow Pine Forests	4	4	4	4	4	4	4
Cypripedium acaule	Pink Lady's Slipper	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Cypripedium acaule	Pink Lady's Slipper	O	F2	Basic Mesic Forests	3	3	3	3	2	3	3

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Desmodium tenuifolium	Slim-leaf tick-trefoil	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Desmodium tenuifolium	Slim-leaf tick-trefoil	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Desmodium tenuifolium	Slim-leaf tick-trefoil	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Dichanthelium linearifolium	Slim-leaf Witchgrass	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Dichanthelium linearifolium	Slim-leaf Witchgrass	O	F1	Mountain Longleaf Pine Forests	3	3	2	3	3	3	3
Dirca palustris	Leatherwood	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Dirca palustris	Leatherwood	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Dirca palustris	Leatherwood	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Eleocharis baldwinii	Baldwin's Spikerush	O	F1	Open Wetlands	1	1	1	1	1	1	1
Eryngium yuccifolium	Rattlesnake-master	O	F2	Glades and Barrens	3	3	3	3	3	3	3
Eryngium yuccifolium	Rattlesnake-master	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Euonymus atropurpureus	Wahoo	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Euonymus atropurpureus	Wahoo	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Euonymus atropurpureus	Wahoo	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Fimbristylis littoralis	Grass-like fimbry	O	F1	Open Wetlands	1	1	1	1	1	1	1
Fothergilla major	Witch alder	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Fothergilla major	Witch alder	S	F1	Mature Oak Forests	3	3	3	3	3	3	3
Fothergilla major	Witch alder	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Gentiana villosa	Striped gentian	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Halesia carolina	Carolina silverbell	O	F2	Basic Mesic Forests	3	3	3	3	2	3	3

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Halesia carolina	Carolina silverbell	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Halesia carolina	Carolina silverbell	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Helianthus longifolius	Longleaf sunflower	S	F1	Glades and Barrens	2	2	2	2	2	2	2
Helianthus smithii	Smith sunflower	S	F1	Mountain Longleaf Pine Forests	3	3	2	3	3	3	3
Heuchera longiflora	Long-flowered alumroot	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Heuchera parviflora	Little-leaved alumroot	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Hexalectris spicata	Crested coral root	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Hexastylis shuttleworthii var. harperi	Harper's wild ginger	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Hexastylis shuttleworthii var. harperi	Harper's wild ginger	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Hexastylis shuttleworthii var. shuttleworthii	Large-flowered heartleaf	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Hexastylis shuttleworthii var. shuttleworthii	Large-flowered heartleaf	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Huperzia porophila	Southern fir clubmoss	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Hydrangea cinerea	Gray's hydrangea	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Hydrangea cinerea	Gray's hydrangea	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Hypericum crux-andreae	St. Peter's-wort	O	F1	Open Wetlands	1	1	1	1	1	1	1
Hypericum crux-andreae	St. Peter's-wort	O	F1	Mature Yellow Pine Forests	3	3	3	3	3	3	3
Ilex longipes	Georgia holly	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Ilex longipes	Georgia holly	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Isotria verticillata	Large whorled pagonia	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Jamesianthus alabamensis	Jamesianthus	S	F2	Late Successional Riparian	4	4	4	4	4	4	4

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Juglans cinerea	Butternut	S	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Juglans cinerea	Butternut	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Juglans cinerea	Butternut	S	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Lathyrus venosus	Smooth veiny peavine	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Lathyrus venosus	Smooth veiny peavine	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Liatris aspera	Rough blazing star	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Liatris aspera	Rough blazing star	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Liatris microcephala	Small-head blazing star	O	F2	Glades and Barrens	3	3	3	3	3	3	3
Liatris microcephala	Small-head blazing star	O	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3
Liatris microcephala	Small-head blazing star	O	F2	River Channels	2	2	2	2	2	2	2
Ligustrum canadense	Lovage	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Ligustrum canadense	Lovage	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Lilium superbum	Turk's Cap Lily	O	F1	Canopy Gaps	2	2	2	2	2	2	2
Lilium superbum	Turk's Cap Lily	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Lilium superbum	Turk's Cap Lily	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Lobelia amoena	Southern lobelia	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Lobelia amoena	Southern lobelia	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Lobelia siphilitica	Great blue lobelia	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Lobelia siphilitica	Great blue lobelia	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Lonicera flava	Yellow honeysuckle	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Lonicera flava	Yellow honeysuckle	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Lysimachia fraseri	Fraser's loosestrife	S	F1	Canopy Gaps	2	2	2	2	2	2	2

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Lysimachia fraseri	Fraser's loosestrife	S	F1	River Channels	1	1	1	1	1	1	1
Lysimachia fraseri	Fraser's loosestrife	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Lysimachia fraseri	Fraser's loosestrife	S	F1	Mature Oak Forests	3	3	3	3	3	3	3
Lysimachia tonsa	Southern loosestrife	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Lysimachia tonsa	Southern loosestrife	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Magnolia macrophylla	Bigleaf magnolia	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Magnolia macrophylla	Bigleaf magnolia	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Magnolia virginiana	Sweetbay magnolia	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Marshallia trinervia	Broadleaf Barbara's buttons	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Matelea carolinensis	Carolina anglepod	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Melanthium latifolium	Broadleaf bunchflower	O	F1	Canopy Gaps	2	2	2	2	2	2	2
Melanthium latifolium	Broadleaf bunchflower	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Melanthium parviflorum	Small-flowered false hellebore	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Melanthium woodii	Wood false hellebore	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Nestronia umbellula	Nestronia	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Nestronia umbellula	Nestronia	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Oenothera linifolia	Thread-leaf sundrops	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Onosmodium virginianum	Virginia false gromwell	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Orontium aquaticum	Golden club	O	F1	River Channels	1	1	1	1	1	1	1
Orontium aquaticum	Golden club	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Oxalis priceae ssp colorea	Large-flowered wood sorrel	O	F1	Mixed Landscapes	3	3	3	3	3	3	3

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Panax quinquefolius	Ginseng	O	F2	Basic Mesic Forests	3	3	3	3	2	3	3
Panax quinquefolius	Ginseng	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Parnassia asarifolia	Kidneyleaf grass-of-parnassus	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Parnassia asarifolia	Kidneyleaf grass-of-parnassus	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Pellaea atropurpurea	Purple-stem cliffbreak	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Phacelia dubia	Phacelia	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Phacelia dubia var dubia	Phacelia	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Phaseolus polystachios	Wild kidney bean	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Phaseolus polystachios	Wild kidney bean	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Phaseolus polystachios	Wild kidney bean	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Philadelphus inodorus	Mock orange	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Plantago cordata	Heartleaf plantain	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Plantago cordata	Heartleaf plantain	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Plantago cordata	Heartleaf plantain	O	F1	River Channels	1	1	1	1	1	1	1
Platanthera cristata	Yellow-crested orchid	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Platanthera flava	Southern rein orchid	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Platanthera flava	Southern rein orchid	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Platanthera integrilabia	White fringeless orchid	S	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Platanthera peramoena	Purple fringeless orchid	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Prunus alabamensis	Alabama plum	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4
Pyrularia pubera	Buffalo nut	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Pyrularia pubera	Buffalo nut	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Rhododendron alabamense	Alabama azalea	O	F3	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Rhododendron alabamense	Alabama azalea	O	F3	Late Successional Riparian	5	5	5	5	5	5	5
Rhododendron arborescens	Smooth azalea	O	F2	River Channels	2	2	2	2	2	2	2
Rhododendron arborescens	Smooth azalea	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Rhododendron arborescens	Smooth azalea	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Rhododendron cumberlandense	Cumberland azalea	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Rhododendron minus	Dwarf rhododendron	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Rhododendron minus	Dwarf rhododendron	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Rhododendron minus	Dwarf rhododendron	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Rhynchosia tomentosa	Hairy snoutbean	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Ribes curvatum	Granite gooseberry	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Robinia hispida var rosea	Purple Bristly locust	O	F1	Mountain Longleaf Pine Forests	3	3	2	3	3	3	3
Robinia viscosa	Clammy locust	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Robinia viscosa var. hartwegii	Hartweg's locust	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Rosa setigera	Prairie rose	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Rubus lucidus	Southern dewberry	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Rudbeckia auriculata	Eared coneflower	S	F1	River Channels	1	1	1	1	1	1	1
Rudbeckia triloba var. pinnatiloba	Pinnately-lobed brown-eyed sunflower	S	F1	Glades and Barrens	2	2	2	2	2	2	2
Rudbeckia triloba var. pinnatiloba	Pinnately-lobed brown-eyed sunflower	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Sabatia capitata	Rose pink	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Sabatia capitata	Rose pink	S	F1	Glades and Barrens	2	2	2	2	2	2	2
Salix humilis	Prairie willow	O	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Salvia urticifolia	Nettle-leaf sage	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Salvia urticifolia	Nettle-leaf sage	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Salvia urticifolia	Nettle-leaf sage	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Scirpus purshianus	Weak-stalk bullrush	O	F1	Open Wetlands	1	1	1	1	1	1	1
Scutellaria alabamensis	Alabama skullcap	S	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Sedum nevii	Nevius' stonecrop	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Sideroxylon lycioides	Southern buckthorn	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Silphium trifoliatum var latifolium	Rosinweed	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Silphium trifoliatum var latifolium	Rosinweed	O	F1	Mountain Longleaf Pine Forests	3	3	2	3	3	3	3
Smilax smallii	Lance-leaf greenbriar	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Smilax smallii	Lance-leaf greenbriar	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Solidago arguta var caroliniana	Sharp-leaved goldenrod	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Solidago sphacelata	False goldenrod	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Solidago sphacelata	False goldenrod	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Spigelia marilandica	Pink root	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Spiranthes ovalis	Oval ladies'-tresses	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Spiranthes ovalis	Oval ladies'-tresses	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Stachys eplingii	Epling's hedge-nettle	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Styrax grandifolius	Bigleaf snowbell	O	F2	Mature Oak Forests	4	4	4	4	4	4	4
Styrax grandifolius	Bigleaf snowbell	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Symplocos tinctoria	Horse sugar	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Symplocos tinctoria	Horse sugar	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Talinum teretifolium	Roundleaf flame-flower	O	F2	Glades and Barrens	3	3	3	3	3	3	3
Tetragonotheca helianthoides	Pineland squarehead	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Tetragonotheca helianthoides	Pineland squarehead	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Thalictrum macrostylum	Piedmont meadowrue	O	F1	Mature Oak Forests	3	3	3	3	3	3	3
Thalictrum macrostylum	Piedmont meadowrue	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Thaspium pinnatifidum	Mountain thaspium	S	F1	Glades and Barrens	2	2	2	2	2	2	2
Thaspium pinnatifidum	Mountain thaspium	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Trichomanes boschianum	Bristle fern	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Trichomanes petersii	Dwarf filmy fern	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Trillium catesbaei	Catesby's trillium	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Trillium cuneatum	Little Sweet Betsy	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Trillium cuneatum	Little Sweet Betsy	O	F2	Basic Mesic Forests	3	3	3	3	2	3	3
Trillium cuneatum	Little Sweet Betsy	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Trillium lancifolium	Narrow-leaved trillium	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Trillium rugelii	Southern nodding trillium	S	F1	Basic Mesic Forests	2	2	2	2	1	2	2

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Trillium rugelii	Southern nodding trillium	S	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Triphora trianthophora	Nodding pogonia	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Ulmus americana	American elm	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Utricularia biflora	Two-flowered bladderwort	O	F1	Open Wetlands	1	1	1	1	1	1	1
Vernonia noveboracensis	New York ironweed	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Veronicastrum virginicum	Culver's root	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Veronicastrum virginicum	Culver's root	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Veronicastrum virginicum	Culver's root	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Woodwardia areolata	Netted chain fern	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Xanthorhiza simplicissima	Yellow-root	O	F2	Early-Successional Riparian	2	2	2	2	2	2	2
Xanthorhiza simplicissima	Yellow-root	O	F2	Bogs, Fens, Seeps, Seasonal Ponds	2	2	2	2	2	2	2
Xanthorhiza simplicissima	Yellow-root	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Xerophyllum asphodeloides	Eastern turkey beard	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Zigadenus leimanthoides	Pinebarren death-camas	O	F1	Glades and Barrens	2	2	2	2	2	2	2
Zigadenus leimanthoides	Pinebarren death-camas	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Plants--Nonvascular											
Amphidium mougeoth	A moss	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Amphidium mougeoth	A moss	O	F1	Basic Mesic Forests	2	2	2	2	1	2	2
Asplenium trichomanes	Maidenhair spleenwort	O	F2	Spray Cliffs	3	3	3	3	3	3	3
Asplenium trichomanes	Maidenhair spleenwort	O	F2	Late Successional Riparian	4	4	4	4	4	4	4
Dennstaedtia punctilobula	Hay-scented fern	O	F2	Rock Outcrops and Cliffs	3	3	3	3	3	3	3

Appendix F, Table L-D. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Talladega Division of the Talladega National Forest.

					Viability Risk by Alternative						
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Diphasiastrum digitatum	Fan clubmoss	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Diphasiastrum digitatum	Fan clubmoss	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Diphasiastrum digitatum	Fan clubmoss	O	F2	Mountain Longleaf Pine Forests	4	4	3	4	4	4	4
Sphagnum girgensohnii	Girgensohn's peatmoss	O	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Sphagnum girgensohnii	Girgensohn's peatmoss	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Tetrodontium brownianum	Little Georgia moss	S	F1	Late Successional Riparian	3	3	3	3	3	3	3
Tetrodontium brownianum	Little Georgia moss	S	F1	Rock Outcrops and Cliffs	2	2	2	2	2	2	2
Tetrodontium brownianum	Little Georgia moss	S	F1	Spray Cliffs	2	2	2	2	2	2	2

Appendix F, Table L-E. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Tuskegee National Forest.											
						Viability Risk by Alternative					
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Mammals											
Mustela frenata	Long-tailed weasel	O	F3	Mature Mesic Hardwood Forests	4	4	4	4	4	4	4
Mustela frenata	Long-tailed weasel	O	F3	Downed Wood	5	5	5	5	5	5	5
Mustela frenata	Long-tailed weasel	O	F3	Mixed Landscapes	5	5	5	5	5	5	5
Mustela frenata	Long-tailed weasel	O	F3	Early-Successional Forests	5	5	5	4	5	3	5
Mustela frenata	Long-tailed weasel	O	F3	Coastal Plain Ponds and Swamps	3	3	3	3	3	3	3
Myotis lucifugus	Little brown bat	O	F2	Den Trees	4	4	4	4	4	4	4
Myotis lucifugus	Little brown bat	O	F2	Snags	4	4	4	4	4	4	4
Myotis lucifugus	Little brown bat	O	F2	Open Wetlands	2	2	2	2	2	2	2
Tadarida brasiliensis	Brazilian free-tailed bat	O	F3	Den Trees	5	5	5	5	5	5	5
Tadarida brasiliensis	Brazilian free-tailed bat	O	F3	Mixed Landscapes	5	5	5	5	5	5	5
Tadarida brasiliensis	Brazilian free-tailed bat	O	F3	Snags	5	5	5	5	5	5	5
Birds											
Caprimulgus carolinensis	Chuck-wills-widow	O	F?	Mature Yellow Pine Forests	3	3	3	3	3	3	3
Caprimulgus carolinensis	Chuck-wills-widow	O	F?	Mixed Landscapes	3	3	3	3	3	3	3
Mycteria americana	Wood stork	F	F2	Open Wetlands	2	2	2	2	2	2	2
Sitta pusilla	Brown-headed nuthatch	O	F2	Woodlands, Savannas, and Grasslands	2	4	2	3	2	3	3
Sitta pusilla	Brown-headed nuthatch	O	F2	Longleaf Pine Forests	4	4	4	4	4	4	4
Sitta pusilla	Brown-headed nuthatch	O	F2	Mature Yellow Pine Forests	4	4	4	4	4	4	4
Wilsonia citrina	Hooded warbler	O	F3	Mature Forest Interiors	4	4	3	3	3	3	3
Wilsonia citrina	Hooded warbler	O	F3	Canopy Gaps	4	4	4	4	4	4	4
Wilsonia citrina	Hooded warbler	O	F3	Mature Oak Forests	4	4	4	4	4	4	4
Wilsonia citrina	Hooded warbler	O	F3	Early-Successional Forests	5	5	5	4	5	3	5
Reptiles											
Lampropeltis getulus getulus	Eastern kingsnake	O	F3	Early-Successional Riparian	3	3	3	3	3	3	3
Lampropeltis getulus getulus	Eastern kingsnake	O	F3	Coastal Plain Ponds and Swamps	3	3	3	3	3	3	3
Lampropeltis getulus getulus	Eastern kingsnake	O	F3	Woodlands, Savannas, and Grasslands	3	5	3	4	3	4	4

Appendix F, Table L-E. Risk to species viability for each species/habitat relationship by forest plan revision alternative for the Tuskegee National Forest.

						Viability Risk by Alternative					
Scientific Name	**Common Name**	**Status**	**FRank**	**Habitat Element**	**A**	**B**	**D**	**E**	**F**	**G**	**I**
Plants--Vascular											
Amsonia rigida	Stiff Blue-star	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Amsonia rigida	Stiff Blue-star	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Amsonia rigida	Stiff Blue-star	O	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Baptisia megacarpa	Appalachicola wild indigo	S	F1	Early-Successional Riparian	1	1	1	1	1	1	1
Baptisia megacarpa	Appalachicola wild indigo	S	F1	Open Wetlands	1	1	1	1	1	1	1
Hexastylis shuttleworthii var. harperi	Harper's wild ginger	O	F1	Bogs, Fens, Seeps, Seasonal Ponds	1	1	1	1	1	1	1
Hexastylis shuttleworthii var. harperi	Harper's wild ginger	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Hexastylis speciosa	Harper's heartleaf	S	F1	Baygalls and Bayheads	2	2	1	2	2	2	2
Hymenocallis caroliniana	Carolina spider lily	O	F1	Coastal Plain Ponds and Swamps	1	1	1	1	1	1	1
Hymenocallis caroliniana	Carolina spider lily	O	F1	Open Wetlands	1	1	1	1	1	1	1
Rhapidophyllum hystrix	Needlepalm	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Rhododendron alabamense	Alabama azalea	O	F1	Mature Mesic Hardwood Forests	2	2	2	2	2	2	2
Rhododendron alabamense	Alabama azalea	O	F1	Late Successional Riparian	3	3	3	3	3	3	3
Rudbeckia heliopsidis	Sun-facing coneflower	S	F1	Woodlands, Savannas, and Grasslands	1	3	1	2	1	2	2
Rudbeckia heliopsidis	Sun-facing coneflower	S	F1	Early-Successional Forests	3	3	3	2	3	1	3
Smilax smallii	Lance-leaf greenbriar	O	F2	Mature Mesic Hardwood Forests	3	3	3	3	3	3	3
Smilax smallii	Lance-leaf greenbriar	O	F2	Late Successional Riparian	4	4	4	4	4	4	4

Appendix G
Aquatic Species Viability

Aquatic viability rankings for each aquatic PETS or rare species analyzed by 5th code watersheds of the National Forests in Alabama. Sources of impairment are indicated within each risk category as follows: S= sediment, P = point source pollution, T = temperature, F = altered flow. Riparian sensitivity codes include: L = large woody debris; S = small woody debris; C = cover or shading. Federal status includes E = endangered, T = threatened, P = proposed, S = sensitive, R = rare.

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Ambystoma tigrinum	Eastern tiger salamander	R	G5T5	pond									Lower Conecuh	SPTF				
Ambystoma tigrinum	Eastern tiger salamander	R	G5T5	pond									Upper Terrapin	STF		P		
Ambystoma tigrinum	Eastern tiger salamander	R	G5T5	pond									Tallaseehatchee_Sh	S		PTF		
Ambystoma tigrinum	Eastern tiger salamander	R	G5T5	pond									Chewacla	ST		PF		
Ambystoma tigrinum	Eastern tiger salamander	R	G5T5	pond									Uphapee	STF		P		
Amphiuma means	Two-toed Amphiuma		G5	swamp		X						LS	Yellow	STF		P		
Amphiuma means	Two-toed Amphiuma		G5	swamp		X						LS	North	SPTF				
Amphiuma means	Two-toed Amphiuma		G5	swamp		X						LS	Five Runs	STF		P		
Amphiuma means	Two-toed Amphiuma		G5	swamp		X						LS	Lower Yellow	SPTF				

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Amphiuma means	Two-toed Amphiuma		G5	swamp		X						LS	Blackwater_Co	SPTF				
Amphiuma means	Two-toed Amphiuma		G5	swamp		X						LS	Sweetwater	SPTF				
Amphiuma means	Two-toed Amphiuma		G5	swamp		X						LS	Upper Conecuh	SPTF				
Amphiuma means	Two-toed Amphiuma		G5	swamp		X						LS	Lower Conecuh	PT				SF
Desmognathus aeneus	Seepage salamander	RM	G3G4	seep sp-stream ravines	X					X		C	Upper Terrapin	STF		P		
Desmognathus aeneus	Seepage salamander	RM	G3G4	seep sp-stream ravines	X					X		C	Tallaseehatchee_Sh	S		PTF		
Desmognathus aeneus	Seepage salamander	RM	G3G4	seep sp-stream ravines	X					X		C	Upper Choccolocco	SPTF				
Desmognathus aeneus	Seepage salamander	RM	G3G4	seep sp-stream ravines	X					X		C	Middle Choccolocco	STF		P		
Desmognathus aeneus	Seepage salamander	RM	G3G4	seep sp-stream ravines	X					X		C	Upper Hatchet	STF		P		
Desmognathus aeneus	Seepage salamander	RM	G3G4	seep sp-stream ravines	X					X		C	Muscadine	SPTF				
Desmognathus aeneus	Seepage salamander	RM	G3G4	seep sp-stream ravines	X					X		C	Cane	SPTF				

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Desmognathus aeneus	Seepage salamander	R	G3G4	seep sp-stream ravines	X					X		C	Cahulga	STF		P		
Desmognathus aeneus	Seepage salamander	RM	G3G4	seep sp-stream ravines	X					X		C	Chulafinnee	STF		P		
Necturus alabamensis	Black Warrior waterdog	SRC	G2	river	X	X			X		X	LS	Upper Sipsey Fork	PT	SF			
Necturus alabamensis	Black Warrior waterdog	SRC	G2	river	X	X			X		X	LS	Lower Sipsey Fork	P		T		F
Necturus alabamensis	Black Warrior waterdog	SRC	G2	river	X	X			X		X	LS	Upper Brushy	PT	SF			
Necturus alabamensis	Black Warrior waterdog	SRC	G2	river	X	X			X		X	LS	Lower Brushy	P		ST	P	F
Pseudotriton montanus	Eastern mud salamander		G5	pond swamp							X	LS	Upper Conecuh	PTF				
Pseudotriton montanus	Eastern mud salamander		G5	pond swamp							X	LS	Lower Conecuh	SPTF				
Pseudotriton montanus	Eastern mud salamander		G5	pond swamp							X	LS	Talladega	STF		P		
Pseudotriton montanus	Eastern mud salamander		G5	pond swamp							X	LS	Muscadine	SPTF				
Pseudotriton montanus	Eastern mud salamander		G5	pond swamp							X	LS	Cane	SPTF				
Pseudotriton montanus	Eastern mud salamander		G5	pond swamp							X	LS	Chewacla	ST		PF		

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Pseudotriton montanus	Eastern mud salamander		G5	pond swamp							X	LS	Uphapee	STF		P		
Rana capito sevosa	Dusky gopher frog	S	G1	ponds		X			X			L	Yellow	ST		PF		
Rana capito sevosa	Dusky gopher frog	S	G1	ponds		X			X			L	North	SPTF				
Rana capito sevosa	Dusky gopher frog	S	G1	ponds		X			X			L	Five Runs	STF		P		
Rana capito sevosa	Dusky gopher frog	S	G1	ponds		X			X			L	Lower Yellow	PTF				S
Rana capito sevosa	Dusky gopher frog	S	G1	ponds		X			X			L	Blackwater_Co	SPTF				
Rana capito sevosa	Dusky gopher frog	S	G1	ponds		X			X			L	Upper Conecuh	PTF				S
Rana capito sevosa	Dusky gopher frog	S	G1	ponds		X			X			L	Lower Conecuh	SPTF				
Cambarus englishi	a crayfish	S	G3	stream									Muscadine	PTF				S
Cambarus englishi	a crayfish	S	G3	stream									Cane	SPTF				
Cambarus englishi	a crayfish	S	G3	stream									Cahulga	STF		P		
Cambarus englishi	a crayfish	S	G3	stream									Chulafinnee	STF		P		
Cambarus englishi	a crayfish	S	G3	stream									Ketchepedrakee	STF		P		
Cambarus halli	a crayfish	R	G3G4	stream									Muscadine	PTF				S
Cambarus halli	a crayfish	R	G3G4	stream									Cane	SPTF				
Cambarus halli	a crayfish	R	G3G4	stream									Cahulga	STF		P		
Cambarus halli	a crayfish	R	G3G4	stream									Chulafinnee	STF		P		

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Cambarus halli	a crayfish	R	G3G4	stream									Ketchepedrakee	STF		P		
Cambarus miltus	Rusty Grave Digger Crayfish	S	G2	bog stream		X					C		Yellow	TF				S
Cambarus miltus	Rusty Grave Digger Crayfish	S	G2	bog stream		X					C		North	PTF				S
Cambarus miltus	Rusty Grave Digger Crayfish	S	G2	bog stream		X					C		Five Runs	STF				
Cambarus miltus	Rusty Grave Digger Crayfish	S	G2	bog stream		X					C		Lower Yellow	PTF				S
Cambarus miltus	Rusty Grave Digger Crayfish	S	G2	bog stream		X					C		Blackwater_Co	SPTF				
Cambarus miltus	Rusty Grave Digger Crayfish	S	G2	bog stream		X					C		Sweetwater	PTF				S
Cambarus miltus	Rusty Grave Digger Crayfish	S	G2	bog stream		X					C		Upper Conecuh	TF				S
Cambarus miltus	Rusty Grave Digger Crayfish	S	G2	bog stream		X					C		Lower Conecuh	PT				SF
Cambarus speciosus	a crayfish		G2	stream	X						C		Muscadine	PTF				S
Cambarus speciosus	a crayfish		G2	stream	X						C		Cane	SPTF				
Cambarus speciosus	a crayfish		G2	stream	X						C		Cahulga	STF		P		
Cambarus speciosus	a crayfish		G2	stream	X						C		Chulafinnee	STF		P		
Cambarus speciosus	a crayfish		G2	stream	X						C		Ketchepedrakee	STF		P		
Orconectes holti	a crayfish		G3	stream									Lower Mulberry	PTF				S
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Yellow	TF		P		S

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									North	PTF				S
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Five Runs	STF		P		
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Lower Yellow	PTF				S
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Blackwater_Co	SPTF				
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Sweetwater	PTF				S
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Upper Conecuh	PTF				S
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Lower Conecuh	PT				SF
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Affonee	SPTF				

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Gully	SPTF				
Procambarus marthae	a crayfish	S	G3	stream ditches oxbow swamp									Cahaba	PTF				S
Acipenser oxyrinchus desotoi	Gulf sturgeon	T	G3T2	river	X				X	X			Yellow	TF		P		S
Acipenser oxyrinchus desotoi	Gulf sturgeon	T	G3T2	river	X				X	X			North	PTF				S
Acipenser oxyrinchus desotoi	Gulf sturgeon	T	G3T2	river	X				X	X			Five Runs	STF		P		
Acipenser oxyrinchus desotoi	Gulf sturgeon	T	G3T2	river	X				X	X			Lower Yellow	PTF				S
Acipenser oxyrinchus desotoi	Gulf sturgeon	T	G3T2	river	X				X	X			Blackwater_Co	SPTF				
Acipenser oxyrinchus desotoi	Gulf sturgeon	T	G3T2	river	X				X	X			Lower Conecuh	PT				SF
Acipenser oxyrinchus desotoi	Gulf sturgeon	T	G3T2	river	X				X	X			Cahaba	PTF				S
Alosa alabamae	Alabama shad	SPT	G3	river oxbow									Lower Conecuh	PT				SF
Alosa alabamae	Alabama shad	SPT	G3	river oxbow									Affonee	SPTF				
Alosa alabamae	Alabama shad	SPT	G3	river oxbow									Gully	SPTF				
Alosa alabamae	Alabama shad	SPT	G3	river oxbow									Cahaba	PTF				S
Crystallaria asprella	crystal darter	S	G3	river	X				X				Lower Conecuh	PT				SF

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Crystallaria asprella	crystal darter	S	G3	river	X				X				Affonee	SPTF				
Crystallaria asprella	crystal darter	S	G3	river	X				X				Gully	SPTF				
Crystallaria asprella	crystal darter	S	G3	river	X				X				Cahaba	PTF				S
Crystallaria asprella	crystal darter	S	G3	river	X				X				Little Oakmulgee	SPTF				
Crystallaria asprella	crystal darter	S	G3	river	X				X				Uphapee	TF	S	P		F
Cyprinella caerulea	blue shiner	T	G2	river	X			X	X	X	X	L	Upper Choccolocco	SPTF				
Cyprinella caerulea	blue shiner	T	G2	river	X			X	X	X	X	L	Middle Choccolocco	S		PF		T
Cyprinella caerulea	blue shiner	T	G2	river	X			X	X	X	X	L	Cheaha	SP		TF		
Cyprinella caerulea	blue shiner	T	G2	river	X			X	X	X	X	L	Tallaseehatchee_Ta	S		PTF		
Cyprinella caerulea	blue shiner	T	G2	river	X			X	X	X	X	L	Upper Hatchet	TF		P		S
Cyprinella caerulea	blue shiner	T	G2	river	X			X	X	X	X	L	Affonee	SPTF				
Cyprinella caerulea	blue shiner	T	G2	river	X			X	X	X	X	L	Gully	SPTF				
Etheostoma bifascia	Florida sand darter	S	G3	stream								LS	Yellow	TF		P		S
Etheostoma bifascia	Florida sand darter	S	G3	stream								LS	North	PTF				S
Etheostoma bifascia	Florida sand darter	S	G3	stream								L	Five Runs	STF		P		
Etheostoma bifascia	Florida sand darter	S	G3	stream									Lower Yellow	PTF				S
Etheostoma bifascia	Florida sand darter	S	G3	stream									Upper Conecuh	PTF				S

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Etheostoma bifascia	Florida sand darter	S	G3	stream									Lower Conecuh	PT				SF
Etheostoma brevirostrum	holiday darter	S	G2	stream	X								Upper Choccolocco	SPTF				
Etheostoma chuckwachatte	lipstick darter	R	G2G3	stream	X								Talladega	STF		P		
Etheostoma chuckwachatte	lipstick darter	R	G2G3	stream	X								Upper Hatchet	TF		P		S
Etheostoma chuckwachatte	lipstick darter	R	G2G3	stream	X								Muscadine	PTF				S
Etheostoma chuckwachatte	lipstick darter	R	G2G3	stream	X								Cane	SPTF				
Etheostoma chuckwachatte	lipstick darter	R	G2G3	stream	X								Cahulga	STF		P		
Etheostoma davisoni	Choctawhachee darter	S	G3	stream river								L	Yellow	TF		P		S
Etheostoma davisoni	Choctawhachee darter	S	G3	stream river								L	North	PTF				S
Etheostoma davisoni	Choctawhachee darter	S	G3	stream river								L	Five Runs	STF		P		
Etheostoma davisoni	Choctawhachee darter	S	G3	stream river								L	Lower Yellow	PTF				S
Etheostoma davisoni	Choctawhachee darter	S	G3	stream river								L	Lower Conecuh	PT				SF
Etheostoma ditrema	coldwater darter	S	G1G2	spring sp-stream	X	X			X	X			Upper Terrapin	STF		P		
Etheostoma ditrema	coldwater darter	S	G1G2	spring sp-stream	X	X			X	X			Upper Choccolocco	SPTF				
Etheostoma ditrema	coldwater darter	S	G1G2	spring sp-stream	X	X			X	X			Middle Choccolocco	SF		P	T	

SCIENTIFIC NAME	COMMON NAME	Fed Status	Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Etheostoma ditrema	coldwater darter	S	G1G2	spring sp-stream	X	X			X	X			Tallaseehatchee_Ta	SF		PT		
Etheostoma douglasi	Tuskaloosa darter	S	G2	stream									Upper Sipsey Fork	PT	SF			
Etheostoma douglasi	Tuskaloosa darter	S	G2	stream									Upper Brushy	PT	SF			
Etheostoma douglasi	Tuskaloosa darter	S	G2	stream									Lower Brushy	P		ST	P	F
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Five Runs	STF		P		
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Upper Conecuh	PTF				S
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Lower Conecuh	PT				SF
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Lower Mulberry	PTF				S
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Affonee	SPTF				
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Cahaba	PTF			S	
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Sandy	SPTF				
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Elliotts	SPF	T			
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Fivemile	SPTF				
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Big Brush	PTF		S		

SCIENTIFIC NAME	COMMON NAME	Fed Status	Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Chewacla	TF		SPF		
Etheostoma parvapinne	Goldstripe darter	S	G1G2	stream					X	X		LS	Uphapee	TFS	S	P		F
Etheostoma phytophyllum	Rush darter	S	G1G2	stream sp-stream	X				X	X			Clear	P		T	S	
Etheostoma ramseyi	Alabama darter	S	G4	stream								L	Lower Mulberry	PTF				S
Etheostoma ramseyi	Alabama darter	S	G4	stream								L	Affonee	SPTF				
Etheostoma ramseyi	Alabama darter	S	G4	stream								L	Gully	SPTF				
Etheostoma ramseyi	Alabama darter	S	G4	stream								L	Cahaba	PTF				S
Etheostoma ramseyi	Alabama darter	S	G4	stream								L	Little Oakmulgee	SPTF				
Etheostoma sp.cf. bellator 1	Sipsey darter	S	G2	stream river	X								Upper Sipsey Fork	PT	SF			
Etheostoma sp.cf.zonistium	Blueface darter	R	G2	stream	X		X			X	C		Upper Sipsey Fork	PT	SF			
Etheostoma sp.cf.zonistium	Blueface darter	R	G2	stream	X		X			X	C		Upper Bear			PTF		S
Etheostoma tuscumbia	Tuscumbia darter	S	GS	sp-stream	X	X			X	X			Town	P				ST
Etheostoma zonifer	backwater darter	S	G3G4	stream									Cahaba	PTF			S	
Etheostoma zonifer	backwater darter	S	G3G4	stream									Little Oakmulgee	SPTF				

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Etheostoma zonifer	backwater darter	S	G3G4	stream									Chewacla	T		SPF		
Etheostoma zonifer	backwater darter	S	G3G4	stream									Uphapee	TF	S	P		F
Hybognathus nuchalis	Mississippi silvery minnow	R	G2	stream river									Cahaba	PTF				S
Hybognathus nuchalis	Mississippi silvery minnow	R	G2	stream river									Little Oakmulgee	SPTF				
Hybognathus nuchalis	Mississippi silvery minnow	R	G2	stream river									Sandy	SPTF				
Hybognathus nuchalis	Mississippi silvery minnow	R	G2	stream river									Chewacla	T		SPF		
Hybopsis lineapunctata	Lined chub	S	G3	stream									Upper Choccolocco	SPTF				
Hybopsis lineapunctata	Lined chub	S	G3	stream									Middle Choccolocco	S		PF	T	
Hybopsis lineapunctata	Lined chub	S	G3	stream									Cheaha	SP		TF		
Hybopsis lineapunctata	Lined chub	S	G3	stream									Talladega	SF		P	T	
Hybopsis lineapunctata	Lined chub	S	G3	stream									Tallaseehatchee_Ta	S		PTF		
Hybopsis lineapunctata	Lined chub	S	G3	stream									Upper Hatchet	TF		P		S
Hybopsis lineapunctata	Lined chub	S	G3	stream									Cahulga	S		PTF		
Hybopsis lineapunctata	Lined chub	S	G3	stream									Chulafinnee	S		PTF		

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Hybopsis lineapunctata	Lined chub	S	G3	stream									Ketchepedrakee	STF		P		
Notropis cahabae	Cahaba shiner	E	G2	river	X				X				Gully	SPTF				
Notropis cahabae	Cahaba shiner	E	G2	river	X				X				Cahaba	PTF				S
Notropis uranoscopus	skygazer shiner	S	G2	river									Affonee	SPTF				
Notropis uranoscopus	skygazer shiner	S	G2	river									Gully	SPTF				
Notropis uranoscopus	skygazer shiner	S	G2	river									Cahaba	PTF				S
Notropis uranoscopus	skygazer shiner	S	G2	river									Little Oakmulgee	SPTF				
Notropis uranoscopus	skygazer shiner	S	G2	river									Chewacla	T		SPF		
Noturus munitus	Frecklebelly madtom	S	G3	river									Gully	SPTF				
Noturus munitus	Frecklebelly madtom	S	G3	river									Cahaba	PTF				S
Percina aurolineata	goldline darter	T	G2	river	X		X						Affonee	SPTF				
Percina aurolineata	goldline darter	T	G2	river	X		X						Gully	SPTF				
Percina aurolineata	goldline darter	T	G2	river	X		X						Cahaba	PTF				S
Percina austroperca	Southern logperch	S	G3	river									Lower Conecuh	PT				S
Percina brevicauda	Coal darter	S	G2	river			X						Middle Choccolocco	STF		PF		
Percina brevicauda	Coal darter	S	G2	river			X						Cheaha	SPTF		F		

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Percina brevicauda	Coal darter	S	G2	river			X						Talladega	STF		P		
Percina brevicauda	Coal darter	S	G2	river			X						Tallaseehatchee_Ta	ST		PF		
Percina brevicauda	Coal darter			river			X						Upper Hatchet	TF				S
Percina brevicauda	Coal darter	S	G2	river			X						Affonee	SPTF				
Percina brevicauda	Coal darter	S	G2	river			X						Gully	SPTF				
Percina lenticula	freckled darter	S	G2	river			X					L	Talladega	STF		P		
Percina lenticula	freckled darter	S	G2	river			X					L	Tallaseehatchee_Ta	ST		PF		
Percina lenticula	freckled darter	S	G2	river			X					L	Affonee	SPTF				
Percina lenticula	freckled darter	S	G2	river			X					L	Gully	SPTF				
Percina lenticula	freckled darter	S	G2	river			X					L	Cahaba	PTF				S
Percina lenticula	Freckled darter	S	G2	river			X					L	Uphapee	TF	S	P		F
Percina palmaris	Bronze darter	S	G3	river									Upper Terrapin	STF		P		
Percina palmaris	Bronze darter	S	G3	river									Hurricane	T	F			SP
Percina palmaris	Bronze darter	S	G3	river									Upper Choccolocco	SPTF				
Percina palmaris	Bronze darter	S	G3	river									Middle Choccolocco	STF		P		
Percina palmaris	Bronze darter	S	G3	river									Cheaha	SPTF				
Percina palmaris	Bronze darter	S	G3	river									Talladega	STF		P		
Percina palmaris	Bronze darter	S	G3	river									Tallaseehatchee_Ta	STF		P		
Percina palmaris	Bronze darter	S	G3	river									Upper Hatchet	TF		P		S
Percina palmaris	Bronze darter	S	G3	river									Weogufka	PTF				S
Percina palmaris	Bronze darter	S	G3	river									Muscadine	PT		F		S

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Percina palmaris	Bronze darter	S	G3	river									Cane	SPTF		F		
Percina palmaris	Bronze darter	S	G3	river									Cahulga	ST		PF		
Percina palmaris	Bronze darter	S	G3	river									Chulafinnee	STF		P		
Percina palmaris	Bronze darter	S	G3	river									Ketchepedrakee	ST		PF		
Percina sp.cf. macrocephala 1	Warrior brindled darter	S	G3	river	X	X			X				Upper Sipsey Fork	PT	SF			
Percina sp.cf. macrocephala 2	Tallapoosa muscadine bridled darter	S	G3	river									Talladega	SF		P		
Percina sp.cf. macrocephala 2	Tallapoosa muscadine bridled darter	S	G3	river									Cane	SPTF				
Percina sp.cf. macrocephala 2	Tallapoosa muscadine bridled darter	S	G3	river									Cahulga	SF		PT		
Percina sp.cf. macrocephala 2	Tallapoosa muscadine bridled darter	S	G3	river									Chulafinnee	SF		PT		
Percina sp.cf. macrocephala 2	Tallapoosa muscadine bridled darter	S	G3	river									Ketchepedrakee	STF		P		
Scaphirhynchus suttkusi	Alabama sturgeon	E	G1	river	X		X		X				Cahaba	PTF				S
Alloperla furcula	a stonefly	R	G2	stream		X							Upper Conecuh	PTF				S
Alloperla furcula	a stonefly	R	G2	stream		X							Lower Conecuh	PT				SF
Baetisca becki	a mayfly	R	G2	stream	X	X	X		X				Yellow	TF		P		S
Baetisca becki	a mayfly	R	G2	stream	X	X	X		X				North	PTF				S
Baetisca becki	a mayfly	R	G2	stream	X	X	X		X				Five Runs	STF		P		
Baetisca becki	a mayfly	R	G2	stream	X	X	X		X				Lower Yellow	PTF				S

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Baetisca becki	a mayfly	R	G2	stream	X	X	X		X				Blackwater_Co	SPTF				
Baetisca becki	a mayfly	R	G2	stream	X	X	X		X				Upper Conecuh	PTF				S
Baetisca becki	a mayfly	R	G2	stream	X	X	X		X				Lower Conecuh	PT				SF
Beloneuria jamesae	Cheaha beloneurian stonefly	R	G1	stream									Upper Choccolocco	SPTF				
Beloneuria jamesae	Cheaha beloneurian stonefly	R	G1	stream									Middle Choccolocco	STF		P		
Beloneuria jamesae	Cheaha beloneurian stonefly	R	G1	stream									Cheaha	SPTF				
Beloneuria jamesae	Cheaha beloneurian stonefly	R	G1	stream									Talladega	STF		P		
Brachycentrus numerosus	a caddisfly	R	G1	river									Upper Conecuh	PTF				S
Brachycentrus numerosus	a caddisfly	R	G1	river									Affonee	SPTF				
Brachycentrus numerosus	a caddisfly	R	G1	river									Gully	SPTF				
Brachycentrus numerosus	a caddisfly	R	G1	river									Sandy	SPTF				
Brachycercus nasutus	a caddisfly	R	G2	river						X		C	Yellow	TF		P		S
Brachycercus nasutus	a caddisfly	R	G2	river						X		C	North	PTF				S
Brachycercus nasutus	a caddisfly	R	G2	river						X		C	Five Runs	STF		P		
Brachycercus nasutus	a caddisfly	R	G2	river						X		C	Lower Yellow	PTF				S

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Brachycercus nasutus	a caddisfly	R	G2	river						X		C	Upper Conecuh	PTF				S
Brachycercus nasutus	a caddisfly	R	G2	river						X		C	Lower Conecuh	PT				SF
Cheumatopsyche bibbensis	a caddisfly	S	G1	river stream									Affonee	SPTF				
Cheumatopsyche bibbensis	a caddisfly	S	G1	river stream									Gully	SPTF				
Cheumatopsyche bibbensis	a caddisfly	S	G1	river stream									Sandy	SPTF				
Cheumatopsyche helma	Helma's net-spinning caddisfly	S	G1G3	river stream									Cheaha	SPTF				
Cheumatopsyche helma	Helma's net-spinning caddisfly	S	G1G3	river stream									Talladega	STF		P		
Cheumatopsyche helma	Helma's net-spinning caddisfly	S	G1G3	river stream									Tallaseehatchee_Ta	STF		P		
Cheumatopsyche kinlockensis	a caddisfly	R	G2	stream									Upper Brushy	PT	SF			
Cheumatopsyche petersi	Peters' cheumatopsyche	R	G2	stream	X								Yellow	TF		P		S
Cheumatopsyche petersi	Peters' cheumatopsyche	R	G2	stream	X								North	PTF				S
Cheumatopsyche petersi	Peters' cheumatopsyche	R	G2	stream	X								Five Runs	STF		P		
Cheumatopsyche petersi	Peters' cheumatopsyche	R	G2	stream	X								Lower Yellow	PTF				S
Cheumatopsyche petersi	Peters' cheumatopsyche	R	G2	stream	X								Blackwater_Co	SPTF				

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Cheumatopsyche petersi	Peters' cheumatopsyche	R	G2	stream	X								Sweetwater	PTF				S
Cheumatopsyche petersi	Peters' cheumatopsyche	R	G2	stream	X								Upper Conecuh	PTF				S
Cheumatopsyche petersi	Peters' cheumatopsyche	R	G2	stream	X								Lower Conecuh	PT				SF
Cordulegaster sayi	Say's spiketail	S	G2	bog seeps forest clearings									Yellow	TF		P		S
Cordulegaster sayi	Say's spiketail	S	G2	bog seeps forest clearings									North	PTF				S
Cordulegaster sayi	Say's spiketail	S	G2	bog seeps forest clearings									Five Runs	STF		P		
Cordulegaster sayi	Say's spiketail	S	G2	bog seeps forest clearings									Lower Yellow	PTF				S
Cordulegaster sayi	Say's spiketail	S	G2	bog seeps forest clearings									Blackwater_Co	SPTF				
Cordulegaster sayi	Say's spiketail	S	G2	bog seeps forest clearings									Sweetwater	PTF				S
Cordulegaster sayi	Say's spiketail	S	G2	bog seeps forest clearings									Upper Conecuh	PTF				S

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Cordulegaster sayi	Say's spiketail	S	G2	bog seeps forest clearings									Lower Conecuh	PT				SF
Epitheca spinosa	Robust baskettail	S	G3	swamp									Yellow	TF		P		S
Epitheca spinosa	Robust baskettail	S	G3	swamp									North	PTF				S
Epitheca spinosa	Robust baskettail	S	G3	swamp									Five Runs	STF		P		
Epitheca spinosa	Robust baskettail	S	G3	swamp									Lower Yellow	PTF				S
Epitheca spinosa	Robust baskettail	S	G3	swamp									Blackwater_Co	SPTF				
Epitheca spinosa	Robust baskettail	S	G3	swamp									Sweetwater	PTF				S
Epitheca spinosa	Robust baskettail	S	G3	swamp									Upper Conecuh	PTF				S
Epitheca spinosa	Robust baskettail	S	G3	swamp									Lower Conecuh	PT				SF
Gomphus cavillaris brimleyi	a dragonfly			lake pond									Five Runs	STF		P		
Gomphus geminatus	Twin-striped clubtail	S	G3	stream									Yellow	TF		P		S
Gomphus geminatus	Twin-striped clubtail	S	G3	stream									North	PTF				S
Gomphus geminatus	Twin-striped clubtail	S	G3	stream									Five Runs	STF		P		
Gomphus geminatus	Twin-striped clubtail	S	G3	stream									Lower Yellow	PTF				S

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Gomphus geminatus	Twin-striped clubtail	S	G3	stream									Blackwater_Co	SPTF				
Gomphus geminatus	Twin-striped clubtail	S	G3	stream									Sweetwater	PTF				S
Gomphus geminatus	Twin-striped clubtail	S	G3	stream									Upper Conecuh	PTF				S
Gomphus geminatus	Twin-striped clubtail	S	G3	stream									Lower Conecuh	PT				SF
Gomphus hodgesi	Hodges' clubtail	S	G3	stream						X		C	Yellow	TF		P		S
Gomphus hodgesi	Hodges' clubtail	S	G3	stream						X		C	North	PTF				S
Gomphus hodgesi	Hodges' clubtail	S	G3	stream						X		C	Five Runs	STF		P		
Gomphus hodgesi	Hodges' clubtail	S	G3	stream						X		C	Lower Yellow	PTF				S
Gomphus hodgesi	Hodges' clubtail	S	G3	stream						X		C	Blackwater_Co	SPTF				
Gomphus hodgesi	Hodges' clubtail	S	G3	stream						X		C	Sweetwater	PTF				S
Gomphus hodgesi	Hodges' clubtail	S	G3	stream						X		C	Upper Conecuh	PTF				S
Gomphus hodgesi	Hodges' clubtail	S	G3	stream						X		C	Lower Conecuh	PT				SF
Gomphus hybridus	Cocoa clubtail	S	G4	river									Upper Conecuh	PTF				S
Gomphus hybridus	Cocoa clubtail	S	G4	river									Affonee	SPTF				
Gomphus hybridus	Cocoa clubtail	S	G4	river									Gully	SPTF				
Gomphus hybridus	Cocoa clubtail	S	G4	river									Sandy	SPTF				

SCIENTIFIC NAME	COMMON NAME	Fed Status	Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Gomphus parvidens	a dragonfly	R	G2	stream shrub-riparian	X				X				Upper Choccolocco	SPTF				
Gomphus parvidens	a dragonfly	R	G2	stream shrub-riparian	X				X				Middle Choccolocco	STF		P		
Gomphus parvidens	a dragonfly	R	G2	stream shrub-riparian	X				X				Lower Mulberry	PTF				S
Gomphus parvidens	a dragonfly	R	G2	stream shrub-riparian	X				X				Affonee	SPTF				
Gomphus parvidens	a dragonfly	R	G2	stream shrub-riparian	X				X				Gully	SPTF				
Gomphus parvidens	a dragonfly	R	G2	stream shrub-riparian	X				X				Little Oakmulgee	SPTF				
Gomphus septima	Septima's clubtail	R	G2	river			X						Upper Choccolocco	SPTF				
Gomphus septima	Septima's clubtail	R	G2	river			X						Affonee	SPTF				
Gomphus septima	Septima's clubtail	R	G2	river			X						Gully	SPTF				
Gomphus septima	Septima's clubtail	R	G2	river			X						Little Oakmulgee	SPTF				
Hydropsyche hageni	a caddisfly	S	G5	stream river									Cahaba	PTF				S

SCIENTIFIC NAME	COMMON NAME	Fed Status	Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Hydroptila berneri	Berner's microcaddisfly	R	G1	stream									Five Runs	STF		P		
Hydroptila berneri	Berner's microcaddisfly	R	G1	stream									Upper Choccolocco	SPTF				
Hydroptila berneri	Berner's microcaddisfly	R	G1	stream									Middle Choccolocco	STF		P		
Hydroptila cheaha	a caddisfly	S	G1	stream	X				X	X			Middle Choccolocco	STF		P		
Hydroptila cheaha	a caddisfly	S	G1	stream	X				X	X			Cheaha	SPTF				
Hydroptila cheaha	a caddisfly	S	G1	stream	X				X	X			Talladega	STF		P		
Hydroptila choccolocco	a caddisfly	S	G1	stream									Upper Choccolocco	SPTF				
Hydroptila choccolocco	a caddisfly	S	G1	stream	X	X			X	X			Middle Choccolocco	STF		P		
Hydroptila lagoi	a caddisfly	R	G1	sp-stream spring									Sandy	SPTF				
Hydroptila paralatosa	a caddisfly	S	G2	stream									Sandy	SPTF				
Hydroptila paralatosa	a caddisfly	S	G2	stream									Elliotts	SPTF				
Hydroptila paralatosa	a caddisfly	S	G2	stream									Upper Sipsey Fork	PT	SF			
Hydroptila paralatosa	a caddisfly	S	G2	stream									Lower Brushy	PT		S	P	F
Hydroptila patriciae	a caddisfly	S	G1	stream									Upper Choccolocco	SPTF				
Hydroptila patriciae	a caddisfly	S	G1	stream									Middle Choccolocco	STF		P		
Hydroptila patriciae	a caddisfly	S	G1	stream									Affonee	SPTF				
Hydroptila patriciae	a caddisfly	S	G1	stream									Gully	SPTF				
Hydroptila setigera	a caddisfly	S	G1	stream									Cane	SPTF				

SCIENTIFIC NAME	COMMON NAME	Fed Status	Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Hydroptila setigera	a caddisfly	S	G1	stream									Cahulga	STF		P		
Oecetis morsei	a caddisfly	S	G2	river									Affonee	SPTF				
Oecetis morsei	a caddisfly	S	G2	river									Gully	SPTF				
Ophiogomphus alleghaniensis	Allegheny snaketail	S	G3Q	stream	X								Upper Terrapin	STF		P		
Ophiogomphus alleghaniensis	Allegheny snaketail	S	G3Q	stream	X								Sandy	SPTF				
Ophiogomphus incurvatus	Appalachian snaketail	S	G3		X				X				Upper Terrapin	STF		P		
Ophiogomphus incurvatus	Appalachian snaketail	S	G3		X				X				Hurricane	TF				SP
Ophiogomphus incurvatus	Appalachian snaketail	S	G3		X				X				Upper Choccolocco	SPTF				
Ophiogomphus incurvatus	Appalachian snaketail	S	G3		X				X				Middle Choccolocco	STF		P		
Polycentropus carlsoni	Carlson's polycentropus caddisfly	S	G1G3	stream									Cane	SPTF				
Progomphus bellei	Belle's sanddragon	S	G3	sp-stream spring pond									Blackwater_Co	SPTF				
Rhyacophila carolae	A caddisfly	S	G1	stream									West Flint	P		T		SF
Rhyacophila carolae	A caddisfly	S	G1	stream									Town	P				ST
Somatochlora calverti	A dragonfly			seeps roadways		X							Five Runs	STF		P		

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Somatochlora provacans	treetop emerald dragonfly	S	G3	bog seeps spring sp-stream roadways clearings		X							Lower Conecuh	PT				SF
Somatochlora provacans	treetop emerald dragonfly	S	G3	bog seeps spring sp-stream roadways clearings		X							Affonee	SPTF				
Somatochlora provacans	treetop emerald dragonfly	S	G3	bog seeps spring sp-stream roadways clearings		X							Gully	SPTF				
Somatochlora provacans	treetop emerald dragonfly	S	G3	bog seeps spring sp-stream roadways clearings		X							Sandy	SPTF				
Stylurus laurae	Laura's clubtail	S	G3	stream								L	Lower Conecuh	PT				SF
Stylurus laurae	Laura's clubtail	S	G3	stream								L	Affonee	SPTF				
Stylurus laurae	Laura's clubtail	S	G3	stream								L	Gully	SPTF				
Stylurus laurae	Laura's clubtail	S	G3	stream								L	Sandy	SPTF				
Stylurus townesi	Townes' clubtail	S	G3	stream									Lower Conecuh	PT				SF
Anodontoides radiatus	rayed creekshell	S	G3	stream									Sandy	SPTF				

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Anodontoides radiatus	rayed creekshell	S	G3	stream									Chewacla	T		SP		F
Anodontoides radiatus	rayed creekshell	S	G3	stream									Uphapee	TF	S	P		F
Elliptio arca	Alabama spike	S	G3Q	stream									Upper Sipsey Fork	PT	SF			
Elliptio arca	Alabama spike	S	G3Q	stream									Lower Sipsey Fork	P		T		F
Elliptio arca	Alabama spike	S	G3Q	stream									Upper Bear			PTF		S
Elliptio arctata	Delicate spike		G3	stream		X							Cahaba	PTF				S
Elliptio arctata	Delicate spike		G3	stream		X							Uphapee	TF	S	P		
Elliptio arctata	Delicate spike			stream		X							Upper Sipsey Fork	PT	SF			
Elliptio arctata	Delicate spike		G3	stream		X							Upper Brushy	PT	SF			
Elliptio arctata	Delicate spike		G3	stream		X							Lower Brushy	P		ST	P	F
Epioblasma brevidens	Cumberlandian combshell	E	G1	river	X								Upper Bear			PTF		S
Epioblasma metastriata	Upland combshell	E	GH	river		X	X	X	X				Cahaba	PTF				S
Epioblasma othcaloogensis	Southern acornshell	E	GHQ	river	X	X		X	X				Upper Choccolocco	SPTF				
Epioblasma othcaloogensis	Southern acornshell		GHQ	river	X	X		X	X				Cahaba	PTF				S
Fusconaia succissa	Purple pigtoe	S	G3	stream river									Yellow	TF		P		S

SCIENTIFIC NAME	COMMON NAME	Fed Status	Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Fusconaia succissa	Purple pigtoe	S	G3	stream river									North	PTF				S
Fusconaia succissa	Purple pigtoe	S	G3	stream river									Five Runs	STF		P		
Fusconaia succissa	Purple pigtoe	S	G3	stream river									Lower Yellow	PTF				S
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Upper Terrapin	STF		P		
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Upper Choccolocco	SPTF				
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Middle Choccolocco	STF		PF		
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Cheaha	SPTF		F		
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Talladega	STF		P		
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Tallaseehatchee_Ta	ST		PF		
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Upper Hatchet	TF		P		S
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Muscadine	PTF				S
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Cane	SPTF				

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Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Chewacla	T		SPF		
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Uphapee	TF	S	P		F
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Upper Sipsey Fork	PT	SF			
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Lower Sipsey Fork	P	S	T		F
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Upper Brushy	PT	SF			
Lampsilis altilis	fine-lined pocketbook	T	G2	stream	X		X		X		X		Lower Brushy	P		ST	P	F
Lampsilis australis	Southern sandshell	S	G2	stream	X								Yellow	TF		P		S
Lampsilis australis	Southern sandshell	S	G2	stream	X								North	PTF				S
Lampsilis australis	Southern sandshell	S	G2	stream	X								Five Runs	STF		P		
Lampsilis australis	Southern sandshell	S	G2	stream	X								Lower Yellow	PTF				S
Lampsilis perovalis	orange-nacre mucket	T	G2	stream river	X				X				Cahaba	PTF				S
Lampsilis perovalis	orange-nacre mucket	T	G2	stream river	X				X				Big Brush	PT		SF		
Lampsilis perovalis	orange-nacre mucket	T	G2	stream river	X				X				Uphapee	TF	S	P		F
Lampsilis perovalis	orange-nacre mucket	T	G2	stream river	X				X				Upper Sipsey Fork	PT	SF			

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Lampsilis perovalis	orange-nacre mucket	T	G2	stream river	X				X				Lower Sipsey Fork	P	S	T		F
Lampsilis perovalis	orange-nacre mucket	T	G2	stream river	X				X				Upper Brushy	PT	SF			
Lampsilis perovalis	orange-nacre mucket	T	G2	stream river	X				X				Lower Brushy	P		ST	P	F
Lampsilis perovalis	orange-nacre mucket	T	G2	stream river	X				X				Clear	P		TF		S
Lampsilis virescens	Alabama lampmussel	E	G1	river									Upper Bear			PTF		S
Lasmigona complanta alabamensis	Alabama heelsplitter	S	G5T2T3	river									Affonee	SPTF				
Lasmigona complanta alabamensis	Alabama heelsplitter	S	G5T2T3	river									Chewacla	T		SPF		
Lasmigona complanta alabamensis	Alabama heelsplitter	S	G5T2T3	river									Uphapee	TF	S	P		
Lasmigona holstonia	Tennessee Heelsplitter	S	G3	stream									Upper Terrapin	STF		P		
Lasmigona holstonia	Tennessee Heelsplitter	S	G3	stream									Upper Choccolocco	SPTF				
Margaritifera marrianae	Alabama pearlshell	SC	G1	stream									Upper Conecuh	PTF				S
Margaritifera marrianae	Alabama pearlshell	SC	G1	stream									Lower Conecuh	PT				SF
Medionidus acutissimus	Alabama moccasinshell	T	G1	stream	X	X	X				X		Upper Choccolocco	SPTF				
Medionidus acutissimus	Alabama moccasinshell	T	G1	stream	X	X	X				X		Middle Choccolocco	ST		PF		

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Medionidus acutissimus	Alabama moccasinshell	T	G1	stream	X	X	X				X		Talladega	STF		P		
Medionidus acutissimus	Alabama moccasinshell	T	G1	stream	X	X	X				X		Upper Hatchet	TF		P		S
Medionidus acutissimus	Alabama moccasinshell	T	G1	stream	X	X	X				X		Upper Sipsey Fork	PT	SF			
Medionidus acutissimus	Alabama moccasinshell	T	G1	stream	X	X	X				X		Lower Sipsey Fork	P	S	T		F
Medionidus acutissimus	Alabama moccasinshell	T	G1	stream	X	X	X				X		Upper Brushy	PT	SF			
Medionidus acutissimus	Alabama moccasinshell	T	G1	stream	X	X	X				X		Lower Brushy	P		ST	P	F
Medionidus parvulus	Coosa moccasinshell	E	G1	stream	X	X	X						Upper Choccolocco	SPTF				
Medionidus parvulus	Coosa moccasinshell	E	G1	stream	X	X	X						Middle Choccolocco	ST		PF		
Medionidus parvulus	Coosa moccasinshell	E	G1	stream	X	X	X						Upper Hatchet	TF				S
Medionidus parvulus	Coosa moccasinshell	E	G1	stream	X	X	X						Upper Sipsey Fork	PT	SF			
Medionidus parvulus	Coosa moccasinshell	E	G1	stream	X	X	X						Lower Sipsey Fork	P	S	T		F
Obovaria jacksoniana	Southern hickorynut	S	G1G2	river									Cahaba	PTF				S
Obovaria jacksoniana	Southern hickorynut	S	G1G2	river									Upper Bear			PTF		S
Pleurobema decisum	Southern clubshell	E	G1G2	river stream	X		X	X					Upper Terrapin	STF		P		

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Pleurobema decisum	Southern clubshell	E	G1G2	river stream	X		X	X					Upper Choccolocco	SPTF				
Pleurobema decisum	Southern clubshell	E	G1G2	river stream	X		X	X					Middle Choccolocco	ST		PF		
Pleurobema decisum	Southern clubshell	E	G1G2	river stream	X		X	X					Cahaba	PTF				S
Pleurobema decisum	Southern clubshell	E	G1G2	river stream	X		X	X					Chewacla	T		SPF		
Pleurobema decisum	Southern clubshell	E	G1G2	river stream	X		X	X					Uphapee	TF	S	P		F
Pleurobema furvum	dark pigtoe	E	G1	stream river	X		X						Upper Sipsey Fork	PT	SF			
Pleurobema furvum	dark pigtoe	E	G1	stream river	X		X						Lower Sipsey Fork	P	S	T		F
Pleurobema furvum	dark pigtoe	E	G1	stream river	X		X						Upper Brushy	PT	SF			
Pleurobema furvum	dark pigtoe	E	G1	stream river	X		X						Lower Brushy	P		ST	P	F
Pleurobema furvum	dark pigtoe	E	G1	stream river	X		X						Clear	P		TF		S
Pleurobema georgianum	Southern pigtoe	E	G1	stream river	X			X					Upper Terrapin	STF		P		
Pleurobema georgianum	Southern pigtoe	E	G1	stream river	X			X					Upper Choccolocco	SPTF				

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Pleurobema georgianum	Southern pigtoe	E	G1	stream river	X			X					Middle Choccolocco	ST		PF		
Pleurobema georgianum	Southern pigtoe	E	G1	stream river	X			X					Upper Hatchet	TF		P		S
Pleurobema georgianum	Southern pigtoe	E	G1	stream river	X			X					Chewacla	T		SPF		
Pleurobema georgianum	Southern pigtoe	E	G1	stream river	X			X					Uphapee	TF	S	P		F
Pleurobema hanleyianum	Georgia pigtoe	C	G1	river									Upper Terrapin	STF		P		
Pleurobema hanleyianum	Georgia pigtoe	C	G1	river									Talladega	STF		P		
Pleurobema hanleyianum	Georgia pigtoe	C	G1	river									Upper Hatchet	TF		P		S
Pleurobema perovatum	Ovate clubshell	E	G1	river stream									Upper Terrapin	STF		P		
Pleurobema perovatum	Ovate clubshell	E	G1	river stream									Upper Choccolocco	SPTF				
Pleurobema perovatum	Ovate clubshell	E	G1	river stream									Chewacla	T		SPF		
Pleurobema perovatum	Ovate clubshell	E	G1	river stream									Uphapee	TF	S	P		F
Pleurobema perovatum	Ovate clubshell	E	G1	river stream									Upper Sipsey Fork	PT	SF			
Pleurobema perovatum	Ovate clubshell	E	G1	river stream									Upper Brushy	PT	SF			
Pleurobema perovatum	Ovate clubshell	E	G1	river stream									Lower Brushy	P		T	P	F

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Ptychobranchus greeni	Triangular kidneyshell	E	G1	stream river									Upper Terrapin	STF		P		
Ptychobranchus greeni	Triangular kidneyshell	E	G1	stream river									Upper Choccolocco	SPTF				
Ptychobranchus greeni	Triangular kidneyshell	E	G1	stream river									Middle Choccolocco	ST		PF		
Ptychobranchus greeni	Triangular kidneyshell	E	G1	stream river									Upper Sipsey Fork	PT	SF			
Ptychobranchus greeni	Triangular kidneyshell	E	G1	stream river									Lower Sipsey Fork	P	S	T		F
Ptychobranchus greeni	Triangular kidneyshell	E	G1	stream river									Upper Brushy	PT	SF			
Ptychobranchus greeni	Triangular kidneyshell	E	G1	stream river									Lower Brushy	P		ST	P	F
Ptychobranchus jonesi	Southern kidneyshell	S	G1	stream river								L	Lower Conecuh	PT				SF
Quadrula rumphiana	Ridged mapleleaf	S	G3	river									Upper Terrapin	STF		P		
Quadrula rumphiana	Ridged mapleleaf	S	G3	river									Cahaba	PTF				S
Strophitus connasaugaensis	Alabama creekmussel	S	G3	stream river reservoir									Upper Choccolocco	SPTF				
Strophitus connasaugaensis	Alabama creekmussel	S	G3	stream river reservoir									Cahaba	PTF				S
Strophitus subvexus	Southern creekmussel	S	G3	stream									Upper Terrapin	STF		P		
Strophitus subvexus	Southern creekmussel	S	G3	stream									Upper Choccolocco	SPTF				

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Strophitus subvexus	Southern creekmussel	S	G3	stream									Upper Hatchet	TF		P		S
Strophitus subvexus	Southern creekmussel	S	G3	stream									Upper Sipsey Fork	PT	SF			
Strophitus subvexus	Southern creekmussel	S	G3	stream									Lower Sipsey Fork	P	S	T		F
Strophitus subvexus	Southern creekmussel	S	G3	stream									Clear	P		TF		S
Villosa choctawensis	Choctaw bean	S	G2	stream river									North	PTF				S
Villosa choctawensis	Choctaw bean	S	G2	stream river									Five Runs	STF		P		
Villosa choctawensis	Choctaw bean	S	G2	stream river									Lower Yellow	PTF				S
Villosa choctawensis	Choctaw bean	S	G2	stream river									Blackwater_Co	SPTF				
Villosa choctawensis	Choctaw bean	S	G2	stream river									Sweetwater	PTF				S
Villosa choctawensis	Choctaw bean	S	G2	stream river									Upper Conecuh	PTF				S
Villosa choctawensis	Choctaw bean	S	G2	stream river									Lower Conecuh	PT				SF
Villosa nebulosa	Alabama rainbow	S	G3	stream				X	X				Upper Terrapin	STF		P		
Villosa nebulosa	Alabama rainbow	S	G3	stream				X	X				Hurricane	T				SP
Villosa nebulosa	Alabama rainbow			stream				X	X				Upper Choccolocco					

SCIENTIFIC NAME	COMMON NAME	Fed Status	Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Villosa nebulosa	Alabama rainbow	S	G3	stream				X	X				Upper Hatchet	TF		P		S
Villosa nebulosa	Alabama rainbow	S	G3	stream				X	X				Cahaba	PTF				S
Villosa nebulosa	Alabama rainbow	S	G3	stream				X	X				Lower Sipsey Fork	P	S	T		F
Villosa nebulosa	Alabama rainbow	S	G3	stream				X	X				Upper Brushy	PT	SF			
Villosa nebulosa	Alabama rainbow	S	G3	stream				X	X				Lower Flint			F		SPT
Villosa vanuxemensis umbrans	Coosa combshell	S	G4T4	stream									Upper Terrapin	STF		P		
Villosa vanuxemensis umbrans	Coosa combshell	S	G4T4	stream									Hurricane	T				SP
Villosa vanuxemensis umbrans	Coosa combshell	S	G4T4	stream									Middle Choccolocco	ST		PF		
Villosa vanuxemensis umbrans	Coosa combshell	S	G4T4	stream									Cahaba	PTF				S
Echinodorus parvulus	Mudbabies			pond marsh														
Hymenocallis caroliniana (coronaria)	Carolina spider lily		G2Q	stream														
Jamesianthus alabamensis	Alabama jamesianthus		G3	stream														
Jamesianthus alabamensis	Alabama jamesianthus		G3	stream														

SCIENTIFIC NAME	COMMON NAME	Fed Status	Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Jamesianthus alabamensis	Alabama jamesianthus		G3	stream														
Myriophyllum laxum	Loose watermilfoil		G3	bog		X												
Pieris phillyreifolia	Climbing fetterbush		G3	pond lake														
Pinguicula planifolia	Chapman's butterwort		G3?	pond swamp														
Alligator missisipiensis	American alligator	TA	G5	marsh lake									Yellow	STF		P		
Alligator missisipiensis	American alligator	T	G5	marsh lake									North	SPTF				
Alligator missisipiensis	American alligator	T	G5	marsh lake									Five Runs	STF		P		
Alligator missisipiensis	American alligator	T	G5	marsh lake									Lower Yellow	SPTF				
Alligator missisipiensis	American alligator	T	G5	marsh lake									Blackwater_Co	SPTF				
Alligator missisipiensis	American alligator	T	G5	marsh lake									Sweetwater	SPTF				
Alligator missisipiensis	American alligator	T	G5	marsh lake									Upper Conecuh	SPTF				
Alligator missisipiensis	American alligator	T	G5	marsh lake									Lower Conecuh	PT				SF
Alligator missisipiensis	American alligator	T	G5	marsh lake									Affonee	SPTF				
Alligator missisipiensis	American alligator	T	G5	marsh lake									Cahaba	SPTF				
Alligator missisipiensis	American alligator	T	G5	marsh lake									Little Oakmulgee	SPTF				

SCIENTIFIC NAME	COMMON NAME	Fed Status	Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Alligator missisipiensis	American alligator	T	G5	marsh lake									Uphapee	TF	S	P		
Apalone spinifera spinifera	Eastern spiny softshell		G5T5										West Flint	P		T		SF
Apalone spinifera spinifera	Eastern spiny softshell		G5T5										Town	P		F		ST
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	Yellow	TF		P		S
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	North	PTF				S
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	Five Runs	STF		P		
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	Lower Yellow	PTF				S
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	Blackwater_Co	SPTF				
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	Upper Conecuh	PTF				S
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	Lower Conecuh	PT				SF
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	Affonee	SPTF				

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	Cahaba	PTF				S
Farancia abacura	Mud snake		G5	rivers swamps oxbows								S	Little Oakmulgee	SPTF				
Farancia erytrogramma	Rainbow snake		G5	river stream spring marsh	X							S	Yellow	TF		P		S
Farancia erytrogramma	Rainbow snake		G5	river stream spring marsh	X							S	North	PTF				S
Farancia erytrogramma	Rainbow snake		G5	river stream spring marsh	X							S	Five Runs	STF		P		
Farancia erytrogramma	Rainbow snake		G5	river stream spring marsh	X							S	Lower Yellow	PTF				S
Farancia erytrogramma	Rainbow snake		G5	river stream spring marsh	X							S	Blackwater_Co	SPTF				
Farancia erytrogramma	Rainbow snake		G5	river stream spring marsh	X							S	Upper Conecuh	PTF				S

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Farancia erytrogramma	Rainbow snake		G5	river stream spring marsh	X							S	Lower Conecuh	PT				SF
Farancia erytrogramma	Rainbow snake		G5	river stream spring marsh	X							S	Chewacla	T		SPF		
Farancia erytrogramma	Rainbow snake		G5	river stream spring marsh	X							S	Uphapee	TF	S	P		
Graptemys ernsti	Escambia map turtle	S	G2	stream river	X	X			X		C	L	Yellow	TF		P		S
Graptemys ernsti	Escambia map turtle	S	G2	stream river	X	X			X		C	L	North	PTF				S
Graptemys ernsti	Escambia map turtle	S	G2	stream river	X	X			X		C	L	Five Runs	STF		P		
Graptemys ernsti	Escambia map turtle	S	G2	stream river	X	X			X		C	L	Lower Yellow	PTF				S
Graptemys ernsti	Escambia map turtle	S	G2	stream river	X	X			X		C	L	Blackwater_Co	SPTF				
Graptemys ernsti	Escambia map turtle	S	G2	stream river	X	X			X		C	L	Sweetwater	PTF				S
Graptemys ernsti	Escambia map turtle	S	G2	stream river	X	X			X		C	L	Upper Conecuh	PTF				S
Graptemys ernsti	Escambia map turtle	S	G2	stream river	X	X			X		C	L	Lower Conecuh	PT				SF
Graptemys geographica	Northern map turtle		G5	river lakes								S	Lower Sipsey Fork	P	S	T		F

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Graptemys geographica	Northern map turtle		G5	river lakes								S	Lower Brushy	P		ST	P	F
Graptemys geographica	Northern map turtle		G5	river lakes								S	Clear	P		TF		S
Graptemys geographica	Northern map turtle		G5	river lakes								S	Lewis Smith	PT				SF
Graptemys geographica	Northern map turtle		G5	river lakes								S	West Flint	P		T		SF
Graptemys geographica	Northern map turtle		G5	river lakes								S	Town	P		F		ST
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Upper Terrapin	STF		P		
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Upper Choccolocco					
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Middle Choccolocco	ST		PF		
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Cheaha	SPTF				
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Talladega	STF		P		
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Affonee	SPTF				
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Gully	SPTF				
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Cahaba	PTF				S
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Chewacla	T		SPF		

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Uphapee	TF	S	P		
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Lower Sipsey Fork	P	S	T		F
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Lower Brushy	P		ST	P	F
Graptymys pulchra	Alabama map turtle		G4	ML rivers							C	L	Clear	P		TF		S
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				North	PTF				S
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Five Runs	STF		P		
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Lower Yellow	PTF				S
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Upper Conecuh	PTF				S
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Lower Conecuh	PT				SF
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Talladega	STF		P		
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Cahaba	PTF				S

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Uphapee	TF	S	P		
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Lower Sipsey Fork	P	S	T		F
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Lower Brushy	P		ST	P	F
Macroclemys temminckii	Alligator snapping turtle	R	G3G4	swamps streams estuary		X			X				Lewis Smith	SPTF				
Sternotherus depressus	flattened musk turtle		G2	rivers	X	X		X	X				Upper Sipsey Fork	PT	SF			
Sternotherus depressus	flattened musk turtle		G2	rivers	X	X		X	X				Lower Sipsey Fork	P	S	T		F
Sternotherus depressus	flattened musk turtle		G2	rivers	X	X		X	X				Lower Brushy	P		ST	P	F
Sternotherus depressus	flattened musk turtle		G2	rivers	X	X		X	X				Clear	P		TF		S
Sternotherus depressus	flattened musk turtle		G2	rivers	X	X		X	X				Lewis Smith	PT				SF
Sternotherus minor minor	Loggerhead musk turtle		G5	river stream oxbow lake pond swamp								L	Lower Yellow	PTF				S
Sternotherus minor minor	Loggerhead musk turtle		G5	river stream oxbow lake pond swamp								L	Blackwater_Co	SPTF				

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Sternotherus minor minor	Loggerhead musk turtle		G5	river stream oxbow lake pond swamp								L	Upper Conecuh	PTF				S
Sternotherus minor minor	Loggerhead musk turtle		G5	river stream oxbow lake pond swamp								L	Lower Conecuh	PT				SF
Sternotherus minor minor	Loggerhead musk turtle		G5	river stream oxbow lake pond swamp								L	Upper Terrapin	STF		P		
Sternotherus minor minor	Loggerhead musk turtle		G5	river stream oxbow lake pond swamp								L	Upper Choccolocco					
Sternotherus minor minor	Loggerhead musk turtle		G5	river stream oxbow lake pond swamp								L	Middle Choccolocco	ST		PF		
Sternotherus minor minor	Loggerhead musk turtle		G5	river stream oxbow lake pond swamp								L	Cheaha	SPTF				
Sternotherus minor minor	Loggerhead musk turtle		G5	river stream oxbow lake pond swamp								L	Talladega	STF		P		
Thamnophis sauritus	Eastern ribbon snake		G5T5	lake pond swamp marsh									Middle Choccolocco	ST		PF		

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Thamnophis sauritus	Eastern ribbon snake		G5T5	lake pond swamp marsh									Cheaha	SPTF				
Thamnophis sauritus	Eastern ribbon snake		G5T5	lake pond swamp marsh									Talladega	ST		P		
Thamnophis sauritus	Eastern ribbon snake		G5T5	lake pond swamp marsh									Cane	SPTF				
Thamnophis sauritus	Eastern ribbon snake		G5T5	lake pond swamp marsh									Cahulga	STF		P		
Thamnophis sauritus	Eastern ribbon snake		G5T5	lake pond swamp marsh									Ketchepedrakee	STF		P		
Elimia acuta	acute elimia	R	G1	river	X	X	X						Middle Choccolocco	ST		PF		
Elimia acuta	acute elimia	R	G1	river	X	X	X						Cahaba	PTF				S
Elimia ampla	ample elimia	R	G1	river		X	X						Middle Choccolocco	ST		PF		
Elimia ampla	ample elimia	R	G1	river		X	X						Cahaba	PTF				S
Elimia annettae	Lilyshoals elimia	R	G1Q	river		X							Cahaba	PTF				S
Elimia bellula	Walnut elimia	R	G1			X							Middle Choccolocco	ST		PF		
Elimia bellula	Walnut elimia	R	G1			X							Cahaba	PTF				S
Elimia cahawbensis	Cahawba elimia	R	G3	stream		X							Cahaba	PTF				S
Elimia chiltonensis	Prune elimia	R	G1	stream		X							Upper Choccolocco	SPTF				
Elimia chiltonensis	Prune elimia	R	G1	stream		X							Upper Hatchet	TF		P		S
Elimia chiltonensis	Prune elimia	R	G1	stream		X							Weogufka	PTF				S
Elimia clara	riffle elimia	R	G3	river		X							Affonee	SPTF				

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Elimia clara	riffle elimia	R	G3	river		X							Gully	SPTF				
Elimia clara	riffle elimia	R	G3	river		X							Cahaba	PTF				S
Elimia crenatella	Lacy elimia	T	G1	stream	X				X	X			Middle Choccolocco	ST		PF		
Elimia crenatella	Lacy elimia	T	G1	stream	X				X	X			Cheaha	SPT		F		
Elimia crenatella	Lacy elimia	T	G1	stream	X				X	X			Talladega	STF		P		
Elimia crenatella	Lacy elimia	T	G1	stream	X				X	X			Tallaseehatchee_Ta	ST		PF		
Elimia crenatella	Lacy elimia	T	G1	stream	X				X	X			Cahaba	PTF				S
Elimia showalteri	Compact elimia	R	G1Q	river		X							Cahaba	PTF				S
Leptoxis taeniata	Painted rocksnail	T	G1	river	X	X		X	X	X			Middle Choccolocco					
Leptoxis taeniata	Painted rocksnail	T	G1	river	X	X		X	X	X			Cheaha	SPT		F		
Leptoxis taeniata	Painted rocksnail	T	G1	river	X	X		X	X	X			Talladega	STF		P		
Leptoxis taeniata	Painted rocksnail	T	G1	river	X	X		X	X	X			Tallaseehatchee_Ta	ST		PF		
Lepyrium showalteri	Flat pebblesnail		GH	river	X			X					Cheaha	ST				
Lepyrium showalteri	Flat pebblesnail		GH	river	X			X					Talladega	STF		P		
Lepyrium showalteri	Flat pebblesnail		GH	river	X			X					Tallaseehatchee_Ta	ST		PF		
Pleurocera annulifera	Ringed hornsnail	R	G1	river		X							Lower Sipsey Fork	P	S	T		F
Tulotoma magnifica	Tulatoma snail	E	G1	river						X			Middle Choccolocco	ST		PF		

SCIENTIFIC NAME	COMMON NAME	Fed Status	G Rank	Major Habitat	Sediment	pH	D.O.	Nutrients	Point Source	Temperature	Water Flow	Riparian	Watershed Name	Low risk factors coded 1	Mod. risk with FS 2	Mod. risk 3	High risk with FS 4	High risk 5
Tulotoma magnifica	Tulatoma snail	E	G1	river						X			Talladega	STF		P		
Tulotoma magnifica	Tulatoma snail	E	G1	river						X			Upper Hatchet	TF		P		S
Tulotoma magnifica	Tulatoma snail	E	G1	river						X			Weogufka	PTF				S

Appendix I

This appendix contains the guide for minerals operation for the NFsAL. This operations guide also contains examples of the stipulations to be used for minerals operations permits.

Minerals Operation Guide

INTRODUCTION

The purpose of this section is to describe the guidance and direction for minerals operations on the National Forests in Alabama. It is divided into two sections:

- Mineral operations clauses with attachments; and
- Leasing stipulations

MINERAL OPERATIONS CLAUSES WITH ATTACHMENTS

Conditions of approval (COA), which provide guidance and direction to minerals operators, are determined during site-specific environmental analysis. Those COAs become part of the permit and are required for mineral operations that utilize lands of the Alabama Forests. The clauses should be used for owners and operators of the private mineral estate.

The following conditions and attachments may be used in part or in their entirety, depending on the recommendations of the authorized officer following site-specific environmental analysis. They should supplement and not duplicate conditions included in the *surface use plan of operations* (SUPO) or issued lease. *These conditions should be reviewed and edited to fit each specific project.*

TERMS PERTAINING TO SURFACE USE PLAN OF OPERATIONS OR FOR MINERAL OPERATIONS PERMIT

- This permit (permit also refers to SUPO) is subject to all valid rights and claims
- In case of change of address or ownership, permittee (also includes the operator for SUPO) shall immediately notify the district ranger.
- The permittee shall comply with all applicable federal, state, and local laws, regulations, and standards and other relevant environmental laws, as well as public health and safety laws.

- The permittee shall maintain the improvements and permit area to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the authorized officer and consistent with other provisions of this authorization. If requested, the holder shall comply with inspection requirements deemed appropriate by the authorized officer.

- The permittee has a continuing responsibility to identify all hazardous conditions on the permit area that would affect the improvements, resources, or pose a risk of injury to individuals. Any non-emergency actions to abate such hazards shall be performed after consultation with the authorized officer. In emergencies, the permittee shall notify the authorized officer of its actions as soon as possible, but not more than 48 hours, after such actions have been taken.

- The permittee shall be responsible for the prevention and control of soil erosion or other resource damage on the area covered by this permit and lands adjacent thereto, and shall provide preventive measures as required by specifications attached to and made part of this permit.

- No waste or by-products shall be discharged containing any substances in concentrations, which may result in significant harm to fish and wildlife, or to human water supplies. Storage facilities for materials capable of causing water pollution, if accidentally discharged, shall be located to prevent any spillage into waters, or to channels leading into water, that would result in significant harm to fish and wildlife or to human water supplies.

- The permittee shall protect the scenic esthetic values of the area under this permit, and the adjacent land, associated with the authorized use, during construction, operation, and maintenance of the improvements.

- All access roads will be built on locations and to specifications approved in advance of construction by the forest officer in charge.

- The authorized operation may be temporarily suspended due to excessively wet soil conditions when unacceptable resource damage is anticipated or occurring as determined by the authorized officer.

- No member or delegate of Congress shall be admitted to any share or part of this agreement or to any benefit that may arise here from unless it is made with a corporation for its general benefit. This does not apply to outstanding minerals.

- The permittee shall fully and currently repair all damage other than ordinary wear and tear to national forest roads and trails caused by the permittee in the exercise of the privilege granted by this permit.

- Pipeline rights-of-way will be authorized by a special-use-permit. Conditions of use, including restoration and abandonment, will be included in the permit. There will be no charge for occupancy on the leasehold interest.

- The Heritage resource report and (state) SHPO concurrence are on file; however, prior to or during excavation work, items of archeological, paleontological, or historic value are reported or discovered, or an unknown deposit of such items is disturbed, the permittee will immediately cease excavation in the area so affected. The holder will then notify the Forest Service and will not resume work until the authorized officer gives written approval.

ATTACHMENT #1

Resource protection plan for oil and gas drilling, production, and storage sites

The permittee or an authorized representative of the permittee will:

- Immediately after site construction and as needed throughout the life of the authorization, install or construct erosion devices where appropriate. Also, revegetate those disturbed areas that will not sustain traffic (see also attachment #3). The following will be accomplished as directed by the overseeing forest officer:
  - Sediment dams in gullies, etc.
  - Contour terraces on areas that exceed three percent gradient.
  - Diversion terraces if the potential exists for heavy water flow onto or across the site.
  - Erosion control blankets on all cut or fill slopes that cannot be shaped to a 3:1 gradient or less.
  - Fences around treated areas on sensitive soils until new vegetation is firmly established.

- Locate the well site on the most level upland location that will accommodate the intended use; away from drainages and riparian areas. Site layout will be oriented to conform to the best topographic situation given the geologic target and any safety considerations. The site will be staked and reviewed to determine its compliance with environmental analysis documentation. Any timber cuttings will be done in accordance with and under the direction of the district ranger.

- Prior to drilling associated water well(s), the operator will provide the district ranger with the appropriate approved state permits authorizing such a well(s).

- Notify the district ranger at least five working days in advance of all work, which will result in surface disturbance for a pre-drill inspection.

- Obtain the district ranger's approval for any changes in a permitted site plan, which would result in additional surface disturbance.

- Notify any subcontractors of required permits for activity not covered under the terms and conditions of this permit.

- Confine all surface disturbing activities to the project areas as shown on the site plans and designated on the ground.

- Fencing the entire drilling site will be required. The permittee may choose the type of fencing, but the forest officer must approve the design and material. Fencing will be done as soon as site preparation is completed (trees removed), and will remain in place until pits are constructed and reclamation is completed in compliance with the restoration plan.

- As specified in attachment #3, stockpile the surface soil from the entire area to be disturbed in approved locations. In addition, soil stockpiles should be leveled or rounded on top, and smoothed on the sides to 3:1 slope and vegetated as specified.

- Brush, slash, and other debris may be burned if authorized by forest officer, or otherwise will be disposed of as directed. See attachment #6. Burning will follow all applicable Forest Service, Alabama Office of Forestry, and State of Alabama air quality regulations and procedures. See attachment #7. Stumps and woody material will not be buried in pits or fill areas.

- Prior to the commencement of the drilling operations, the authorized officer must approve the method of disposal of the drilling fluids and cuttings.

- Construct mud pits so that they will not leak, break, or allow any discharge of liquids. The need for lining production pits and other types of pits with either an impervious clay material or an artificial liner will be determined by the forest officer. If a liner is required, it will be installed along the bottom and sides of pits and be equivalent to 3 continuous feet of recompacted or natural clay having a hydraulic conductivity no greater than 1 x 10-7cm / sec. Such liners include:

    - Natural liner
    - Soil mixture liner
    - Recomputed clay liner
    - Manufactured liners
    - Combination liners

- Minimum specifications for an artificial pit liner are: tensile grab strength warp) of 150 pounds and mullen burst strength of 300 pounds. All seams must be heat-treated.

- Pits are not to be located in stream channels. At least 50 percent of the pit should be constructed in an excavation (cut) of the pad site. Pit walls shall be smoothed and keyed. Side slopes shall not exceed 3:1. Outside pit walls shall be vegetated.

- A central collection tank made of impervious material will be located in an area to catch contaminants before overflow. This collection tank will be pumped routinely to prevent overflow.

- Protect pits from surface waters by levees or walls and by drainage ditches, where needed, and no siphons or openings will be placed in or over levees or walls that would permit escaping of contents so as to cause pollution or contamination.

- After drilling operations cease: The disposal of fluids and cuttings will be accomplished within 30 days of completion of the drilling operations.

- Materials may be pumped back down hole only after proper approval from the Alabama Oil and Gas Board, or Bureau of Land Management (BLM), as applicable, has been presented to the Forest Service. Pit sludge and cuttings may be buried on site in the existing pit only if an independent laboratory has tested the material and provided the Forest Service with proof that all Federal and State waste disposal requirements are met. If burial is allowed, only existing pits may be utilized. If burial is not allowed, all drilling sludge and cuttings will be removed and appropriately disposed of. If man-made pit liners are used, they will be removed from the pit and disposed of off national forest.

- Pits will be backfilled when dry, and site smoothed and recontoured as near as practicable to the original topography, with stockpiled topsoil respread evenly. Pits will remain fenced until backfilled unless fencing is needed to protect from cattle or off-road vehicle use. The authorized officer will notify the operator when fencing may be removed, usually after two growing seasons or when 70 percent coverage is achieved, as per attachment #3.

- Follow these sanitation guidelines:

    - All litter and garbage deposited on and off the site because of this project will be kept in a container and disposed of as necessary.

    - Portable toilets will be used, and waste will be hauled to an approved disposal facility.

    - In lieu of portables, flush toilets such as those in trailers used for office space or crew quarters may be used when connected to a closed sewage system. Tanks will be pumped prior to reaching system capacity. Wastes will be hauled to an approved disposal facility.

- Coordinate the proposed site surfacing (boards or gravel) with the forest officer in the planning phase. No changes should be made without approval of the forest officer.

- Remove all surfacing material (gravel) from the areas not needed for production operations; revegetate those areas according to attachment #3. This will be done within 30 days unless directed by the forest officer.

- Within 90 days of termination of oil or gas production, or plugging of the well, remove the wellhead control device and appurtenances, unless permittee has approval from the BLM not to remove them. Remove gravel or other surfacing, recontour the site, and revegetate according to attachment #3.

ATTACHMENT #2

Road and pad management

Permittees agree to the following provisions:

- Construction and surfacing requirements for road access to the project areas, as stated in the specifications of the environmental assessment, shown as typical section drawings.

- Roads and pads will be adequately maintained during the life of the authorization. This maintenance shall include blading and shaping to smooth surfaces and pull surfacing material back onto roadway, resurfacing, spot graveling, ditch work, and culvert repair or additional work as specified. This work shall be conducted as needed or as directed by the forest officer.

- Except for the driving surface, the road right-of-way will be revegetated according to attachment #3.

- The road may be left and maintained for the operation of a producing well or for the use of the Forest Service at the district ranger's discretion.

- Upon termination of operations, if the district ranger wants the road closed, the permittee or his authorized representative will:

  - Remove all surfacing, bridging, and water-handling materials and unless otherwise authorized by the district ranger, remove from national forest land.

  - Recontour the abandoned roadway as nearly as practical to original condition.

  - Revegetate the abandoned roadway according to attachment #3.

- Use of roads other than those constructed by the permittee may be subject to additional requirements. Inquiry will be made to the forest officer prior to use of preexisting roads.

ATTACHMENT #3

Restoration of disturbed areas

The permittee agrees to the following provisions:

A permanent vegetation cover will be established on all disturbed areas where bare mineral soil is exposed. The following are procedures recommended and commonly used to accomplish this reclamation.

Except for those areas needed for access and/or production, areas where soil has been disturbed shall not ordinarily be left unseeded for more than 30 days. If it is anticipated the area will be left exposed for a longer period, seeding should occur immediately (before 30 days have elapsed). Seeding includes cut and fill slopes, all ditches, shoulders, and any other areas exposed by the project. Sites such as pit walls and topsoil stockpiles, that will be exposed only one fall growing season will be seeded to a rye grass and wheat mixture at the rates shown below under *seed species, rate, and season*.

- *Stockpile so*il - During initial clearing for the project, the topsoil (to a depth determined by the forest officer at the pre-drill meeting) from the site will be removed and stockpiled for later use in restoration. Remove woody material prior to stockpiling soil. See attachment #1 for additional instructions.

- *Waterbars and terraces* - During occupancy and restoration, slopes or gradients 3 percent or greater will require waterbars and/or terraces to be constructed and maintained. The forest officer will instruct where these structures will be placed.

- *Baled hay and silt fence for erosion control* - Temporary erosion, and sediment and water pollution control measures will be required as described in the attached specifications.

- *Seedbed preparation* -After returning the site to its original contour and forming any needed terraces, spread stock piled soil evenly over the site, till the surface to produce about 2 to 5 inches of loose soil, fertilize as in item 5 below, and sow the recommended seed mixture on the freshly prepared soil bed. Rip subsoil on pads and roads prior to spreading topsoil as directed by the Forest Officer.

- *Fertilization rates* - Fertilize all disturbed areas at the following rate: 13-13-13 complete fertilizer, to be applied uniformly at 500 pounds per acre.

- *Seed species, rate, and seasons* – Use mixtures of at least two grasses and one legume. Heavier rates can be used. It is always cheaper to plant more seed than to have to replant. These are minimum rates. In case of seeding failure, the permittee will reseed following the same recommendations. The following seed mixtures are recommendations. Changes must be approved by Forest Service watershed personnel.

March 1 - June 30:
Hulled Bermuda, 40 lbs/acre
Pensacola Bahia, 10 lbs/acre
Kobe Lespedeza, 10 lbs/acre

July 1- August 31:
Hulled Bermuda, 35 lbs/acre
Pensacola Bahia, 10 lbs/acre
Brown top millet, 10 lbs/acre

September 1 -January 31:
Unhulled Bermuda, 30 lbs/acre
Pensacola Bahia, 10 lbs/acre
Subterranean clover, 25 lbs/acre

Annuals -
Rye grass, 20 lbs/acre or
Winter wheat, 20 lbs/acre
Crimson clover, 10 lbs/acre

And, yearlong, a minimum of two of the following native species:
Little bluestem, 8 lbs/acre
Big bluestem, 8 lbs/acre
Switch grass, 8 lbs/acre
Partridge pea, 10 lbs/acre

- *Harrowing* – After fertilizing and seeding as recommended above, drag-harrow lightly, taking care not to cover seed too deeply. About 1/4 inch of soil should cover the seed. Seeding must be repeated, if necessary, until success in establishing cover is achieved.

- *Mulching* -The use of hay, straw, or commercial mulch will be necessary when slopes exceed 3 percent. These areas should be covered with 1-1/2 to 2-1/2 tons per acre of mulch. Mulch will be applied to the entire area during periods of drought (normally June 15 - Oct. 1). Mulch should be tied down with woven nets, asphalt tackifier, synthetics, or disked lightly into the soil. Erosion control blankets will be used on cut or fill slopes, which cannot be shaped to a 3:1 gradient or less. The utilization of appropriate machinery usually results in considerable savings and produces a more uniform job.

- Reclamation may be approved not earlier than one year following the successful establishment of vegetative cover. Vegetative cover over at least 70 percent of the entire disturbed area will be considered successful establishment if no gullies or other erosion-related problems exist. All drilling/production related equipment or rubbish must be removed prior to Forest Service acceptance of the site as restored.

- The permittee is responsible for successful restoration regardless of weather or other natural factors.

- Performance Bonds (if applicable) will not be released until satisfactory reclamation is complete.

ATTACHMENT #4

Reports

The permittee agrees to the following provisions:

- Upon completion of pit/pipeline closure testing, permittee will send the district ranger copies of test results required by the Alabama Department of Environmental Management.

- A copy of any or all permits required by the Alabama Department of Environmental Management and the Bureau of Land Management will be given to the district ranger.

- Produced water disposal information shall be provided to the district ranger. This information will include disposal location, route, and amount of water disposal traffic on national forest roads or lands. The permittee shall provide a spill prevention control and countermeasure plan or similar document, which conforms to the requirements of 40 CFR 112.

ATTACHMENT #5

Standards for oil and gas production facilities on the National Forests in Alabama

The permittee agrees to the following:

- Petroleum product and water storage tanks will be placed on level ground and surrounded by a dike capable of holding 1-1/2 times the volume of the largest tank. A sump shall be installed inside the dike and routinely pumped to prevent overflow.

- Tanks will be placed on a stable, solid foundation six inches or more in height to ensure that they remain clear of standing water. The foundation will be designed so that it will not subside and cause the tanks to sink or lean. Trenching within diked areas will not be allowed.

- Dikes will not be dug from a level surface. Instead, a level surface will be used as a base with the dike built upon that. The dike core will be of clay or other similarly impermeable material. The top of the dike will be level and maintained so that it does not become beaten down at any point. The top of the dike should be a minimum of 18 inches in width and side slopes of no greater than 3:1. It is recommended that the sides and top of all dikes be covered with a thick plastic sheet and washed gravel on top of the plastic. This will help prevent erosion and sloughing of dike material. This will also help solve the problem of vegetation growth and fire hazards; spraying or mowing should not be necessary. Dikes must be constructed before any liquid is stored in the tanks.

- Any liquids collected within dikes, including liquids that may be rainwater, will not be drained off the site (outside dike area). Drains will not be installed. Liquids will be removed by vacuum truck to an approved disposal or injection facility.

- All lines used to drain oil or salt water will have well-maintained and sealed valves to prevent leaks and vandalism. Load-out valves shall be located within dike area.

- Only that amount of the site that is needed to contain production facilities, a reasonable adjacent work area, and the access road will be occupied. The remaining authorized area will be restored as per attachment #3. Guy wires left on site for work-over rigging will be well marked.

- A fence is required to exclude casual foot traffic and cattle. It will enclose all surface production equipment. The forest officer will approve its location. Construction standards will be to specifications supplied by the forest officer. These specifications, as a minimum, include safety signs and fencing. Forest Service requirements for signing gates will be met.

- On-site equipment will be kept well maintained, neatly arranged, and painted where appropriate. It is the intent that a neat, orderly appearance is presented. Facilities will be painted to blend into the surrounding environment; the authorized forest officer will determine specific painting requirements.

- Pesticides, including herbicides, may not be used to control undesirable woody and herbaceous vegetation, aquatic plants, insects, rodents, or trash fish without prior written approval of the forest officer. A request for approval of planned uses and schedule of applications of pesticides will be submitted annually by the permittee. Exceptions to this schedule may be allowed only when unexpected outbreaks of pest require control measures which were not anticipated at the time the annual report was submitted/required. At that time, an emergency request and approval may be made.

  Only those materials registered by the U.S. Environmental Protection Agency for the specific purpose planned will be considered for use on national forest land. Label instructions will be strictly followed in the application of pesticides and disposal of excess materials and containers.

- Any chemicals stored on-site will have prominent labeling and stored off the ground out of direct sunlight.

- As required by on-site conditions, measures will be taken to prevent soil erosion. Erosion control specifications are shown in attachment #3.

- Site access roads will be gated only upon the approval of the Forest Officer. The Forest Officer must also approve gate specifications. Gates shall be signed and comply with the Manual of Uniform Traffic Control Devices (MUTCD).

- Signs restricting public access will be placed only with the approval of the district ranger. All signs will be removed by the permittee at the conclusion of operations.

- Upon a spill occurrence, the permittee shall take immediate containment and cleanup action and notify the forest officer at the earliest opportunity, not more than 48 hours. The plan shall include all pipelines.

- Upon plugging and abandonment of the well bore, the casing will be cut off below ground level as per LDOC and BLM specifications.

- All nonessential equipment for the production facility will be removed from national forest land within 30 days of being excess.

ATTACHMENT #6

Threatened and endangered species management and protection

If the facility authorized by this permit is, or later may be found to be, within ¼-mile of a red-cockaded woodpecker (RCW) cluster site or recruitment stand, then by acceptance of this permit the permittee agrees to cut no trees for maintenance or improvement without the specific advance authorization of the forest officer. In cases where proposed cutting of the trees may conflict with the Final Environmental Impact Statement for the Management of the Red-Cockaded Woodpecker and Its Habitat in the Southern Region, or a plan for RCW management and recovery, the forest officer may deny the request to cut trees.

The permittee may be required to trench, bore, or directionally drill pipelines under or near RCW cavity trees and/or within RCW cluster sites to prevent or minimize damage to the root systems of cavity trees when laying pipelines on a case-by-case basis, as deemed appropriate by the forest officer, with U.S. Fish & Wildlife Service concurrence.

The permittee agrees to the following for impacts within the habitat management area (HMA) for the red-cockaded woodpecker (RCW):

Note - Use only the provisions that apply to the project.

- For every well site constructed within 1.5 miles of an active RCW cluster site in current suitable habitat of 25 years or older pine or pine/hardwood, the permittee shall provide for 3 improved (10 acres of hardwood understory and midstory removal and 4 artificial cavity inserts each) recruitment stands or cluster sites, of suitable habitat, at location determined by the Forest Service.

- For every well site within 1.5 miles of an active RCW cluster site in 0-25 year-old pine or pine/hardwood, the permittee shall provide for 1 improved site (10 acres midstory removal and 4 inserts).

- For every well site constructed beyond 1.5 miles from an active RCW cluster site with suitable habitat, the permittee shall provide for 1 improved recruitment stand or cluster site at a location determined by the Forest Service.

- For every 5 acres of pine or pine/hardwood of suitable habitat removed for production facilities within 1.5 miles of an active RCW cluster site of suitable habitat, the permittee shall provide for 3 improved recruitment stands or cluster sites at locations determined by the Forest Service.

- For every 5 acres of pine or pine/hardwoods of suitable habitat, removed for production facilities outside 1.5 miles of an active RCW cluster site, the permittee shall provide for 1 improved recruitment stand or cluster site at location determined by the Forest Service.

- For every 5 acres of suitable pine or pine/hardwood habitat removed for pipelines or transmission lines within an HMA, a permittee shall provide for 1 improved recruitment stand or cluster site at location determined by the Forest Service.

- For every active cluster site in which drilling activity vehicles will have to travel through during nesting season (March 1 through July 31), 4 artificial cavity inserts away from the road shall be provided for by the permittee.

- Three times annually, permittee shall provide for monitoring of all active sites within ½-mile of drilling activities, and monitoring of all sites improved by permittee funding. This will be done during nesting season (mid-April through mid-June), fall (Sept. through Nov.), and late winter (Feb. through March); and will begin on active sites during the monitoring period following drilling activity. On improved sites, it will begin during the monitoring period following improvement of the sites. Monitoring will continue on all sites for three years following completion of construction. The permittee shall provide annual monitoring results to the Forest Service.

- If well sites are located within ¼-mile of an active cluster site, the permittee shall provide for augmentation of 3 improved sites with a pair of RCWs (male and female).

- It is the responsibility of the permittee to provide for the establishment of these improved sites within 30 days following initiation of site construction. This can be accomplished by permittee providing cooperative funds to the Forest Service to accomplish the work, or by permittee accomplishing improvement work. If permittee performs work, the Forest Service will provide permittee with improvement location within 30 days of construction initiation, and improvement work will begin 30 days following Forest Service providing improvement locations. Work will meet Forest Service specifications.

- The Forest Service will have the option to request funding for dormant season burning and/or growing season burning to improve habitat for the RCW in lieu of improved or augmented sites. With this option, the permittee shall provide funding for 250 acres of dormant season burning or 50 acres of growing season burning for every improved site required.

ATTACHMENT #7

Fire protection or other hazard plan

The permittee agrees to the following provisions:

- Obtain District Ranger's permission prior to any burning activity.
- Comply with State of Alabama fire laws.
- All vehicles used on the construction sites will be equipped with a fire extinguisher.
- All gasoline- and diesel-powered equipment must have Forest Service approved spark arrestors/mufflers.
- Take all reasonable action to prevent and suppress forest fires and require all employees to do likewise.
- Pay for the cost of suppressing forest fires and damages to government property caused by fires resulting from acts of the permittee, his subcontractors, operators, or his employees.
- Notify the district ranger in case of fire and take immediate action to control the fire. The district ranger will provide the permittee with phone numbers where fires shall be reported.
- It is the permittee's responsibility to notify the district ranger when flaring of the formation gas is to begin. Prior to flaring, the permittee must have approval from the State or BLM, as appropriate.
- Maintain a fuel break by mowing around all production equipment to reduce fire danger during the months from May through September.
- A list of chemicals (including MSOS sheets) on site will be provided to the district ranger's office for emergency response planning.

ATTACHMENT #8

Conditions of use for pipeline authorization, operation, maintenance, and abandonment

Use this attachment only when the pipelines are being authorized as part of the APD.

- Liability - The holder shall be liable for all injury, loss, or damage, indirectly or directly resulting from or caused by the holder's use and occupancy of the area covered by this authorization, regardless of whether the holder is negligent, provided that the maximum liability without fault shall not exceed $1 million for any one occurrence. Payment of damages for occurrence where there is liability without fault (strict liability) does not limit the holder's liability for damages in excess of $1 million where actual negligence is shown or imputed. The laws governing ordinary negligence shall determine liability for injury, loss, or damage in excess of the specified maximum.

- Indemnification - The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of national forest lands under this permit.

- Risks and hazards - Avalanches, rising waters, high winds, falling limbs or trees, and other hazards are natural phenomena in the Forest that present risks, which the holder assumes. The holder has responsibility of inspecting the site, lot, right-of-way, and immediate adjoining area for dangerous trees, hanging limbs, and other evidence of hazardous conditions and, after securing permission from the Forest Service, of removing such hazards.

- Construction safety - The holder shall carry on all operations in a skillful manner, having due regard for the safety of employees; and shall safeguard with fences, barriers, fills, covers, or other effective devices, pits, cuts, and other excavations which otherwise would unduly imperil the life, safety, or property of other persons.

- Width of ROW - The width of the right-of-way is limited to (to be determined) feet, plus the ground occupied by the pipeline.

- Standards and practices - All designs, materials, and construction, operation, maintenance, and termination practices employed in connection with this use shall be in accordance with safe and proven engineering practices and shall meet or exceed the following standards:

  1) U.S.A. Standard Code for Pressure Piping, ANSI B 31.4, "Liquid Petroleum Transportation Piping System".[1/]

2) Department of Transportation Regulations, 49 CFR, Part 195, "Transportation of Hazardous Liquids by Pipeline".1/

3) Department of Transportation Regulations, 49 CFR, Part 192, "Transportation of Natural and Other Gas by Pipelines: Minimum Federal Safety Standards".2/

1/Not applicable to gas pipelines.
2/ Not applicable to oil pipelines.

- Oil, gas & related material pipeline standards - Related mechanical facilities such as pumps, pump stations, and tanks shall be designed, constructed, operated and maintained in accordance with safe and proven engineering practice, and meet or exceed recognized engineering standards for the type of facility.

- Survey, land corners - The holder shall protect, in place, all public land survey monuments, private property corners, and Forest boundary markers. In the event that any such land markers or monuments are destroyed in the exercise of the privileges authorized by this permit, depending on the type of monument destroyed, the holder shall see that they are reestablished or referenced in accordance with (1) the procedures outlined in the Manual of Instructions for the Survey of the Public Land of the United States, (2) the specifications of the county surveyor, or (3) the specifications of the Forest Service.

  Further, the holder shall cause such official survey records as are affected to be amended as provided by law. Nothing in this clause shall relieve the holder's liability for the willful destruction or modification of any Government survey marker as provided at 18 U.S.C. 1858.

- Pipeline drilling and boring – Pipelines will be drilled or bored from a distance of at least 33 feet from the stream channel, and exit at least 33 feet from the opposite side of the channel. The pipeline will be installed at least 5 feet beneath the channel bottom. The Forest Service will determine whether the drilling or boring method will be used. If water is not flowing in the stream channel during the time of construction, the Forest Service may authorize installation of the pipeline by trenching. The agency considers any natural drainage with a defined scour channel to be a stream. All streams are to be protected by a streamside habitat management zone, which extends at least 50 to 150 feet on either side of the stream channel. Any clearing or soil disturbance within the streamside habitat management zone will be kept to the absolute minimum necessary to install the pipeline. No clearing or soil disturbance within the streamside habitat management zone will be allowed within 33 feet of either side of the channel when boring or drilling is employed to install the pipeline.

- Revegetation, surface restoration of ground cover - The holder shall be responsible for the prevention and control of soil erosion and gulling on lands covered by this permit and adjacent thereto, resulting from construction, operation, maintenance, and termination of the permitted use. Holder shall so construct permitted improvements to avoid the accumulation of excessive heads of water and to avoid encroachment on streams. Holder shall revegetate or otherwise stabilize all ground where the soil has been exposed and shall construct and maintain necessary preventive measures to supplement the vegetation as indicated in Attachment #3 and as directed by the Forest Service.

- Pesticide use - Pesticides may not be used to control undesirable woody and herbaceous vegetation, aquatic plants, insects, rodents, trash fish, etc., without the prior written approval of the Forest Service. A request for approval of planned uses of pesticides will be submitted annually by the holder on the due date established by the authorized officer. The report will cover a 12-month period of planned use beginning 3 months after the reporting date. Information essential for review will be provided in the form specified. Exceptions to this schedule may be allowed, subject to emergency request and approval, only when unexpected outbreaks of pests require control measures which were not anticipated at the time the annual report was submitted.

  Only those materials registered by the U. S. Environmental Protection Agency for the specific purpose planned will be considered for use on national forest lands. Label instructions will be strictly followed in the application of pesticides and disposal of excess materials and containers.

- Subsistence, local residents - The holder shall use care not to damage any fish, wildlife, or biotic resources in the general area of the right-of-way upon which persons living in the area rely for subsistence purposes; and the holder will comply promptly with all requirements and orders of the authorized officer to protect the interests of such persons.

- Resource management plan - The holder shall join the Forest Service in preparing a resource management plan, which will be attached hereto and made a part hereof. Holder agrees to perform all of the acts and practices of land management specified therein. The aforesaid plan shall be reviewed periodically, as determined by the authorized officer.

- Crude oil pipelines - Any domestically produced crude oil transported by the permitted pipeline, except such crude oil which is either exchanged in similar quantity for convenience or increased efficiency of transportation with persons or the government of an adjacent foreign state, or which is temporarily exported for convenience or increased efficiency of transportation across parts of an adjacent foreign state and reenters the

United States, shall be subject to all of the limitations and licensing requirements of the Export Administration Act of 1969 (Act of December 30, 1969; 83 Stat. 841) and, in addition, before any crude oil subject to this section may be exported under the limitation and licensing requirements, and penalty and enforcement provisions of the Export Administration Act, the President must make and publish and express finding that such exports will not diminish the total quantity or quality of petroleum available to the United States and are in the national interest and are in accord with the provisions of the Export Administration Act.

- Common-carrier operation – Pipelines and related facilities authorized herein, shall be constructed, operated, and maintained as common carriers. The holder shall accept, convey, transport, or purchase without discrimination, all oil or gas delivered to the pipeline without regard to whether the oil or gas was produced from federal lands or non-federal lands. In the case of oil or gas produced from federal lands or from resources on the federal lands in the vicinity of the pipeline. The Secretary of the Interior may, after a full hearing with due notice thereof to the interested parties and a proper finding of facts, determine the proportionate amounts to be accepted, conveyed, transported, or purchased. Provided, that this stipulation shall not apply to any natural gas pipeline operated by any person subject to regulation under the Natural Gas Act or by any public utility subject to regulation by a state or municipal regulatory agency having jurisdiction to regulate the rates and charges for the sale of natural gas to consumers within the state or municipality. Where natural gas is not subject to State regulatory or conservation laws governing its purchase by pipelines is offered for, each such pipeline shall purchase without discrimination, any such natural gas produced in the vicinity of the pipeline.

- Implied permission - Nothing in this permit shall be construed to imply permission to build or maintain any structure not specifically named on the face of this permit, or approved by the authorized officer in the form of a new permit or permit amendment.

- Area access - The holder agrees to permit the free and unrestricted access to and upon the premises at all times for all lawful and proper purposes not inconsistent with the intent of the permit or with the reasonable exercise and enjoyment by the holder of the privileges thereof.

- Improvement relocation - This permit is granted with the express understanding that should future location of United States Government improvements or road rights-of-way require the relocation of the holder's improvements, such relocation will be done by, and at the expense of, the holder within a reasonable time as specified by the authorized officer.

Note: Use only one X-45 or X-46 either/or RBX-46.

- Partnership representative – (X-45) The holder shall furnish the authorized officer:
  - A copy of the articles of a resolution of the partners specifically authorizing one or more of the partners to represent the permit holder in dealings with the Forest Service if not specified in the articles or partnership.
  - A list containing the name and address of each partner.
- Corporation status notification - (X-46) the following condition shall be included in all special-use authorizations issued to corporations.
  - The holder shall notify the authorized officer within 15 days of the following changes:
    - Names of officers appointed or terminated.
    - Names of stockholders who acquire stock shares causing their ownership to exceed 50 percent of shares issued or who otherwise acquire controlling interest in the corporation.
  - The holder shall furnish the authorized officer:
    - A copy of the articles of incorporation and bylaws.
    - An authenticated copy of a resolution of the board of directors specifically authorizing a certain individual or individuals to represent the holder in dealing with the Forest Service.
    - A list of officers and directors of the corporation and their addresses.
  - The corporation will also furnish the authorized officer with names and addresses of shareholders owning three percent or more of the shares, and number and percentage of any class of voting shares of the entity, which such shareholder is authorized to vote. (36 CFR 251.54 (e)(1)(IV)).
  - The authorized officer may, when necessary, require the holder to furnish additional information as set forth in 36 CFR 251.54 (e)(1)(iv).
- Corporate status notification - (R8 X-46) Holder shall provide sufficient information so that the authorized officer will know the true identity of the corporation. Upon request by the authorized officer, the Holder will furnish additional information as set forth under 36 CFR 251.54 (e)(I)(IV). A

certified copy of either the minutes of the board, or the pertinent excerpts from the corporate resolutions authorizing the corporate official designated to handle its affairs with the Forest Service will be furnished the authorized officer.

- Nonexclusive use - This permit is not exclusive; that is, the Forest Service reserves the right to use or permit others to use any part of the permitted area for any purpose, provided such use does not interfere with the rights and privileges hereby authorized.

- Disputes - Appeal of any provisions of this authorization or any requirements thereof shall be subject to the appeal regulations at 36 CFR 251, Subpart c (54 FR 3362, January 23, 1989), or revisions thereto.

- Protection of road facilities – Authorized improvements shall be placed no closer than 10 feet from an existing road structure (bridge, culvert, etc.) or buried at a sufficient depth, so as not to interfere with the replacement and/or maintenance of said structure.

- Environmental standards - Holder shall conduct all activities associated with the pipeline in a manner that will avoid or minimize degradation of air, land, and water quality. In the construction, operation, maintenance, and termination of the pipeline, holder shall perform its activities in accordance with applicable air and water quality standards, related facility siting standards, and related plans of implementation, including but not limited to, standards adopted pursuant to the Clean Air Act, as amended (42 USC 1857) and the Federal Water Pollution Control Act, as amended (33 USC 1321).

- Purge and test all associated pipelines along with the closure of the well site. Testing requirements of the associated pipelines will be required to meet the same stated above, in crude oil pipelines (section 129.B.6.c.1-5.LOC). Copies of test results are to be presented to the Forest Service as proof that all federal and state waste disposal requirements are met. The forest officer will determine if the lines will be allowed to remain buried as a disposal method.

LEASING STIPULATIONS

The leasing stipulations and lease notices used consistently on the National Forests in Alabama are illustrated in the following exhibits.

EXHIBIT 1: NOTICE TO LESSEE

Provisions of the Mineral Leasing Act (MLA) of 1920, as amended by the Federal Coal Leasing Amendments of 1976, affect an entity's qualifications to obtain an oil and gas lease. Sections 2(a)(2)(A) of the MLA, 30 U.S.C. 201 (a)(2)(A), requires that any entity that holds and has held a federal coal lease for 10 years beginning on or after August 4, 1976, and who is not producing coal in commercial quantities from each such lease, cannot qualify for the issuance of any other mineral lease granted under the MLA. Compliance by coal lessees with Section 2(a)(2)(A) is explained in 43CFR3472.

In accordance with the terms of this oil and gas lease with respect to compliance by the initial lessee with qualifications concerning federal coal lease holdings, all assignees and transferees are hereby notified that this oil and gas lease is subject cancellation if: (1) the initial lessee as assignor or as transferor has falsely certified compliance with Section 2(a)(2)(A), or (2) because of a denial or disapproval by a State Office of a pending coal action, i.e., arms-length assignment, relinquishment, or logical mining unit, the initial lessee as assignor or as transferor is no longer in compliance with Section 2(a)(2)(A). The assignee, sublessee, or transferee does not qualify as a bona fide purchaser and, thus, has no rights to bona fide purchaser protection in the event of cancellation of this lease due to noncompliance with Section 2(a)(2)(A).

Information regarding assignor, sublessor, or transferor compliance with Section 2(a)(2)(A) is contained in the lease case file as well as in other Bureau of Land Management records available through the state office issuing this lease.

EXHIBIT 2: STIPULATION FOR LANDS OF THE NATIONAL FOREST SYSTEM UNDER THE JURISDICTION OF DEPARTMENT OF AGRICULTURE

The licensee/permittee must comply with all the rules and regulations of the Secretary of Agriculture set forth at Title 36, Chapter 11, of the Code of Federal Regulations governing the use and management of the National Forest System (NFS) when not inconsistent with the rights granted by the Secretary of Interior in the license/prospecting permit/lease. The Secretary of Agriculture's rules and regulations must be complied with for (1) all use and occupancy of the NFS prior to approval of a permit/operation plan by the Secretary of the Interior, (2) uses of all existing improvements, such as forest development roads, within and outside the area licensed, permitted or leased by the Secretary of the Interior, and (3) use and occupancy of the NFS not authorized by a permit/operation plan approved by the Secretary of the Interior.

All matters related to this stipulation are to be addressed to:

Forest Supervisor
National Forests in Alabama
2946 Chestnut Street
Montgomery, AL 36107

Telephone: (334) 832-4470

who is the authorized representative of the Secretary of Agriculture.

<u>BLM District Office</u>:

USDI, Bureau of Land Management
Jackson District Office Room 792S
411 Briarwood Drive, Suite 404
Jackson, MS 39213

<u>Surface Management Agency</u>:

USDA, Forest Service -Region 8
Lands and Minerals
1720 Peachtree Street, NW
Atlanta, GA 30367

EXHIBIT 3

NO SURFACE OCCUPANCY STIPULATION

NATIONAL FORESTS IN ALABAMA
STIPULATION #

Serial No.

NO SURFACE OCCUPANCY STIPULATION

Legal Description of Lands Covered by Stipulation

For the purpose of:

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820,)

EXHIBIT 4

CONTROLLED SURFACE USE STIPULATION

NATIONAL FORESTS IN ALABAMA
STIPULATION #

Serial No.

CONTROLLED SURFACE USE STIPULATION

Surface occupancy or use is subject to the following operating constraints.

(Legal description of lands covered by stipulations.)

For the purpose of:

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes, (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Serial No.________________________

EXHIBIT 5, LEASE NOTICE #3

All or part of the leased lands may contain animal or plant species classified under the Endangered Species Act of 1973, as amended. Other species may have identified as sensitive in accordance with Forest Service Manual 2670 and be listed on the current Regional Forester's list of sensitive plant and animal species. Further information concerning the classification of these species may be obtained from the authorized forest officer.

Exploration and development proposals may be limited or modifications required if activity is planned within the boundaries of a threatened, endangered or sensitive plant or animal species location as it then exists. All activities within these areas must be conducted in accordance with existing laws, regulations and the Forest Land and Resource Management Plan guidelines.

All available land in (legal description of land).

Serial No. ______________________

EXHIBIT 6, LEASE NOTICE #4

All or part of the leased lands may be classified as wetlands in accordance with Executive Order 11990, "Protection of Wetlands" or a floodplain in accordance with Executive Order No. 11988, "Floodplain Management." Additional management requirements for the protection of riparian areas are contained in 36 CFR 219.27(e) and the National Forest Management Act of 1976.

All activities within these areas may require special measures to mitigate adverse impacts to the resource values. They must comply with the above referenced executive orders, regulations, laws and be in accordance with the Forest Land and Resource Management Plan guidelines.

Further information concerning the classification and management of these lands may be obtained from the authorized Forest officer.

(Legal description of land).

Appendix J

Response to Public Comments

The Forest Service has documented, analyzed, and responded to the public comments received on the Draft Environmental Impact Statement (DEIS) for the Proposed Revised Land and Resource Management plan for the National Forests in Alabama. This appendix describes the public comments received and provides the agency's response to those comments. This response complies with section 40 CFR 1503.4, Response to comment of the National Environmental Policy Act (NEPA) regulations.

Analysis of Public Comments

All letters, emails, faxes, and comment forms received as public comment on the proposed forest plan and DEIS were compiled, organized, read, and analyzed by the U.S. Forest Service Content Analysis Team (CAT). This team, a unit of the U.S. Forest Service Washington Office Ecosystem Management Coordination branch, specializes in public comment processing and consideration. This team uses a process they have developed called "content analysis" which allows systematic review of public comment on a proposed plan or project through the creation and use of comprehensive electronic comment database. This method is particularly effective in analyzing voluminous comment both individually and collectively, as required by NEPA.

The CAT analytical process is comprised of three main components: a categorical coding structure and standardized process for its application, a comment database and mailing list, and a set of summary reports. In the content analysis process, each letter, postcard, or other document (collectively referred to as "response letters" in this appendix) is assigned a unique tracking number. Each author or signatory to a response is called a "respondent". All respondents' names and addresses are entered into a project-specific database program to produce a complete mailing list. Each respondent is also assigned a unique identifier number for tracking purposes. All respondents are linked to their individual responses and comments in the database using these identifying numbers. Project-specific demographic information is also recorded in the database, such as any self-identified organizational affiliation, or whether the response letter submitted is part of an organized response campaign.

Staff analysts then read all public response letters in their entirety and proceed to identify discrete comments within them that relate to a particular concern, resource consideration, or proposed management action. Every effort is made to keep each comment within sufficient context that it is a stand-alone statement. Analysts look for not only each action or change requested by the public, but also the reason(s) behind each request in order to capture the full argument of each comment. Therefore, paragraphs within a response letter may be divided into several comments because multiple arguments are presented, or alternatively, several paragraphs that form one coherent statement may be coded into one comment. While simple statements of opinion without a rationale are captured in the process and entered in the project database, it is the strength of each rationale as a complete argument that provides the interdisciplinary team a substantive comment to consider.

Once stand-alone comments are identified, analysts assign each comment to a numerical code that identifies the overall subject area. They use a systematic numerical categorization or "coding" structure that has been specifically tailored to project documents. Each project-specific coding structure is a tool to help sort comments into logical groups by topics. In this case, the coding structure was organized to follow the topic order of the DEIS and components of the proposed forest plan documents, and was designed to be inclusive rather than restrictive in order to sufficiently capture all comments. Depending on project complexity and needs, analysts may also assign secondary codes to track those comments that refer to such subtopics as specific plan or EIS elements, land areas, or individual roads or trails, to permit finer-scale sorting of comments.

After being coded, each response letter's set of coded comments is entered verbatim into the project database. This database serves as the complete project record and allows analysts and planning team members to run specialized reports, identify public concerns, and determine the relationships among them.

The content analysis process also identifies all response letters submitted as part of an organized response (or "form letter") campaign and therefore contain identical text. These are grouped by campaign, and all mailing information for each respondent is entered into the project database, as well as an identifier code for the campaign. Analysts also code a "master" campaign letter and enter all comments verbatim into the project database so that they are considered alongside all non-campaign comments. If a respondent adds original comments to the organized response letter he or she submits, these comments are identified, coded, and entered into the database.

The third phase of content analysis includes composing statements of public concern and then preparing a narrative summary. Analysts review the entire comment database, sorted by topic area, and then write public concerns to summarize comments that present similar arguments or positions. Each formal statement of concern is accompanied by one or more sample comments that provide respondents' specific perspectives and rationales regarding that concern. For each sample comment, a letter number is provided, enabling the reader to track and review the original response, if necessary.

Because each concern statement is a summary, it can represent one or many comments, depending on the actual comments submitted. Concern statements range from extremely broad generalities to extremely specific points because they reflect the content of verbatim public comments. Once the comments have been exhaustively reviewed and the range of concerns identified, CAT then submits a Summary of Public Concerns report to the interdisciplinary team, who is responsible for the next stage of comment consideration, response to comment. At this stage, the interdisciplinary team determines whether comments are substantive and in scope, and then composes responses to comment. For more information on the content analysis process, the reader may contact the Forest Service Content Analysis Team in Salt Lake City, UT.

Public concern statements are not intended to replace actual comment letters or sample quotes. Rather, they can help guide the reviewer to comments on the specific topic in which he or she may be interested. Although the list of public concerns attempts to capture the full range of public issues and concerns, it should be used with caution. Respondents are self-selected; therefore, their comments do not necessarily represent the sentiments of the public as a whole. However, these reports do attempt to provide fair representation of the wide range of views submitted. In considering these views, there is no attempt to treat input as if it were a vote. Instead, the content analysis process ensures that every comment is considered at some point in the decision process.

The final CAT reports are summary documents. As such, they are not intended to replace the need for interdisciplinary team members and decision-makers to directly review all responses and comments. Database reports by topic area allow systematic review of all public responses by subject area. Given the rapidly expanding volume of responses during comment periods due in part to increasing public interest and the widespread use of email, this process can greatly enhance methodical review of comments and meet our goal to continually improve decision-making and responsiveness to the public.

Considering Different Types of Comments under the National Environmental Policy Act

Agencies have a responsibility under the National Environmental Policy act (NEPA) to first “assess and consider comments both individually and collectively” and then to “respond… stating its response in the final statement.” The content analysis process used by the U.S. Forest Service Content Analysis Team (CAT), described in the previous section, considers comments received “individually and collectively” and equally, not weighting them by the number received or by organizational affiliation or other status of the respondent. Public concern statements and supporting quotes from public input form the basic summary of public comment and were the primary focus of our interdisciplinary team in considering comments.

The NEPA requires that after we consider comments, we formally respond to substantive comments. Non-substantive comments, or concerns identified from them, include those that simply state a position in favor of or against an alternative, merely agree or disagree with Forest Service policy, or otherwise express an unsupported personal preference or opinion. We have chosen to respond to all public concerns identified during analysis of public comment, within and out of scope, substantive and non-substantive alike.

Respondents

Agencies, organizations, and groups who responded to the DEIS are listed below.

ROBIN ABELL
ROBERT K. ABERNETHY, NATL WILD TURKEY FEDRN
JOHN & KIM ACKERMAN
MARK ADAIR
JIM ALBERT
RAMONA ALBIN
JEAN & FRANK ALLEN

JEFF ANGLIN
JOEL ATYAS
JOHNNY AYERS
LOIS AYERS
ELIZABETH M. BABINE
ROSEMOND S. BAGGETT-SHANNON
LISA BAILEY
LENN BALLARD
CHUCK BALLARD
TINA BALLARD
STEVEN W. BARNETT
DEWYNE BARTLETT
NORMAN BARTLETT
PAULA & SCOTT BEETON
MICAH BENNETT
JIM BENSMAN, HEARTWOOD
DUANE M. BENTON
KENNETH MARK BIRDITT
DAVID BLEDSOE
AMANDA BORDEN
CHARLES W. BORDEN
YVONNE BRAKEFIELD
J. L. BRASHER
KATHRYN BRAUND
SAMUEL L. BRENTNALL, JR.
MARY & SUZANNE BREZOVICH
BOB BRISTER
KATHERINE N. BROOKSHIRE
ARDETH K. BURLING
SANDRA BUTTON
REBECCA H. CARLISLE
SARAH FRANCISCO & DAVID W. CARR, JR., STHRN ENVIRON LAW CTR
PATRICIA E. CATALDO
HEATHER CAUDILL, SIERRA CLB/GA CHPTR
BEVERLY S. CHASE
LAURA CHELOKE
ALICE CHRISTENSON
JERALD R. COAKER, JR.
DAVID A. COOPER
AARON B. CORNELIUS
BENNIE & RITA CORNELIUS
ROBERT H. COWAN
ROBERT COX
SAHRA COXE
DON CRAPPS
LYNDA M. CREASY
BARBARA SHADEN CREW
FRED L. CRISP
JIM CROOK
CARLA CROWDER
DREW DANKO
CHARLES & JAN DARWIN
EMILY W. DAVIS
THOMAS DEBUTTS
DEBRA O. DELGADO
DIANE DIFANTE

DENNIS DIMON
MARK DONHAM, HEARTWOOD FRST WATCH
LINDA DRIGGERS
NICOLE DUNCAN
STEVEN EACRET
CLIFFORD ELLIOTT
BENNIE & SHIRLEY ERGLE
SHANE K. EVANS
KARRIE ANN FADROSKI
MICHAEL FARLOW
STANLEY FISH
WAYNE FISH
LARRY C., KAREN M., & JERRY L. FITE
POWELL AND SHARON FOSTER
SHARON FOSTER
DANIEL H. FRANK
KIMBERLEY FREEMAN
OUIDA FRITSCHI
MARILIN & T. J. FROST
TERRI FULTON
LONNIE GALIL
DEBORAH & CRAIG GALLAWAY
SUSAN S. GAMBLE
VICKI GARRARD
MIKE GARRETT
JEAN GAUGER
MALCOLM GILLIS, HUNTSVILLE TIMES ROCKET CTY MARTHN
STEVE GINZBARG
PEGGY GOODWIN
GABRIELA MANGINI GRANADOS
VERNON GRAY
LEE GREENBERG
LARRY GREWELLE
PEGGY GRIFFIN
J. A. GRIFFIN
KAREN GRIFFIN
RICHARD OWEN GROOMS
VICTORIA HAEHL
WILLIAM L. HALL
KELLEY HALL, AL ENVIRON CNCL
BRENT HALVERSON
JAMES H. HANCOCK, JR.
GREGORY J. HARBER
KEITH T. HARRELSON
SHIRLEY HARRIS
MARTHA HARTZELL
ALEX J. HARVEY, PH. D.
LEONARD C. HARWOOD
ROGER HAYES, WINSTON CNTY COMM
ALLEN HEDDEN
H. A. HENDERSON
STEVE HENSON, STHRN APPALACHIAN MULTI USE CNCL
LARRY HICE
LEE HILLIARD
THOMAS HOBBS
OWEN C. HOFER

GREGORY HOGUE, DEPT OF INTR/OFC ENVIRON PLCY & COMPLNCE
CAROL J. HONAKER
STEWART HORN
DANNY HORTON
KEITHA HUDSON
BRUCE & FRANCINE HUTCHINSON
MARK SHELLEY & HUGH IRWIN, STHRN APPALACHIAN FRST COALTN
AMANDA S. JACKSON
NANCY JACKSON
STEVE JACKSON
MARK E. JAMES
JOSEPH JOHN, III
JOHN JOHNSON
GWEN JOHNSON
BILL JONES, AL LOGRS CNCL/AL FOR ASSN
B. M. KAISER
GREG KAMPACK
JONATHON KELLER
WALTER S. KELLER
THELIA W. KELLY
JAMES KENNEDY
RENIE R. KING
PETER C. KIRBY
ARTHUR S. KIRKINDALL, CITY OF MADISON/PLAN COMM
JOE KOLOSKI
BRADLEY S. KORB
DAVID L. KOSTONY
MARCI KREISBERG
N. R. KRISHNA
RONALD A. KRIZMAN, DEPT OF THE ARMY/OPRNS DIV
MARY C. KRUEGER, ESTRN FRST ACTION CTR/THE WLDRNSS SCTY
ROBERT L. KUEHLTHAU
MARVIN E. KURTTI
THEODORE M. KUZMA
SUSAN M. LACKEY
JAMES LADD
TOMMY LANGSTON
BARRY LAVIER
MELINDA LEDBETTER
JIMMY H. LEE
LARRY LEE
C. SPENCER LEFFEL
R. MICHAEL LEONARD
MARGARET P. LITTLE
JAMES E. LOESEL, CTZNS TASK FRCE ON NATL FRST MGMT
KAY & JIM LOGAN
JON M. LONEY, TN VLY ATHRTY
FAYE LOWRY
WILLIAM U. LUMOR
THOMAS O. MAHER, PH. D., ST OF AL/AL HISTRCL COMM
WADE MAHLKE
LLOYD MALONE
WILLIAM MARBURG
KEVIN MAREK, MOBILE BAY SIERRA CLB
J. THOMAS MARTIN
DEBRA MARTIN

STEVE MASTERSON
ANDREW MCBATH
HIGH A. MCCLELLAN, DEPT OF THE ARMY
DIANNE MCGEE
ERIC M. MCKSYMICK
WILMA MEADOWS
LARRY & ROBERTA MEANA, SHAWNEE BACKCNTRY HORSEMEN
VINCE MELESKI
MARIE MELLINGER
JUDY MELSON
SHIRLEY MESSER
ROBERT MESSICK
BRADLEY R. MILLER
SIDNEY MITCHELL
VALYA MOBLEY
CELINA D. MONTORFANO, AMERCN HIKING SCTY
ERIN E. MOORE
FREDA T. MOORE
MACHELLE MORALES
O. MORAWE
DONALD B. MORGAN
JULIA MORTENSON
NED MUDD II
SAM MULLINS
CHRIS MURDOCK
BURL MURPHY
MARRY NELSON
LOUISE NICOL
BLANTON M. NOLAND
ROLAND H. NORTON
MEREDITH C. ODOM
GERALD A. OGBURN
LU ARBERY
JUDITH PATLA
MICHELLE PATTERSON
CAROL PATTERSON
DAVID PATTERSON
SHELBY PEAVEY
JOHN PECK
CAROLYN PEINHARDT
PAUL PERRET
J. A. PERRY
FREDRICH PERRY
CAROL PETERSON
M. ANN PHILLIPPI, PH. D.
PAMELA J. PICCIRILLO
JACK PLUNK
JAMES POINTER
PAT & JUDY POLLARD
GENE POLLOCK
CLEVELAND POOLE, PNR ELECTR COOPRTV INC
IRBY H. POWERS
DON PRICE
M. N. PUGH, ST OF AL/DEPT OF CONSERVE & NTRL RESRCS
JOHN N. RANDOLPH
BILLY & JUDY RAPER

BRANNON RAPER
JOSEPH RAY
TIM RAY
W. LARRY RAY
JOHN H. REAVES
C. L. REEVES
ROBERT R. REID, JR., AL AUDBN CNCL/AL ENVIRON CNCL/AL ORNITH SCTY
JACK RELLY, JR.
RESIDENT, HOUSTON, AL
SUSAN RETZLAFF
TERRY RICHARDSON
BILL RIDDLE
RAMON RIDDLE
JOHN C. RIST
WILLIAM & DIANA RISTOM
PATRICIA RIVERA, PH. D.
CHARLENE ROBERSON
BARBARA ROBERTS
FRANK ROBEY
HIRAM ROGERS
ERNEST D. ROGERS
ELIZABETH ROWE
CECIL E. RUST
PATRICIA H. SAGE
DAVID SANDERSON, ECHOTA CHEROKEE TRB OF AL INC
RUTH SANFORD
JOHN SANTAMOUR
H. PHILLIP SASNETT
SCOTT SCHWITTERS
TERRY SEEHORN
JIM SHADDOX
NICHOLAS W. SHARP
JANET D. SHOLES
JERRI SIMMONS
HOMER C. SINGLETON, JR.
RICHARD K. SMITH
JEFFREY K. SMITH
KATHERINE SMOLSKI
CHRISTOPHER C. SONIAT
GARY SPRUNG, INTRNTL MTN BCYCLNG ASSN
HOWARD A. STACY
MIKE STAFF
BILL STOKES, SUNCOAST SIERRA CLUB
SYDNE STONE
BETTY SUSINA
ANN & DONALD SWEENEY
STUART F. TAYLOR
GEORGE & LINDA TAYLOR
LYLE A. TAYLOR
JULIA J. THOMPSON
KATHLEEN TOKUDA
WILLIAM R. TRUEBLOOD
PERRON TUCKER
KELI TUCKER
DAVID UNDERHILL
RAY VAUGHAN, WILDLAW

MRS. RICHARD R. VELVE
DR. STEN VERMUND
MARGARET WADE, AL SIERRA CLUB
MARTHA MARIE WALDROP
HEATHER WALL
TONI WALTON
GLORIA WARD CLEMMENSEN
JOHN WATSON-JONES
KATHERINE S & WARREN E. WEED
FARON K. WEEKS, ECHOTA CHEROKEE HRTG CMMTE
CLARA WELCH
DOUGLAS JOHN WESTER, JR., MD
DENNIS WESTWOOD
ALLISON WHEELER
CHARLES R. WHITE
BOB WHITE
JOHN R. WILLIAMS
JANE WILLIAMS
TODD WILLIAMS, MD
S. WITHERON
PHILIP A. WOOD
K. H. WOODARD
WADE YOUNG
JOSEPH A. YOUNG
ARTHUR & JUDY ZEIGAR
DENNIS ZELINSKY

Comments and Responses

The following is a list of public concern statements and the Forest Service response. The public concern statements are organized by subject area.

Chapter 1

Process, Planning, Policies, and Laws

General Planning Issues

1-1. Public Concern: The Forest Service should recognize that the PRLMP places too much emphasis on project level analysis.

Response: The revised Plans are strategic documents that make decisions on desired conditions, goals, objectives, standards, management prescription allocations, land suitability, monitoring requirements, establishing an Allowable Sale Quantity, making recommendations for Wilderness Study Areas and Wild and Scenic Rivers, and where applicable, consenting to oil and gas leasing. Any further decisions on how to meet this strategic Plan direction are best addressed at the project level.

1-2. Public Concern: The Forest Service should establish a realistic time period for revising the forest plan.

Response: While we were on a tight time frame to make changes between the Draft and Final, time was allocated to make the changes that were needed in the documents, as well as any re-analyses that were needed.

1-3. Public Concern: The Forest Service should not compare the cumulative effects on National Forest System lands to the cumulative effects on private lands.

Response: The cumulative effects analysis does not compare cumulative effects on National Forest System lands to cumulative effects on private lands, but rather looks at the impact of incremental, subsequent, and anticipated actions on National Forest System land.

1-4. Public Concern: The Forest Service should revise and release for comment the PRLMP and DEIS before the publication of the final revised plan and EIS.

TO REFLECT THE FOREST SERVICE'S OWN RECORDS AND ANALYSIS OF THE NATURAL COMPOSITION AND DYNAMICS OF THE SOUTHERN APPALACHIAN FOREST ECOSYSTEM

Response: The process laid out in the National Forest Management Act implementing regulations (36 CFR 219) and the National Environmental Policy Act and its implementing rules do not require a second draft EIS. A supplemental EIS may be *issued if the agency decision-makers feel that substantially new information has been identified. No significant new information has been found in this case.*

1-5. Public Concern: The Forest Service should provide sufficient information in the DIES to allow the Environmental Protection Agency to assess the impacts of the preferred alternative.

Response: The EIS, in Chapter III, contains the assessment of environmental consequences (impacts) of the alternatives, including the preferred alternative. While we feel that there is sufficient information provided to fully assess the impacts of the preferred alternative, we are interested in finding what, specifically, the EPA would like to see in a revised Plan EIS to better assess impacts. A revised Plan is a decision that does not have direct impacts due to its nature. Project level decisions, on the other hand, are where actual ground-disturbing activities are permitted.

1-6. Public Concern: The Forest Service should more effectively avoid or mitigate potential environmental impacts.

Response: NEPA does not require that all impacts be avoided or mitigated. The twin aims of NEPA are to consider alternatives to the proposed action and inform the public of the estimated effects of the alternatives and decision. The EIS adequately describes the entire NEPA process for developing the NFsAL revised Plan. The range of alternatives discussed in Chapter 2, along with the comparison of alternatives in Chapter 3 is the result of nine years of working openly to meet the requirements set forth in NEPA and NFMA. Public involvement is summarized in Appendix A of the EIS

1-7. Public Concern: The Forest Service should acknowledge that the preferred alternative appears to strike a balance between various multiple use activities.

Response: The Forest chose Alternative I because it best responds to the issues developed during the scoping process. Please refer to the ROD for specific reasons Alternative I is the selected alternative.

1-8. Public Concern: The Forest Service should place greater emphasis on ecosystem restoration/enhancement, watershed protection, and recreation.

Response: The ROD discloses the reason that Alternative I is the selected alternative. The alternatives considered in the EIS range from "minimal human intervention" theme to a high commodity production theme. Restoration is a theme mentioned in Alternatives A, B, G and I. Watershed protection and maintenance of water quality is emphasized in all alternatives, however, Alternative F, the no action alternative continues the watershed protection currently provided. All other alternatives use a *more extensive riparian prescription for water quality protection. Recreation remote, roadless, motorized or developed, is emphasized in all alternatives.*

Decisionmaking Authority

Role/Authority

Other Federal Agencies

1-9. Public Concern: The Forest Service should coordinate various land use decisions with the Tennessee Valley Authority.

Response: The Forest Service coordinates with TVA and other federal, state, and private interests through the NEPA process. If you have not been involved in this coordination in the past, perhaps you need to be added to our mailing list at both the Forest and District levels. If additional coordination is desired, please contact Glenn Gaines, District Ranger, Bankhead National Forest (205) 489-5111.

1-10. Public Concern: The Forest Service should collaborate with the U.S. Army Corps of Engineers on water quality and aquatic habitat improvement projects in Alabama's National Forests.

Response: The Forest Service does collaborate with the U.S. Army Corps of Engineers under the regulator authority of the Corps. The Forest Service is also interested in the benefits of collaborating with the Corps on water quality and aquatic habitat improvement projects.

1-11. Public Concern: The Forest Service, as required by NFMA and the Endangered Species Act, should proceed with formal consultation with the U.S. Fish and Wildlife Service.

BECAUSE THE PROPOSED ACTIVITIES MAY AFFECT THREATENED AND ENDANGERED SPECIES AND BECAUSE INADEQUATE INFORMATION AND ANALYSIS EXIST TO CONCLUDE THAT PROPOSED ACTIVITIES ARE NOT LIKELY TO ADVERSELY AFFECT ANY SPECIES

Response: Consultation with the U.S. Fish and Wildlife Service is a part of the planning process and has occurred in this process. Concurrence documentation and Biological Opinion are in the process record.

Role of General Public

1-12. Public Concern: The Forest Service should provide meaningful opportunities for citizen involvement in National Forest System lands management decisions.

Response: The Forest provided many opportunities for this involvement by making available the draft documents, taking comments for at least 90 days, holding meetings, and analyzing all comments.

Local Citizens/Communities

1-13. Public Concern: The Forest Service should utilize local citizens to provide guidance on National Forest System lands management issues.

Response: The Forest has carried out a collaborative process in determining what the public wants to see in this Plan. Issues were discussed openly and debated at a variety of times and places. Local citizens participated in the process.

Outreach/Agency Communication Efforts

1-14. Public Concern: The Forest Service should have better involved the public in the forest plan revision process.

Response: The Forest provided many opportunities for this involvement by making available the draft documents, taking comments for at least 90 days, holding meetings, and analyzing all comments.

Use of Public Involvement/Comment

1-15. Public Concern: The Forest Service should have better integrated public input from the August 2002 public meetings into the preferred alternative.

Response: Comments allude to the Forest "ignoring" public comments received during the earlier planning process. This was not the case. The public meetings held in August of 2002 were very helpful to the forest planning process. In the final decision, all input was considered in balancing the final decisions about the Plan.

1-16. Public Concern: The Forest Service should explain why drastic changes were made to the draft forest plan without public input.

PARTICULARLY IN THE LATTER STAGES OF THE REVISION PROCESS

Response: The changes referred to as "drastic" were made before the Draft EIS was released. Technically, there is no public review draft until the actual DEIS is released. The earlier, publicly released versions were not required under the NEPA. Changes between the draft and final EIS are not unusual; in fact, they are expected as the *decision-making process works through all of the comment and analyzes the factors involved.*

1-17. Public Concern: The Forest Service should require a new comment period if there are significant changes from the draft plan to the final plan.

Response: A new comment period, and a supplemental EIS may be required if the responsible official decides that significantly new information is unearthed or if changes in the decision are outside the range of the alternatives already considered in the draft EIS. In this case, no new information is being presented and the range of the alternatives presented in the draft EIS encompasses the decision that is being made.

Public Meetings

1-18. Public Concern: The Forest Service should schedule additional public meetings near the Alabama National Forests.

Response: The Forest provided many opportunities for this involvement by making available the draft documents, taking comments for at least 90 days, holding meetings, and analyzing all comments.

Adequacy of Comment Period

1-19. Public Concern: The Forest Service should extend the comment period.

BECAUSE THERE WAS CONFUSION AS TO WHEN THE NOTICE OF AVAILABILITY WOULD APPEAR IN THE FEDERAL REGISTER

BY 30 DAYS

BY 90 DAYS

TO 120 DAYS

Response: The responsible official has provided adequate opportunities for public comment and dissemination of information on the analysis and the decision being made.

Collaborative Planning

1-20. Public Concern: The Forest Service should collaborate with interested parties to resolve National Forest System lands issues.

Response: The Forest has carried out a collaborative process in determining what the public wants to see in this Plan. Issues were discussed openly and debated at a variety of times and places.

1-21. Public Concern: The Forest Service should collaborate with state agencies to further aquatic conservation goals.

Response: The Forest Service does collaborate with state agencies to further aquatic conservation goals.

Trust and Integrity

Use of Science

Best Available Science

1-22. Public Concern: The Forest Service should use baseline data as a scientifically proven method to gauge and monitor changing conditions.

Response: Thank you for your comment.

1-23. Public Concern: The Forest Service should base the draft forest plan on sound science.

AND NOT ON THE AGENDAS OF SPECIAL INTEREST GROUPS

Response: The selected alternative is the result of our best efforts to resolve the multiplicity of issues this Plan is attempting to address. Many of those issues conflict with each other, so efforts were made to find the "middle ground" where we could best address multiple issues at the same time. Efforts to define this "middle ground" were dependant upon sorting through the best scientific information available, interdisciplinary team interactions, public input from the various public meetings held throughout this whole planning process, meetings with our various partners, etc. This is no single "source" of information or single "viewpoint" that "drove" this decision. See the Record of Decision for more information on the rationale behind selecting Alternative I.

Maps/Inventories/GIS

1-24. Public Concern: The Forest Service should improve the "textures" of polygons in GIS maps.

Response: The Forest used the best mapping capability it had available at the time. In the future, we expect that better maps will be produced. We appreciate the comments concerning the quality of our maps.

Agency Organization and Funding

General

1-25. Public Concern: The Forest Service should be under the jurisdiction of the Department of the Interior and not the Department of Agriculture.

Response: While this view is appreciated, it is not something within the purview of the Forest Land and Resource Management Plan or the Agency's authority.

1-26. Public Concern: The Forest Service should clarify whether construction is planned in Management Area 4, Talladega National Forest.

Response: The revised Plan provides for landscape level planning. Construction of facilities is a site-specific decision, not a Plan level decision.

Funding

1-27. Public Concern: The Forest Service should ensure that the management of the National Forest System lands is not a burden on taxpayers.

Response: Funding levels ultimately are the purview of Congress and the President, and not a Plan level decision.

1-28. Public Concern: The Forest Service should seek additional funding to conduct monitoring.

Response: Funding is clearly a limiting factor for monitoring as well as any other activity of forest management. Funding needs for the monitoring of this Plan will be assessed and planned on the Forest in the initial year of implementation and for each *subsequent year. Funding needs will be reported to the President for agency budget formulation. Funding levels ultimately are the purview of Congress and the President, and not a Plan level decision.*

Additional actions that are being taken and continually explored to stretch available funds and provide for monitoring needs include:

- *Application of remote sensing, geographic information systems and expanded data analysis capacity*
- *Utilization of information provided by other agencies*
- *Partnerships with agencies, universities and professional organizations*
- *Utilizing qualified volunteers to supplement the agency workforce*

Monitoring Task Sheets will be developed to utilize these resources to extend the agency capacity to monitor the effectiveness of the Plan. Annual review and adjustment to the Monitoring Task Sheets will provide for changes needed due to technological advances, shifts in funding and priorities, workforce changes, and new opportunities for cooperation. Research needs will be identified and updated each year for additional effectiveness and validation needs that exceed the monitoring program itself.

Staffing

1-29. Public Concern: The Forest Service should specify, in the final forest plan, the effects of the current administration's outsourcing initiative.

Response: The initiative is a competitive sourcing could eventually have impacts on the Forest; however, no scenarios have been developed to predict these. Other than reasonably foreseeable budgets, administrative process is not considered in land and resource management planning or the NEPA that is required to accompany it.

1-30. Public Concern: The Forest Service should better integrate the different disciplines within the agency.

Response: Planning Teams, supported by the Regional Office supplied many different disciplines. The Interdisciplinary process is, by regulation, an integrated process. Specialists in all major resource areas must work cooperatively on jointly developed direction for the Plan.

Education

1-31. Public Concern: The Forest Service should conduct natural resource education programs for the public.

Response: This is a good suggestion and one that is carried out on every National Forest to some degree. Environmental education is a very valuable tool for National Forest management and can be done to the extent that budgets allow. Land and resource management planning does not normally address environmental education. Other programs on the forests do address environmental education. Chapter 2 of the Plan discusses goals and objectives for natural resources education and public involvement.

Editorial or Technical Comments/Corrections

1-32. Public Concern: The Forest Service should recognize the difficulty of reading the forest plan revision documents on a CD.

Response: Hardcopies of the documents are available at Forest Service offices.

Specific Comments/Corrections

Alabama National Forests

1-33. Public Concern: The Forest Service should make recommended editorial/technical changes to the documents.

Response: Thank you for your comment.

Multiple Forests

1-34. Public Concern: The Forest Service should clarify Table C.1.19.

Response: Table C.1.19 has been revised and clarified. Alternative D is the only alternative that shows a total increase in employment relative to current (alternative F if fully implemented).

1-35. The Forest Service should explain Table C.1.20, which shows that recreation/wildlife/fish impacts are constant throughout all alternatives.

Response: The Forest attempted to accommodate the desired emphasis for the various alternatives by the application of the management prescriptions. Different prescriptions create different recreation settings. Some alternatives were designed to have better settings for recreation than others. However, the Forest made an assumption that recreation budgets and facilities would remain essentially stable during the life of the

Plan. Therefore, for purpose of comparison of alternatives, labor income is projected as constant across the alternatives.

Wildlife habitat is affected by the management prescriptions applied. The various alternatives favor particular species by the creation of habitat. However, for the comparison of alternatives, the Forest made an assumption that what would be lost for one wildlife value in a particular alternative would be gained in another. This would lead to wildlife and fish labor income being flat for purposes of comparing the alternatives.

1-36. Public Concern: The Forest Service should specify research needs, as recommended in Appendix I.

Response: The National Forest Management Act, through its implementing regulations, requires, in Section 36 CFR 219.28, that such research needs be identified in forest planning. The Regulation also states that "particular attention should be given to research needs identified during the monitoring and evaluation…". One commenter supplied a list of some suggested areas of research for consideration. We have considered these. Most are questions that will be addressed through monitoring and evaluation under the Plan. Most research on national forests is done through Forest Service's research branch and in response to monitoring. Chapter 5 of the revised Plan addresses research needs associated with the revised Plan.

1-37. Public Concern: The Forest Service should include, in Appendix I, a listing of research needs.

Response: See response to PC 1-36.

1-38. Public Concern: The Forest Service should tailor the language in Appendix B to reflect the process used in developing the five Southern Appalachian Forest Plans.

Response: There are some sections in Appendix B where the Forests used similar write-ups, but for the most part, each Appendix B was written to reflect the analysis process used on each Forest.

Tribal

American Indian Use of Public Lands

Cultural Interests

1-39. Public Concern: The Forest Service should use guidelines from the Alabama Historical Commission and the Indian Tribal

Councils to protect Indian heritage sites on National Forest System lands.

Response: Under Section 106 of the National Historic Preservation Act (NHPA) the Forest Service is directed to consult and offer comment to the State Historic Preservation Officer (SHPO) and the Tribal Historic Preservation Officer (THPO).

1-40. Public Concern: The Forest Service should treat the Echota Cherokee as an interested community group.

Response: The Echota Cherokee have input to the management activities on the Bankhead National Forest.

Relation to or Consistency with Other Plans, Directives, Etc.

Forest Service Plans, Directives, and Policies

1-41. Public Concern: The Forest Service should ensure that the PRLMP is consistent with national and regional guidance.

Response: The development of the revised Plans for the National Forests in the Southern Appalachian (with the exception of the Nantahala-Pisgah NFs) involved a high level of coordination between the Regional Office and the five forest planning revision efforts. This coordination started with the development of the Southern Appalachian Assessment, the issuance of the Notice of Intent, and then the identification of the "common" issues to be addressed. Regional guidance was provided in such things as the regional old growth guidance, guidance on determining the roadless area inventory, guidance on evaluating the roadless areas for possible wilderness designation, guidance on watershed analyses, a common set of Management Prescriptions, common "themes" for the alternatives, a common set of "design criteria" for developing Alternative I, and common outlines for the revised Plan and the EIS. In addition to this guidance, teams were set up which included individuals from both the Forests and the Region to develop a common approach to developing Forest Plan direction and environmental impact analyses. These teams included one for addressing fisheries and wildlife issues, one for addressing recreation/wilderness/scenery issues, one for addressing riparian/watershed issues, and another informal team to address forest management issues. Lastly, all the Southern Appalachian planners met periodically to work on coordination/consistency issues. All this was used to develop a regionally consistent framework for developing revised Plans in the Southern Appalachians. However, there were also "local" issues, concerns, publics, situations, and circumstances that needed to be addressed. So while there was the "regional framework" for conducting planning, the Forests could vary within that framework to meet local needs.

1-42. Public Concern: The Forest Service should include a field guide or implementation guide as appendices to the forest plan.

Response: The decision was made to not encumber the revised Plan with guidelines, which are essentially the "how to's" of implementing the revised Plan. Guidelines are usually the "best" or recommended way of accomplishing something, but often there are other methods that are just as acceptable. Given this, it was decided that guidelines did not need to be incorporated into the revised Plans, but should instead be identified in primarily Forest Service Handbooks. The Handbooks, are the part of the Forest Service's directive system which documents the recommended "how to's" of meeting Forest Service policy and direction.

Healthy Forest Initiative

Planning Rule

1-43. Public Concern: The Forest Service should incorporate the general direction of the revised planning rule in the Region 8 forest plan revisions.

Response: There are many good concepts presented in the proposed planning rule of 2002, and where those concepts were consistent with the 1982 planning rule, we attempted to implement those concepts. However, since the "revised" planning rule is still draft and subject to change, we cannot implement something that is draft and we have to follow the rule that is in effect, which is the 1982 planning rule.

Consistency among Region 8 Forest Plans

1-44. Public Concern: The Forest Service should ensure that regional consistency takes precedence over the autonomy of individual forest plans.

Throughout the planning process for the National Forests in the Southern Appalachians, efforts have been made to meet both regional consistency concerns as well as providing the flexibility to address local concerns. Often times, efforts to address regional consistency would be in conflict with meeting local needs, and vice versa. In order to address these often mutually exclusive efforts, the strategy was developed where there would be a common framework for the Revised Plans and EISs (in terms of such things as a set of common issues, a common set of management prescriptions to choose from, and common approaches to conducting various planning analyses). However, within this common framework, the individual Forests could make adjustments to meet their local situation (this included "localizing" the desired condition statements, goals, objectives, standards and management prescription allocations).

1-45. Public Concern: The Forest Service should use consistent formats across the five forest plans.

Response: To the extent that it was possible consistent formats were used for the revised Plans and EISs. We felt that this was important since the revised Plans would come under intense public review and we wanted that review to go smoothly and make it possible for cross-forest comparisons.

1-46. Public Concern: The Forest Service should develop specific, specialized forest plans for each of the Region 8 forests.

Response: Throughout the planning process for the National Forests in the Southern Appalachians, efforts have been made to meet both regional consistency concerns as well as providing the flexibility to address local concerns. Often times, efforts to address regional consistency would be in conflict with meeting local needs, and vice versa. In order to address these often mutually exclusive efforts, the strategy was developed where there would be a common framework for the Revised Plans and EISs (in terms of such things as a set of common issues, a common set of management prescriptions to choose from, and common approaches to conducting various planning analyses). However, within this common framework, the individual Forests could make adjustments to meet their local situation (this included "localizing" the desired condition statements, goals, objectives, standards and management prescription allocations).

Other Planning Issues

Legal

Laws, Acts, and Policies (General)

Federal Laws, Acts, and Policies

National Environmental Policy Act

1-47. Public Concern: The Forest Service should comply with NEPA.

Response: The NEPA process has been followed in the development of the EISs that accompany the revised Plans.

1-48. Public Concern: The Forest Service should consider that the PRLMP and accompanying DEIS violates provisions of NEPA.

BY NOT CONSIDERING THE ALTERNATIVE OF RETURNING FORESTS OF THE REGION TO THEIR NATURAL DYNAMICS

BY NOT ADEQUATELY ANALYZING CUMULATIVE IMPACTS

BY HAVING THE CONTENT ANALYSIS TEAM IN SALT LAKE CITY ANALYZE THE COMMENTS

BY NOT ANALYZING ALL VIABLE ALTERNATIVES

BY NOT PROVIDING A FULL AND FAIR DISCUSSION OF SIGNIFICANT INFORMATION

BY NOT TAKING A "HARD LOOK" AT THE ENVIRONMENTAL CONSEQUENCES OF AGENCY ACTIONS

BY FAILING TO DISCLOSE OR RESPOND TO THE OPPOSING EVIDENCE AND ANALYSIS PRESENTED BY AN EMPLOYEE OF THE AGENCY

BY NOT ADDRESSING THE UNCERTAINTIES AND RISKS ASSOCIATED WITH THE SUCCESSION-BASED MANAGEMENT APPROACH

BY NOT INCLUDING ALL RELEVANT INFORMATION IN THE DOCUMENTS

BY NOT USING GOOD DATA AND RELYING ON SPECULATION

BECAUSE THE DEIS FAILS TO IDENTIFY AND ANALYZE IMPACTS IN MANY AREAS

Response: The alternatives and desired conditions were not arbitrary. Alternative C considered, but not in detail, a custodial level of management that essentially allows the forest to be shaped by natural disturbances. Alternative G provided large acreages late successional forest. Naturally generated disturbances cannot be relied upon for the desired timing, size, and distribution needed for regeneration and openings in other alternatives.

The DEISs disclose the environmental effects, including cumulative effects of the proposed programmatic alternatives commensurate with the revised Plan stage of decision making. Forest Plans do not generally make final irreversible or irretrievable decisions.

The commenter disagrees with the assumptions underlying standards for buffer widths to protect streams. We believe the standards are adequate.

Comments were read, sorted, catalogued, and grouped by the Content Analysis Team—the responses were made by the Forests and Regional Office ID Team members and specialists.

The range of alternatives is adequate.

The commenter does not explain what information was omitted or discussed unfairly or insufficiently.

There is no requirement to include discussions from all proponents of theories on the genesis of current forest conditions or to incorporate the data they claim as supporting.

The teams did consider the information available concerning the natural processes that occur in the Southern Appalachians. Acres in many of the Management Prescription allocations do not have scheduled entries to create successional forests, and instead rely primarily on natural processes.

The management activities contemplated under the alternatives are not new and uncertain practices. The effects of these activities at a programmatic level are disclosed in the EIS. Site-specific effects will be analyzed at the project level.

There is no requirement to develop an alternative that does not meet the purpose or desired conditions. Alternative C, custodial management, was considered, but not developed.

There is no requirement that all information in the process record be in the DEIS or that all theories and information reviewed be included in the record. NEPA documentation was not intended to be encyclopedic.

The first part of this comment lacks specificity as to any information or data that the commenter claims was not good. With respect to the Biological Opinion, in accordance with USFWS procedures, the Biological Opinion is issued when the ROD is issued. NatureServe is a reputable contractor we used to create a database on species and their habitats.

National Forest Management Act (NFMA)

1-49. Public Concern: The Forest Service should consider that the PRLMP violates provisions of the National Forest Management Act.

BY FAILING TO DISCLOSE RECORDS AND STUDIES RELEVANT TO THE REVISION PROCESS

Response: Questions were raised by a specialist who contends the Southern Appalachian forests are naturally uneven-aged, and regenerate predominately through "gap-phase dynamics" rather than by larger, more severe disturbances. Some commenters fault the Forest Service for not considering this information.

Contrary to assertions made by some commenters, information compiled by the specialist was considered during planning. It was distributed to staffs of all Southern Appalachian forests undergoing revision, and was reviewed by planners at the forest and regional levels. Points of agreement and disagreement were discussed at varying levels across these forests. There are many points of agreement, which are corroborated by a predominance of mainstream scientific literature. We agree that some major forest types in the Southern Appalachians are low disturbance systems that *commonly regenerate through natural development of relatively small canopy gaps, and that frequent fire in these systems is not desirable. These areas of agreement are incorporated in the revised Plan and EIS through direction and analysis for mesic deciduous forests, which include cove, riparian, mixed mesophytic and northern hardwood forests. This direction and analysis considers the amount of these forests allocated to Forest Successional Options 1 and 2 (which should be dominated by gap-phase processes), the need for canopy gaps within these forests, and the limited role of fire (cite Mesic Deciduous Forest Section of EIS, and appropriate objectives and standards from the revised Plan). There are, however, some conclusions with which we disagree, as do some members of the academic and research communities with whom we have consulted.*

Endangered Species Act

1-50. Public Concern: The Forest Service should consult with the U.S. Fish and Wildlife Service in order to comply with the Endangered Species Act.

Response: We have consulted with the Fish and Wildlife Service. Consultation was initiated on August 15, 2003. We received written concurrence on our findings for 29 species. Seventeen additional species had a "no effect" determination and as such no consultation was necessary.

"Consultation" is a process for which Federal agencies review their proposal(s) with the Fish and Wildlife Service. It may either be informal for formal for each species depending on the findings of the Biological Assessment completed by FS biologists. The consultation process is completed when the FS receives a concurrence or a biological opinion for that species. It is important to note that the consultation with the Fish and Wildlife Service is conducted for each species in a proposal, not the entire proposal.

Data Quality Act

1-51. Public Concern: The Forest Service should recognize that the PRLMP is in violation of the Data Quality Act.

Response: The Data Quality Act (DQA) is an attempt by Congress to ensure that federal agencies use and disseminate accurate information. The DQA requires federal agencies to issue information quality guidelines ensuring the quality, utility, objectivity, and integrity of information that they disseminate and provide mechanisms for affected persons to correct such information. Congress enacted the DQA primarily in response to increased use of the internet, which gives agencies the ability to communicate information easily and quickly to a large audience. The comments that led to this Public Concern Statement point to the Forest not providing alternatives to large scale burning *programs. This is a process question and not one that turns on providing accurate and complete information.*

Eastern Wilderness Act

1-52. Public Concern: The Forest Service should ensure compliance with the Eastern Wilderness Areas Act.

Response: The National Forests in Alabama acknowledges its commitment to comply with this and all other applicable laws and regulations.

Alternatives

Alternatives

Alternatives (General)

Alternatives Development/Range

2-1. Public Concern: The Forest Service should continue to use the design criteria to guide the formulation of alternatives.

Response: The "design criteria" was used only for the process of developing Alternative I. The other alternatives were developed to meet the "themes" of those alternatives.

2-2. Public Concern: The Forest Service should evaluate a no commercial logging alternative.

BECAUSE THERE IS NO ADEQUATE RATIONALE FOR NOT INCLUDING THIS ALTERNATIVE

Response: Numerous comments were made about the desire to have the National Forests managed under Alternative C, which is an alternative with "minimal human intervention", or to have an alternative with "no commercial timber harvesting". These two concepts are closely related and the responses to these concepts are therefore similar. The rationale for not analyzing these alternatives in detail is described in Chapter 2 of the EIS under "Alternatives Considered but Eliminated from Detailed Study".

Alternative C was an alternative developed and considered, but after additional analysis and developing more alternatives, it was determined that the other alternatives would better meet the purpose and need, and do a better job of addressing all the issues. So it was decided we did not need to continue analyzing this alternative any further.

The purpose and need of revising the Forest Plan is to address the changing conditions that were identified in the Southern Appalachian Assessment, the Forest's Analysis of the Management Situation, and the changing public values as represented by the 12 common issues and 7 local issues. Alternative C would not address all these needs. The Multiple-Use Sustained Yield Act states that the Secretary of Agriculture should "develop and administer the renewable surface resources of the national forests for multiple use and sustained yield of the several products and services obtained there from" (Section 2). Alternative C does not accomplish this. Additionally, in the *regulations implementing the National Forest Management Act, the requirement to "maintain viable populations of existing native and desired non-native vertebrate species in the planning area" (36 CFR 219.19) would not be met.*

Many comments argue that no commercial harvesting is needed to protect watersheds and wildlife. But there are hundreds of different species of wildlife on the national forest, and "human intervention" is needed to provide or enhance the habitats for some of those species. In all the alternatives, the percentage of the forests in "mid- to late-successional" habitats ranges from 54% to 100% of the total forest acreage. Also the riparian corridor prescription is applicable in all the alternatives except Alternative F, and this management will protect the Forest's aquatic resources. Elsewhere in the Plan, protective measures are in place to protect the watersheds in the Forest.

Providing for recreational opportunities is a key component of every alternative, and two of the issues to be addressed with the revised Plan involve providing for recreational opportunities and managing the forests to protect their scenic resources.

Some argue that commercial logging costs the taxpayer or is a subsidy to the timber industry. But having a contractor implement the management actions needed to meet the desired conditions, and returning money to the US Treasury in the process, is often the most cost-effective way to accomplish meeting those objectives.

2-3. Public Concern: The Forest Service should consider a wider range of wilderness and roadless area recommendations.

Response: The alternatives in the EIS provide a range of recommendations. In Alternative A, 100% of the total roadless area acreage is recommended for wilderness study designation or in prescriptions that maintain Roadless characteristics. In Alternative D, 13% of the roadless area acreage is recommended for wilderness study designation or in prescriptions that maintain Roadless characteristics. Every roadless area is recommended for wilderness designation in at least one alternative considered in detail. Alternative E recommends for Wilderness Study additional areas that do not meet Roadless criteria.

2-4. Public Concern: The Forest Service should revise the DEIS to consider a full spectrum of reasonable alternatives.

INCLUDING AN ALTERNATIVE THAT ELIMINATES COMMERCIAL LOGGING

INCLUDING AN ALTERNATIVE TO PRESCRIBED BURNS AND EVEN-AGED MANAGEMENT

INCLUDING ALTERNATIVES C, H, E, AND G

Response: Numerous comments were made about the desire to have the National Forests managed under Alternative C, which is an alternative with "minimal human intervention", or to have an alternative with "no commercial timber harvesting". These two concepts are closely related and the responses to these concepts are therefore similar. The rationale for not analyzing these alternatives in detail is described in

Chapter 2 of the EIS under "Alternatives Considered but Eliminated from Detailed Study".

Alternative C was an alternative developed and considered, but after additional analysis and developing more alternatives, it was determined that the other alternatives would better meet the purpose and need, and do a better job of addressing all the issues. It was decided we did not need to continue analyzing this alternative any further.

The alternatives presented in the EIS provide a range of levels of prescribed burning. (See Chapter 2 of the EIS, Comparison of Alternatives, under the Forest Health Issue.)

The EIS in Chapter 2, under Alternatives Considered but Eliminated from Detailed Study, describes the rationale for why Alternatives C and H were not analyzed in detail. Alternatives E and G are viable alternatives that were considered in detail. The Record of Decision documents the rationale for why Alternative I was selected over the other alternatives.

2-5. Public Concern: The Forest Service should consider the Alabama Wilderness Alliance's Alternative W.

Response: Every roadless area was evaluated for potential wilderness study status. In addition to the roadless areas, the Thompson Creek Area of the Bankhead National Forest and the Rebecca Mountain Area of the Talladega Ranger District were considered for wilderness study status in Alternative E. The Dugger Mountain Expansion Area was considered for wilderness study status in Alternative G. These non-roadless were considered due to the known strong interest of some citizens. Wilderness advocates agree there is not enough wilderness in Alabama, but this is not unique to wilderness. All National Forest resources are limited. The difficulty is application of the appropriate allocations towards the various demands.

The following describes the status of the proposed wilderness study areas presented in this concern statement.

<u>Bankhead Ranger District</u>
The Thompson Creek Area was assigned the Remote Backcountry Recreation-Few Open Roads prescription in Alternative I. The experience planned for is semi-primitive. This area was assigned the Recommended Wilderness Study Area prescription in Alternative E.

The non-roadless Brushy Creek Area was not assigned wilderness study or a wilderness friendly prescription in any of the alternatives.

<u>Conecuh Ranger District</u>
Part of the proposed Bear Bay Wilderness Study Area was assigned the Natural Area-Few Open Roads prescription in Alternative I. This would include natural evolving landscapes and semi-primitive non-motorized experiences. This area, with even more acres, was assigned the Remote Backcountry-Few Open Roads in Alternatives A, B, and E.

<u>Oakmulgee Ranger District</u>
Reed Brake was assigned the Research Natural Area Prescription in Alternative I. This would include natural evolving landscapes and semi-primitive non-motorized experiences. The non-roadless Mayfield Creek Expansion of Reed Brake was not assigned wilderness or wilderness friendly prescriptions in any of the alternatives.

<u>Shoal Creek Ranger District</u>
The Blue Mountain Area was assigned the Remote Backcountry Recreation-nonmotorized prescription in Alternative I. This would incude natural evolving landscapes and semi-primitive non-motorized experiences. This area was assigned the Recommended Wilderness Study Area prescription in Alternatives A, B, and G.

The Oakey Mountain Area was assigned the Remote Backcountry-Few Open Roads prescription in Alternative I. The experience planned for is semi-primitive. This area was assigned the Recommended Wilderness Study Area prescription in Alternatives A and G.

The non-roadless Dugger Wilderness Expansion Area was assigned the Remote Backcountry-Few Open Roads prescription in Alternative I. The experience planned for is semi-primitive. This area was assigned the Recommended Wilderness Study Area prescription in Alternative G.

<u>Talladega Ranger District</u>
The Blue Mountain Area was assigned the Remote Backcountry Recreation non-motorized prescription in Alternative I. This would include natural evolving landscapes and semi-primitive non-motorized experiences. This area was assigned the Recommended Wilderness Study Area prescription in Alternatives A, B, and G.

The non-roadless Rebecca Mountain Area was not assigned a wilderness study or wilderness friendly prescription in Alternative I. This area was assigned the Recommended Wilderness Study Area prescription in Alternative E.

Alternatives Not Considered in Detail

Alternatives Not Considered in Detail

2-6. Public Concern: The Forest Service should not provide additional analysis for Alternatives C and G.

Response: *We presume the commenter meant Alternatives C and H since Alternative G was developed in detail. We are glad the commenter agrees with our rationale that these two alternatives did not need to be analyzed in detail.*

2-7. Public Concern: The Forest Service should have analyzed Alternatives C and H.

BECAUSE THE PLAN DOES NOT CONSIDER THE MINIMUM LEVEL BENCHMARK AS AN OPTION FOR MANAGEMENT OF THE ALABAMA NATIONAL FORESTS

Response: Numerous comments were made about the desire to have the National Forests managed under Alternative C, which is an alternative with "minimal human intervention", or to have an alternative with "no commercial timber harvesting". These two concepts are closely related and the responses to these concepts are therefore similar. The rationale for not analyzing these alternatives in detail is described in Chapter 2 of the EIS under "Alternatives Considered but Eliminated from Detailed Study".

Alternative C was an alternative developed and considered, but after additional analysis and developing more alternatives, it was determined that the other alternatives would better meet the purpose and need, and do a better job of addressing all the issues. So it was decided we did not need to continue analyzing this alternative any further.

The purpose and need of revising the Forest Plan is to address the changing conditions that were identified in the Southern Appalachian Assessment, the Forest's Analysis of the Management Situation, and the changing public values as represented by the 12 common issues and 7 local issues. Alternative C would not address all these needs. The Multiple-Use Sustained Yield Act states that the Secretary of Agriculture should "develop and administer the renewable surface resources of the national forests for multiple use and sustained yield of the several products and services obtained there from" (Section 2). Alternative C does not accomplish this. Additionally, in the regulations implementing the National Forest Management Act, the requirement to "maintain viable populations of existing native and desired non-native vertebrate species in the planning area" (36 CFR 219.19) would not be met.

Many comments argue that no commercial harvesting is needed to protect watersheds and wildlife. But there are hundreds of different species of wildlife on the national forest, and "human intervention" is needed to provide or enhance the habitats for some of those species. In all the alternatives, the percentage of the forests in "mid- to late-successional" habitats ranges from 54% to 100% of the total forest acreage. Also the riparian corridor prescription is applicable in all the alternatives except Alternative F, *and this management will protect the Forest's aquatic resources. Elsewhere in the Plan, protective measures are in place to protect the watersheds in the Forest.*

Providing for recreational opportunities is a key component of every alternative, and two of the issues to be addressed with the revised Plan involve providing for recreational opportunities and managing the forests to protect their scenic resources.

Some argue that commercial logging costs the taxpayer or is a subsidy to the timber industry. But having a contractor implement the management actions needed to meet the desired conditions, and returning money to the US Treasury in the process, is often the most cost-effective way to accomplish meeting those objectives.

Alternative C

2-8. Public Concern: The Forest Service should reinstate and analyze Alternative C.

BECAUSE THIS ALTERNATIVE WAS UNREASONABLY DROPPED FROM CONSIDERATION

TO COMPLY WITH NEPA

BECAUSE THIS ALTERNATIVE WAS ERRONEOUSLY DROPPED

Response: see response to PC 2-7.

Specific Alternatives

Multiple Alternatives

2-9. Public Concern: The Forest Service should implement Alternative D or F.

BECAUSE THESE ALTERNATIVES BEST RESPOND TO ENVIRONMENTAL ISSUES RAISED IN THE PLANNING PROCESS

Response: The Regional Forester looked at all of the alternatives and chose Alternative "I". Other alternatives were considered and not chosen. The Rationale for this decision is listed in the Record of Decision.

Alternative D

2-10. Public Concern: The Forest Service should implement Alternative D.

BECAUSE IT ALLOWS THE APPROPRIATE LEVEL OF TIMBER HARVEST

BECAUSE IT SUPPORTS LOGGERS IN THE STATE

Response: The Regional Forester looked at all of the alternatives and chose Alternative "I". Other alternatives were considered and not chosen. The Rationale for this decision is listed in the Record of Decision.

Alternative E

2-11. Public Concern: The Forest Service should consider that Alternative E did not receive serious consideration.

Response: The Regional Forester looked at all of the alternatives and chose Alternative "I". Other alternatives were considered and not chosen. The Rationale for this decision is listed in the Record of Decision.

Alternative G

General Considerations

2-12. Public Concern: The Forest Service should consider that Alternative G did not receive serious consideration.

Response: The Regional Forester looked at all of the alternatives and chose Alternative "I". Other alternatives were considered and not chosen. The Rationale for this decision is listed in the Record of Decision.

Recreation Considerations

2-13. Public Concern: The Forest Service should implement Alternative G.

BECAUSE IT EMPHASIZES SEMI-PRIMITIVE, WILDLIFE, AND RECREATION OPPORTUNITIES

Response: The Regional Forester looked at all of the alternatives and chose Alternative "I". Other alternatives were considered and not chosen. The Rationale for this decision is listed in the Record of Decision.

Natural Resource Considerations

2-14. Public Concern: The Forest Service should modify Alternative G.

TO INCREASE THE ALLOWABLE SALE QUANTITY

Response: We believe the commenter is referring to implementing Alternative G because it has a higher allowable sale quantity for the period. The Regional Forester looked at all of the alternatives and chose Alternative "I". Other alternatives were *considered and not chosen. The Rationale for this decision is listed in the Record of Decision.*

Alternative I

General Considerations

2-15. Public Concern: The Forest Service should clarify whether the comparison between the Preferred Alternative and the 1985 Plan is a comparison with the 1985 Plan as implemented or as projected.

Response: Alternative F represents a continuation of the 1985 Forest Plan. It includes projections of what could happen in meeting the desired conditions, goals, objectives, standards, and management prescription land allocations identified in the 1985 Forest Plan. It is true that the implementation of the 1985 Forest Plan has not met the original projections because of budget limitations, lawsuits, administrative changes in priorities, etc. Just as actual implementation of the 1985 Forest Plan did not meet projections, it is just as likely that the actual implementation of the revised Plan will not meet projections. This is why projections of outputs are not the decisions made in a revised Plan. A Forest Plan only makes decisions on desired conditions, goals, objectives, standards, and management prescription land allocations. The projections are only used to provide some estimates of what the environmental effects might be as a result of management activities to meet those desired conditions, goals, etc.; and to provide a comparison of alternatives. In order to make all alternatives comparable, the "no action" or "current management" alternative also needs to be based on "projected" outputs, so it is based on the same set of implementation assumptions as all the other alternatives.

2-16. Public Concern: The Forest Service should explain how Alternative I came to be the preferred alternative.

Response: The rationale for why a particular alternative is chosen is not something that is a part of an environmental impact statement (EIS). An EIS is not a decision document; it discloses the effects of alternative courses of action. At the "Draft" stage, a "preferred alternative" is identified to help facilitate public comment and review. Following that public comment and review, the information in the EIS is updated and a decision is made as to which alternative to select. The rationale for choosing the selected alternative is then documented in the Record of Decision.

2-17. Public Concern: The Forest Service should not implement Alternative I.

BECAUSE THE FOREST SERVICE IGNORED MUCH OF PEER-REVIEWED RESEARCH AVAILABLE THROUGH THE AGENCY'S RESEARCH BRANCH

BECAUSE THE ALTERNATIVE WAS OVERLY INFLUENCED BY ENVIRONMENTAL GROUPS

BECAUSE IT VIOLATES THE ORGANIC ACT OF 1897 AND THE MULTIPLE-USE SUSTAINED-YIELD ACT OF 1960

BECAUSE THE PROPOSED PLAN GOES WELL BEYOND KNOWN NATURAL RESOURCE SCIENCE AND JUMPS INTO SPECULATIVE, SUBJECTIVE AREAS OF HUMAN VALUES AND VISIONS

BECAUSE THE ALTERNATIVE VIOLATES A NUMBER OF ENVIRONMENTAL LAWS

BECAUSE THE ALTERNATIVE WILL RESULT IN AN INCREASE OF TEMPORARY ROADS

Response: Alternative I was developed to address a multiplicity of issues, and many people, groups, and organizations were involved in its development. It was developed through iterations of working and meeting with our various publics, and we consulted with our partners in research throughout the process. The USFWS has also worked with us throughout the process and they will issue their Biological Opinion prior to the Record of Decision being signed (they do not go through the formal consultation process on draft documents).

Alternative I is consistent with the Multiple-Use Sustained-Yield Act and the Organic Act. As for the question on NFMA, the estimates on the methods of logging are found in Appendix E of the Plan. For the question on the National Historic Preservation Act, goals and objectives for managing Heritage Resources are found in Chapter 2 of the revised Plan, along with standards for protecting those resources. There is also the existing Forest Service policy, manual, and handbook direction for protecting archeological sites that did not need to be repeated in the revised Plan.

The revised Plan is designed to avoid and minimize effects on aquatic resources through the forest standards and the riparian corridor management prescription. Concerns about recognizing the importance of transportation are addressed in Chapter 2, (Infrastructure section) of the revised Plan as well where goals, objectives, and standards are identified. However, a Forest Plan does not make site-specific decisions on how each road in the transportation system should be managed. It is true that there will likely be an increase in temporary roads over what has occurred in the past few years, but this will be less than the level associated with the 1985 Forest Plan. In addition, numerous mitigating measures are put in place to ensure that temporary roads minimize their environmental effects.

2-18. Public Concern: The Forest Service should consider that the PRLMP will curtail private property rights.

Response: The revised Plan provides the direction for managing National Forest Lands. The EIS must consider the effects that implementing the alternatives would have on *private land, and the revised Plan includes measures to mitigate off-site effects. However, the revised Plan does not affect private property rights.*

Environmental Considerations

2-19. Public Concern: The Forest Service should implement Alternative I.

BECAUSE IT RESTORES AND MAINTAINS ECOSYSTEMS TO THEIR ORIGINAL PRE-PIONEER STATUS

BECAUSE THE ALTERNATIVE ENCOURAGES ECOSYSTEM-BASED, LANDSCAPE SCALE, AND MULTIPLE SPECIES MANAGEMENT OF NATIONAL FORESTS IN ALABAMA

Response: The Regional Forester looked at all of the alternatives and chose Alternative "I". Other alternatives were considered and not chosen. The Rationale for this decision is listed in the Record of Decision.

Natural Resource Management Considerations

2-20. Public Concern: The Forest Service should not implement Alternative I.

BECAUSE THE ALTERNATIVE DOES NOT PROVIDE THE ACTIVE MANAGEMENT NECESSARY FOR FOREST AND WILDLIFE HEALTH

BECAUSE THE FOCUS OF THE PREFERRED ALTERNATIVE IS HUMAN COMPROMISE AND CONSENSUS RATHER THAN FOREST HEALTH AND SCIENCE BASED NATURAL RESOURCE MANAGEMENT

BECAUSE THE ALTERNATIVE ADVERSELY AFFECTS RARE COMMUNITIES ON THE TALLADEGA NATIONAL FOREST

Response: The nature of forest planning is such that compromises have to be an integral part of developing a revised Plan. If all the publics and all the scientists agreed on what is the "right" way to manage a forest, then developing a revised Plan would be considerably easier. However, scientists do not agree, and the public has a wide range of wants/needs/concerns with respect to the management of the national forests, as is evidenced by all the comments received.

A major emphasis of Alternative I is to manage the forest ecosystems to meet the needs of the wide variety of wildlife habitats found on the national forest. This often includes active management to create those conditions. Forest health is another key component of this alternative. Within this alternative, approximately 389,480 acres (59%) have been classified as "suitable for timber production", and periodic, scheduled harvesting activities will take place on these lands. For a majority of the other lands, "unscheduled" and "unplanned" harvesting activities may still take place in order to address forest health needs.

Wilderness Considerations

2-21. Public Concern: The Forest Service should justify the reduction of wilderness recommendations between the current Alternative I and the draft Alternative I released six months ago.

Response: Alternative I was developed to address a multiplicity of issues, and many people, groups, and organizations were involved in its development. It was developed through iterations of working and meeting with our various publics, and we consulted with our partners in research throughout the process. During this time, areas were being evaluated for wilderness recommendation. The areas that best met the criteria for wilderness recommendation are reflected in Alternative I as released in the DEIS.

Social/Economic Considerations

2-22. Public Concern: The Forest Service should implement Alternative I.

BECAUSE IT PROTECTS ALABAMA'S NATIONAL FOREST SYSTEM LANDS FOR FUTURE GENERATIONS

BECAUSE IT PROVIDES OPPORTUNITIES FOR A VARIETY OF LIFESTYLES WHILE RETAINING THE QUALITY OF OUR NATIONAL FORESTS

Response: The Regional Forester looked at all of the alternatives and chose Alternative "I". Other alternatives were considered and not chosen. The Rationale for this decision is listed in the Record of Decision.

Chapter 3

Environment

Environmental Values

Environmental Values (General)

3-1. Public Concern: The Forest Service should protect forests and the environment.

FOR FUTURE GENERATIONS

FOR RECREATION

TO PREVENT ENVIRONMENTAL EXPLOITATION THAT ENRICHES A FEW

BECAUSE ECOLOGICAL PROTECTION AND RESTORATION IS THE HIGHEST AND BEST USE

BECAUSE THE VALUE OF PLANTS, ANIMALS, AND RECREATION IS GREATER THAN THE COMMERCIAL VALUE OF NATURAL RESOURCES

TO PROVIDE CLEAN AIR AND WATER

TO MINIMIZE THE NEGATIVE EFFECTS OF DEVELOPMENT

TO FACILITATE SCENIC BEAUTY, RECREATION, AND TOURISM

BECAUSE THE FOREST AND SPECIES ARE IRREPLACEABLE

THROUGH ECOLOGICALLY SUSTAINABLE FORESTRY

BECAUSE FORESTS BELONG TO THE PUBLIC AND SHOULD BE MANAGED FOR PUBLIC VALUES

FOR AREAS LISTED IN 'MOUNTAIN TREASURES'

TO FULFILL AGENCY RESPONSIBILITIES

Response: The revised Plans address 12 common issues and other local issues that include the wide range of desires, wants, needs, and concerns that have been expressed by the users of the national forests. Often times, meeting one set of needs/concerns is in conflict with meeting other needs/concerns. The challenge is to try to find the appropriate level of management that will best address all these issues. The Record of Decision explains how the Selected Alternative is the alternative that does the best job of trying to meet the public's demands while protecting the resources.

3-2. Public Concern: The Forest Service should expand the amount of land that is protected.

Response: The revised Plans address 12 common issues and other local issues that include the wide range of desires, wants, needs, and concerns that have been expressed by the users of the national forests. Often times, meeting one set of needs/concerns is in conflict with meeting other needs/concerns. The challenge is to try to find the appropriate level of management that will best address all these issues. The Record of Decision explains how the Selected Alternative is the alternative that does the best job of trying to meet the public's demands while protecting the resources.

3-3. Public Concern: The Forest Service should conduct environmental research.

Response: The research branch of the Forest Service has responsibility for conducting environmental research, while the national forest system is charged with managing the national forests lands. However, research and data collection for research is often done on national forests by the research branch as well as by cooperating universities.

3-4. Public Concern: The Forest Service should conduct site-specific analysis and review scientific data.

TO DETERMINE WHAT EFFORTS ARE NEEDED TO PROTECT RESOURCES

Response: The revised Plan establishes a framework for managing a National Forest in terms of goals, objectives, standards, management prescription allocations, and monitoring requirements. However, the revised Plan generally does not make decisions pertaining to site-specific activities. A NEPA-compliant analysis still needs to be accomplished before making any site-specific project decisions. It is at the project level that this site-specific analysis will occur and any new science or new data is considered with respect to the project being proposed

Physical Elements

Physical Elements (General)

3-5. Public Concern: The Forest Service should conduct appropriate analysis on biological diversity and address the issue more adequately.

Response: Biological diversity is addressed in Chapter 3b of the EIS.

Soils and Geology

3-6. Public Concern: The Forest Service should provide greater protection of soils.

TO COMPLY WITH LAW

Response: The revised Plan recognizes the importance of soils and provides descriptions of soil characteristics in the EIS. Standards are developed to provide protection for planned management activities. Soils standards are found in various resource sections of the revised Plans and forest-wide standards. Site-specific analysis will be conducted at the project level and further protection provided as needed.

3-7. Public Concern: The Forest Service should develop stringent regulations to protect soils.

BECAUSE SOILS AND HYDROLOGY HAVE BEEN NEGATIVELY AFFECTED AND DENUDING IS LIKELY

Response: The Forest Service has developed standards for the protection of the soil resources. Forest Service manual direction contains soil quality standards developed for maintaining site productivity. The Soil and Water Conservation Practices Guide, R-8 Southern Region, also provides direction for protection of soil resources. Standards are also developed at the Forest level to provide protection of the soil resource. Standards are developed using interpretive data from soil inventories, past monitoring, and findings presented by research. At the project level, standards can be added/developed to address previously unknown or new situations as they arise.

3-8. Public Concern: The Forest Service should identify strategies to reduce the amount of short-term soil loss.

TO IMPROVE WATERSHED CONDITION

Response: The range in alternatives provides a strategy for reduction in short –term soil loss. The potential for soil loss is determined by the number of acres disturbed. Each alternative develops different approaches to managing the National Forest that include variations of ground disturbance. The overall strategy for each alternative also includes implementation of standards for the protection of soils or reduction in effects to soils. Alternative I is recognized as having the greatest ground disturbance proposed along with the highest potential for short-term effects to the soil resource. Planning at the project level, regardless of which action alternative is selected, is where more detailed identification of mitigation measures for limiting short-term soil loss occurs.

3-9. Public Concern: The Forest Service should prepare quality and detailed soil inventories, baseline conditions, and site-specific analysis and mitigation measures.

Response: The Forest Draft EIS provide general soils descriptions. Detailed soil inventories, baseline conditions, site-specific analysis and additional mitigation measures will be developed as needed for projects as they are developed in Environmental Analysis.

3-10. Public Concern: The Forest Service should identify threshold values and enhance the description regarding monitoring and standards for soils.

Response: Agree with the comment. The threshold for soils is measured against soil quality standards when monitoring implemented soil standards. The document will be edited to reflect soil quality standards. The use of the terminology "thresholds" will be dropped.

3-11. Public Concern: The Forest Service should analyze and document the effects of roads and timber harvest on soil productivity and sedimentation.

TO COMPLY WITH LAWS

Response: The Forest Service has analyzed and documented the effects of roads and timber harvest on soil productivity and sedimentation in the EIS, Chapter 3, section 3.A Physical Elements, part 1.0 Soils. No statement was made stating construction of temporary roads results in little loss of soil productivity. The statement referred to compares changes in soil productivity and the difficulty of restoration between what is considered long term and short-term effects. Throughout the soil section discussion, it is well documented that permanent roads, temporary roads, and recreational trails are the prime source for soil erosion. Effects to the soil resource are discussed in Chapter 3a, part 1.2. Cumulative effects analysis on site productivity is covered in part 1.4. The area that roads occupy, under the soil section, is measured by miles of roads times width converted to acres. Part 1.3 discusses the effects roads and trails have on the soil resource. Specifically, the area roads occupy is considered land taken out of productivity and, therefore, is not considered as lands having to be maintained or improved for soil productivity.

The Forest Service will monitor the effects of management activities, as required by law, to ensure maintaining site productivity. This is accomplished thru implementation of standards, effectiveness of standards, and thru mitigation or restoration on sites that monitoring has determined necessary to maintain productivity. Monitoring is discussed in Chapter 5 of the Proposed Land and Resource Management Plan, and appendix F contains the monitoring summary table. Specific monitoring plans are to be developed at the project level.

3-12. Public Concern: The Forest Service should conduct soils analysis and monitoring to determine where and how timber harvest may result in nutrient depletion and negative affects to other ecosystem components.

Response: This is a site-specific component of the soils analysis process done at the project level; therefore, it is not contained within this landscape level planning.

3-13. Public Concern: The Forest Service should provide evidence that erosion on steeper slopes has disturbed upland sites.

Response: The Forest Service has numerous documents of specific archeological sites in upland settings that have been disturbed by past erosion. Archeological site forms and survey reports attest to this fact on the Oakmulgee Management Area. Specific documentation of specific areas or sites is beyond the scope of the Land Management Plan. Historically, sheet and gully erosion were documented throughout the Oakmulgee Management Area. The western portion of the Oakmulgee Management Area was declared submarginal farmland, and acquired by the Lands Utilization Division of the Resettlement Administration beginning in 1935.

3-14. Public Concern: The Forest Service should modify language and management plans related to the use of plowing and statements that plowing produces minimal effects.

BECAUSE THE EFFECTS OF PLOWING DEPEND ON SOIL CONDITIONS AND ARCHAEOLOGICAL REMAINS

BECAUSE PLOWING CREATES EFFECTS

Response: As site-specific analyses are completed, surveys for heritage resources will identify areas where significant sites occur. Once sites are identified, they can be avoided, thereby minimizing the effects.

3-15. Public Concern: The Forest Service should include soils in restoration plans for forest communities.

Response: The soil resource has been included in restoration plans as well as other land management proposals. The soil resource is discussed in Chapter 3, section 3.A Physical Elements, sub-section 1.0 Soils.

Karst/Cave and Mine Resources

3-16. Public Concern: The Forest Service should write a cave management plan.

Response: The revised Plan includes caves under the Rare Community Prescription, which provides this habitat a high level of protection wherever it occurs. Management plans for individual caves represents too fine a level of detail for inclusion in the revised Plan. However, it is important to note that provisions of the Federal Cave Resources Protection apply in addition to Plan direction. Management plans for specific significant caves may be prepared during Plan implementation where needed to meet requirements of this law and the revised Plan.

Water Resources

Surface Water

3-17. Public Concern: The Forest Service should implement requirements that protect all streams and surface waters within national forest boundaries.

Response: Federal, State and local laws (i.e. NFMA, Clean Water Act) require that aquatic resources, streams and surface waters be protected. Forest Plans protect aquatic resources by identifying streams, their beneficial uses and developing standards, which protect those resources during management activities. Standards are found in the Riparian Prescription and forest-wide standards. Further protection will be provided as needed at the project level.

Water Quality

3-18. Public Concern: The Forest Service should implement a management plan that avoids and minimizes effects on aquatic resources.

Response: The revised Plans are designed to avoid and minimize effects on aquatic resources through the forest standards and the riparian prescription. Additionally, an aquatic conservation assessment will be conducted and periodically updated as a means to identify, prioritize, and implement management actions to conserve or recover aquatic habitat and species.

3-19. Public Concern: The Forest Service should protect water quality.

Response: Federal, State, and local laws (i.e. NFMA, Clean Water Act) require that aquatic resources, streams, and surface waters be protected. Forest Plans protect aquatic resources by identifying streams and their beneficial uses, and developing standards, which protect those resources during management activities. Standards are found in the Riparian Prescription and forest-wide standards. Further protection will be provided as needed at the project level.

3-20. Public Concern: The Forest Service should coordinate with the State to update its list of impaired waterbodies in order to develop appropriate land management prescriptions.

Response: The Forest coordinates with the State on the list of impaired water bodies as well as on the application and monitoring of Best Management Practices and nonpoint source pollution control.

3-21. Public Concern: The Forest Service should include in its tables a list of specific impaired waterbodies.

TO INCLUDE THOSE LISTED BY THE STATE OF ALABAMA

Response: There are no impaired waterbodies within the National Forests in Alabama. However, there may be impairments outside the forest boundary but within the watershed boundaries. These impairments are not related to forest service activities. This information was used in the analysis in the EIS, Chapter 3, and is a part of the process record.

3-22. Public Concern: The Forest Service should prepare a list to identify miles of streams not supporting beneficial uses.

Response: The miles of streams not supporting beneficial uses is listed on the current 303D list. As aquatic monitoring data is collected on the forest, more detailed information concerning supporting beneficial uses will be evaluated and used in the development of improvement projects.

3-23. Public Concern: The Forest Service should identify critical water supply watersheds and designate them for water supply management prescriptions.

ON NATIONAL FORESTS IN ALABAMA

Response: The Forest Service promotes water quality through the implementation of Forest-Wide Standards and State Best Management Practices, where additional restrictions are placed around public water supplies. Additional designations through management prescriptions are unnecessary.

3-24. Public Concern: The Forest Service should coordinate with the State of Alabama to obtain the most current information on impaired water bodies and develop management prescriptions to reduce pollutant loadings.

Response: The Forest Service used the most current information available from the Alabama Department of Environmental Management. No listed impaired water bodies are within any of the Forest Service's proclamation boundaries, and those impaired water bodies within shared watersheds are listed as impaired for reasons other than Forest Service activities.

3-25. Public Concern: The Forest Service should provide water quality monitoring data for use in watershed assessments.

TO THE STATE OF ALABAMA

Response: The Forest Service is interested in working jointly with the Alabama Department of Environmental Management in providing water quality monitoring data when opportunity and funding are available. The Forest Service and the Alabama Department of Environmental Management have a long-standing relationship on this matter. Additionally, the Forest Service and the USGS are currently trying to get funding to perform a joint water quality monitoring survey that will be available to the Alabama Department of Environmental Management.

Watershed Condition

3-26. Public Concern: The Forest Service should protect watersheds.

TO COMPLY WITH LAWS, REGULATIONS, AND DIRECTIVES

Response: Federal, State, and local laws (i.e. NFMA, Clean Water Act) require that aquatic resources, streams, and surface waters be protected. Forest Plans protect aquatic resources by identifying streams, their beneficial uses, and developing standards, which protect those resources during management activities. Standards are found in the Riparian Prescription and forest-wide standards. Further protection will be provided as needed at the project level. Forest-wide standards have been developed to provide overall watershed protection during management activities.

3-27. Public Concern: The Forest Service should protect streams.

BY USING VEGETATION AROUND WATERWAYS TO COLLECT RUNOFF

Response: Federal, State, and local laws (i.e. NFMA, Clean Water Act) require that aquatic resources, streams, and surface waters be protected. Forest Plans protect aquatic resources by identifying streams, their beneficial uses, and developing standards, which protect those resources during management activities. Standards are found in the Riparian Prescription and forest-wide standards. Further protection will be provided as needed at the project level. Forest-wide standards have been developed to provide overall watershed protection during management activities.

3-28. Public Concern: The Forest Service should designate high priority watersheds to receive special protection.

Response: Based on the results of cumulative effects analysis forest has identified priority watersheds where additional monitoring or detailed study is required. Results of the SSI in the cumulative effects analysis will be used as a guide for future work.

3-29. Public Concern: The Forest Service should incorporate direction, goals, objectives, and standards to address a whole watershed approach of aquatic conservation for recommended issues.

Response: Thank you for your comment.

3-30. Public Concern: The Forest Service should establish explicit management categories and prescriptions for riparian areas.

INCLUDING EPHEMERAL STREAMS

Response: Forest has developed riparian prescriptions specifically to protect, enhance, and restore associated riparian functions and values. Riparian prescriptions are found in Chapter 3 of the revised Plan.

3-31. Public Concern: The Forest Service should adopt additional goals, as recommended, directed toward attaining watershed health.

TO FULFILL REGIONAL GUIDANCE FOR WATERSHED MANAGEMENT

Response: The Forest Service has added additional mitigation measures and directives for ephemeral streams and the management of slopes along the riparian corridor since the draft Plan was published. These additional mitigation measures and directives developed in coordination with USFWS will serve in attaining watershed health from both a water quality perspective and an aquatic species perspective.

3-32. Public Concern: The Forest Service should specify land allocations, standards, guidelines, and planning processes, as recommended, for aquatic conservation areas.

Response: The Forest Service participates in recovery plans with the Fish and Wildlife Service for federally listed species. Standards are specified in the Land Management Plans to protect and conserve all aquatic species

3-33. Public Concern: The Forest Service should rewrite forest wide goals, objectives, and standards to fulfill requirements of their respective classifications and criteria, and to implement recommendations for watershed health.

BECAUSE SOME OBJECTIVES NEED TO BE QUANTIFIED

BECAUSE MANAGERS ARE NOT EXPECTED TO PRODUCE OUTCOMES

Response: Goals, objectives, and standards were developed that respond to issues and concerns for the protection, enhancement, and restoration of riparian areas, perennial, intermittent, and ephemeral streams. Forest-wide standards were developed as well as Riparian Corridor specific standards. Goals, objectives, and standards were reviewed and are appropriate.

3-34. Public Concern: The Forest Service should manage riparian areas based upon site-specific conditions.

Response: If a site-specific field investigation determines the need to vary the widths of the riparian corridor, that width shall become the project level riparian corridor. This corridor shall be determined by an interdisciplinary analysis using site-specific information to ensure that riparian values and functions are maintained.

3-35. Public Concern: The Forest Service should allow flexibility in managing riparian zones.

Response: There exists flexibility in managing riparian zones based on fish and wildlife needs as well as for controlling insect infestation.

3-36. Public Concern: The Forest Service should not allow interdisciplinary teams (IDTs) to establish their own objectives for riparian corridors.

BECAUSE THIS POLICY VIOLATES NEPA

BECAUSE NO OTHER MANAGEMENT PRESCRIPTION GRANTS SUCH FLEXIBILITY

BECAUSE NO CRITERIA IS PROVIDED FOR GUIDING OBJECTIVES

BECAUSE LOCAL STAFF ARE GIVEN TOO MUCH DISCRETION

Response: The only flexibility allowed in riparian corridors is for the treatment of insects and disease, as well as management for wildlife purposes. This flexibility does not extend into the reserve sections of the SMZ.

3-37. Public Concern: The Forest Service should explain how the proposed riparian plan is different from the current management plan, provide a streamside management zone overlay, and publish streamside management standards in documents.

Response: The riparian prescription extends the zone of protection from the current SMZ to the extent of the riparian corridor. The full descriptions of the SMZ were inadvertently excluded from the draft Plan, but have been included in the final.

3-38. Public Concern: The Forest Service should establish riparian corridor standards that specify provisions to guide timber harvest and the construction, use, and maintenance of roads.

TO PROTECT RIPARIAN FUNCTIONS AND AQUATIC RESOURCES

BECAUSE INCREASES IN ROAD USE CAN CREATE NEGATIVE EFFECTS, EVEN WHEN THE AMOUNT OF ROAD REMAINS CONSTANT

BECAUSE RECONSTRUCTION AND MAINTENANCE CAN CAUSE NEGATIVE EFFECTS

Response: Specific road and timber harvest standards are specified in the riparian corridor prescription, forest-wide standards and referenced in State BMP requirements. Standards are also stipulated in contract clauses for road construction and timber harvest. The need for additional standards, road stabilization techniques, and use restrictions will be determined at the project level

3-39. Public Concern: The Forest Service should identify and monitor indicators of watershed health and species viability.

TO PROVIDE SPECIES WITH SUFFICIENT DISTRIBUTION

TO PROVIDE SPECIFIC AND CLEAR CRITERIA FOR MONITORING

TO PROVIDE A LEGALLY DEFENSIBLE MONITORING PROGRAM

Response: As shown in the revised Plan, chapters 2 and 5, a number of different indicators of watershed health and aquatic species viability would be monitored. Water quality, physical elements of aquatic habitat, and indices of aquatic species composition (aquatic insects, mussels, and fishes) would be included. Listed and sensitive species would also be monitored for trends in their abundance, distribution, and habitat suitability.

3-40. Public Concern: The Forest Service should specify protection at the watershed scale with corridors that extend to the drainage divide.

TO FOCUS ON THE WHOLE WATERSHED

TO PROVIDE MANAGEMENT STANDARDS FOR UPSLOPE CONDITIONS AND ACTIONS

TO PROVIDE ANALYSIS OF WATERSHED-SCALE PROCESSES

BECAUSE RIPARIAN CORRIDORS DO NOT PROVIDE SUFFICIENT MITIGATION TO ENSURE WATERSHED HEALTH

BECAUSE LAND-DISTURBANCE ACTIVITIES CAN CAUSE PERSISTENT NEGATIVE EFFECTS

Response: Protection is provided in the Plan for streams, lakes, aquatic resources, wetlands, and floodplains (see Riparian Prescription). Riparian Corridor widths were based on research findings, monitoring data, and current literature recommendations. Further protection will be considered and prescribed as needed when projects are developed.

3-41. Public Concern: The Forest Service should specify requirements to conduct a watershed analysis prior to initiating site-specific project planning, and stipulate the framework for the analysis.

TO INCLUDE CRITERIA BASED ON WATERSHED FUNCTION, ECOSYSTEM PROCESSES, AND CONSERVATION BIOLOGY

TO ENSURE THAT SCIENCE PRECEDES PLANNING AND THAT ANALYSES FOCUS ON RESOURCES

TO INCLUDE INTEGRATED FIELD ASSESSMENTS AND HISTORICAL ANALYSES

TO INCLUDE A 'CLOSE LOOK' AT HABITAT TO SUSTAIN VIABLE SPECIES POPULATIONS

Response: As needed, the forests conduct Watershed Analyses where it is determined that a watershed analysis should be completed to develop a project. Frameworks recommended for the watershed analysis include "Ecosystem Analysis at the Watershed Scale" and " Hydrologic Condition Analysis".

3-42. Public Concern: The Forest Service should conduct a full cumulative effects analysis and discard results and conclusions based on the watershed health index and associated analyses.

BECAUSE THE UNDERLYING ANALYSES ARE FATALLY FLAWED WITH FALSE ASSUMPTIONS, MISINTERPRETATIONS, AND UNSUPPORTED CONCLUSIONS

BECAUSE MORE INFORMATION IS NEEDED CONCERNING CUMULATIVE EFFECTS

BECAUSE THE WATERSHED HEALTH INDEX MASKS POTENTIALLY SIGNIFICANT EFFECTS

BECAUSE THE CUMULATIVE EFFECTS ANALYSIS DOES NOT CONSIDER POTENTIAL IMPACTS TO WATER QUALITY AND AQUATIC HABITAT BEYOND SEDIMENT YIELDS

BECAUSE ACCURACY OF THE MODEL IS REPORTED TO BE + 50%

BECAUSE WATERSHEDS AND FISH SPECIES WITHIN THE SAMPLE WERE NOT REPRESENTATIVE ACROSS THE SOUTHERN APPALACHIANS, NOR FOR SPECIFIC LOCATION OR SPECIES

BECAUSE ALL CUMULATIVE EFFECTS ANALYSIS RESTS ON THE SEDIMENT MODEL'S ESTIMATES

BECAUSE THE CUMULATIVE EFFECTS ANALYSIS DOES NOT CONSIDER THE EFFECTS OF INCREASED SEDIMENT ON MUSSELS AND OTHER SPECIES

BECAUSE DATA COLLECTION AND ANALYSIS EXHIBIT MALFEASANCE

BECAUSE DATA ADJUSTMENTS WERE MADE WITHOUT MONITORING OF ACTUAL CONDITIONS

BECAUSE DIRECT, INDIRECT, AND CUMULATIVE EFFECTS ARE IGNORED

BECAUSE WATERSHED SELECTION AND SAMPLING METHODS ARE QUESTIONABLE

BECAUSE THE CUMULATIVE EFFECTS ANALYSIS DOES NOT PROVIDE USEFUL INFORMATION

BECAUSE THE WATERSHED HEALTH INDEX DOES NOT PROVIDE ANALYSIS BY MANAGEMENT ACTIVITY AND ALTERNATIVE

BECAUSE THE CUMULATIVE EFFECTS ANALYSIS FAILS TO CONDUCT ANALYSIS AT THE SUB-WATERSHED SCALE

BECAUSE THE WATERSHED HEALTH INDEX IS NOT VALID

BECAUSE THE FOREST SERVICE MUST CONSIDER ALL EFFECTS OF PAST AND FUTURE ACTIVITIES

BECAUSE THE CONCLUSIONS OF THE WATERSHED HEALTH INDEX AND CUMULATIVE EFFECTS ANALYSIS ARE A MISAPPLICATION OF SCIENCE

*Response**:** The Forest Service has chosen to address cumulative effects on aquatic species with the watershed condition ranking because it is the most likely source of impacts from management activities, correlates to changes in endemic aquatic species populations, and is the best available science.*

BECAUSE THE UNDERLYING ANALYSES ARE FATALLY FLAWED WITH FALSE ASSUMPTIONS, MISINTERPRETATIONS, AND UNSUPPORTED CONCLUSIONS

Response: The purpose of the Watershed Health Index and associated analyses was designed to identify large-scale attributes that may contribute to maintenance of aquatic systems. Further, the relationship between the proportional increase in sediment and endemic fish species is consistent with current scientific thinking related to the dynamic nature of species response to disturbance (i.e. the ranges of generalist species will expand as those of specialists contract). It is reasonable to assume that *changes in the proportion of endemics accompanies disturbance in the watershed. However, in response to comments, the WHI has been modified, and cutoffs based on Forest Service ownership, riparian land use, and riparian road density have been removed. The process is referred to as the Watershed Condition Ranking to reduce confusion.*

BECAUSE THE WATERSHED HEALTH INDEX MASKS POTENTIALLY SIGNIFICANT EFFECTS.

Response: The Watershed Health Index was replaced with the Watershed Condition Ranking (the relationship between locally adapted species and sediment).

BECAUSE THE CUMULATIVE EFFECTS ANALYSIS DOES NOT CONSIDER POTENTIAL IMPACTS TO WATER QUALITY AND AQUATIC HABITAT BEYOND SEDIMENT YIELDS

Response: Sediment was used as a surrogate to represent all adverse effects on water quality and the effects on associated beneficial uses.

BECAUSE ACCURACY OF THE MODEL IS REPORTED TO BE + 50%

BECAUSE WATERSHEDS AND FISH SPECIES WITHIN THE SAMPLE WERE NOT REPRESENTATIVE ACROSS THE SOUTHERN APPALACHIANS, NOR FOR SPECIFIC LOCATION OR SPECIES.

Response: 1.0 is not the expectation because virtually no streams are composed of 100% endemics. It was never implied in Scott & Helfman (2001) that 0.5 was the point of being 'in balance'. Different regions and drainages support different levels of endemism as indicated by least-disturbed reference conditions. Although data from all southern Appalachian forests were not used to develop the model, the data was stratified by physiographic province and based on species described as highland endemics (those that evolved in high elevation conditions). Therefore, the ecological traits that make the species used in the analysis sensitive to disturbance should be similar to other highland endemics. Nevertheless, fish data from Virginia are currently being analyzed.

BECAUSE ALL CUMULATIVE EFFECTS ANALYSIS RESTS ON THE SEDIMENT MODEL'S ESTIMATES.

Response: The sediment model is a consistent, repeatable process that addresses the effects of management activities upon the aquatic environment.

BECAUSE THE CUMULATIVE EFFECTS ANALYSIS DOES NOT CONSIDER THE EFFECTS OF INCREASED SEDIMENT ON MUSSELS AND OTHER SPECIES.

Response: The relationship between the proportional increase in sediment and endemic fish species is consistent with current scientific thinking related to the dynamic nature of species response to disturbance (i.e. the ranges of generalist species will expand as those of specialists contract). It is reasonable to assume that changes in the proportion of endemics accompanies disturbance in the watershed. The effects of increased *sediment on mussels and other species were not analyzed because of the lack of appropriate data.*

BECAUSE THE WATERSHED HEALTH INDEX DOES NOT PROVIDE ANALYSIS BY MANAGEMENT ACTIVITY AND ALTERNATIVE

Response: The WHI did provide analysis by alternative and included all soil disturbing management activities. However, in response to comments, the WHI has been modified, and cutoffs based on Forest Service ownership, riparian land use, and riparian road density have been removed. The process is referred to as the Watershed Condition Ranking to reduce confusion.

3-43. Public Concern: The Forest Service should explain why specific waterways are ranked as below average as part of the watershed health index study.

Response: As part of the cumulative effects methodology the Forest Service accounts for cumulative effects from both Forest Service land and private land within any given watershed. In all cases, the Below Average rank comes from large amounts of erosion and sedimentation from agricultural, mining, and urban land use practices on private lands, although Forest Service may own a significant portion of a watershed.

Specific waterways are ranked as below average because of the relationship between environmental stressors and locally adapted fish species. However, in response to comments the WHI has been modified and cutoffs based on Forest Service ownership, riparian land use and riparian road density have been removed. The process is referred to as the Watershed Condition Ranking to reduce confusion.

3-44. Public Concern: The Forest Service should implement recommended actions to address aquatic conservation needs of the region.

Response: Recommendations from SAFC and the Pacific Rivers Council stress the importance and protection of key watersheds in the Southern Appalachians that support imperiled fish, mussels, and crayfish. The forest has recognized the importance of aquatic resources and has developed a riparian prescription with specific standards to protect aquatic fauna and biota. Additionally, forest-wide standards have been developed specifically to respond to concern for T&E species.

3-45. Public Concern: The Forest Service should use the 9.A. watershed prescription to protect watersheds and set specific management standards.

TO ADDRESS CONDITIONS AND VULNERABILITIES

TO FOLLOW REGIONAL GUIDANCE FOR THE PROTECTION AND RESTORATION OF WATERSHEDS

Response: The revision ID Team considered applying the 9A management prescription, but determined that other prescriptions would be more appropriate given the restoration and forest health needs on the NFsAL.

3-46. Public Concern: The Forest Service should manage watersheds under 9.A.3 or 9.A.4, as recommended, and follow regional guidance to develop management standards.

Response: See response to PC 3-45.

3-47. Public Concern: The Forest Service should specify a goal to protect and enhance threatened and endangered species as part of watershed management.

Response: S*everal goals and objectives re-iterate the Forest Service responsibility to protect and enhance listed species and their habitats. A goal is included that watersheds are managed to protect ecological functions and support intended beneficial water uses. "Beneficial water uses" encompasses the role of providing habitat for listed species. Additional emphasis on watershed-based approaches has been added by specifying that aquatic conservation plans will be developed as a means of assessing and addressing species viability at the watershed level.*

Watershed Management

3-48. Public Concern: The Forest Service should include additional standards, goals, and objectives for watershed management as recommended by the Environmental Protection Agency.

ON THE NATIONAL FORESTS IN ALABAMA

*Response: Federal, State, and local laws (i.e. NFMA, Clean Water Act) require that aquatic resources, streams, and surface waters be protected. Forest Plans protect aquatic resources by identifying streams, their beneficial uses, and developing standards that protect those resources during management activities. Standards are found in the Riparian Prescription and forest-wide standards. Further protection will be provided as needed at the project level***.**

3-49. Public Concern: The Forest Service should re-examine specific management prescriptions and redesignate certain specific areas for Watershed Restoration.

AND SHOULD PARTNER WITH STATE AND LOCAL AGENCIES TO ASSIST WITH RESTORATION

Response: Watersheds identified with streams on the 303D list included as a data layer in the Eastwide Watershed Assessment Process. This information, along with the results of the cumulative effects analysis, will be considered as the forest develops restoration projects during Plan implementation. The State, local agencies, and partners will be included in the development of watershed restoration projects as appropriate.

Specific Areas

3-50. Public Concern: The Forest Service should protect the Tallaseehatchee and Choccolocco watersheds.

Response: The Forest Service will protect these watersheds through the use of State BMPs and Forest-wide Standards. The Forest Service has also consulted with USFWS to develop specific mitigation measures to protect aquatic species within these watersheds.

Conasauga River Watershed

3-51. Public Concern: The Forest Service should designate the Conasauga River as an aquatic threatened and endangered species watershed 9.A.4.

Response: The Conasauga River is not within the National Forests in Alabama.

Riparian Areas and Wetlands

3-52. Public Concern: The Forest Service should better protect riparian areas.

BECAUSE RIPARIAN AREAS ARE ECOLOGICALLY VALUABLE AS BUFFER ZONES

BECAUSE STREAMS AND RIVERS ARE IMPORTANT TO LOCAL COMMUNITIES

Response: Protection is provided in the Plan for streams, lakes, aquatic resources, wetlands, and floodplains (see Riparian Prescription). Specific standards are prescribed in the Riparian Prescription and forest-wide standards.

3-53. Public Concern: The Forest Service should establish minimum widths for riparian corridors with binding standards and guidelines.

TO COMPLY WITH REGIONAL DIRECTION

TO PREVENT REDUCTIONS IN CORRIDORS

TO RESTORE RIPARIAN ECOSYSTEMS

TO PROVIDE CONSISTENT MANAGEMENT ACROSS ALL SOUTHERN APPALACHIAN NATIONAL FORESTS

Response: The Forest Service does establish minimum widths for riparian corridors with standards, goals, and objectives as outlined under Management Prescription 11 in Chapter 3.

3-54. Public Concern: The Forest Service should analyze the benefits of managing ephemeral streams under the riparian prescription as compared to managing the streams for other resources.

Response: Ephemeral streams were included in the original definition of Riparian Corridors because of their connectivity to stream networks. Ephemeral streams however do not have riparian characteristics and therefore are managed and protected with streamside management zones. Because of their characteristics (i.e. periodic response to stream flow and uncertain identification criteria) specific guidance for management of ephemeral streams is appropriately developed at the forest level. Standards for managing ephemeral streams are included in forest-wide standards.

3-55. Public Concern: The Forest Service should include ephemeral streams in the definition of the riparian corridor and set management standards.

BECAUSE DEFINITIONS IN AN APPENDIX CAN BE CHANGED WITHOUT A PLAN AMENDMENT

Response: Ephemeral streams were included in the original definition of Riparian Corridors because of their connectivity to stream networks. Ephemeral streams however do not have riparian characteristics and therefore are managed and protected with streamside management zones. Because of their characteristics (i.e. periodic response to stream flow and uncertain identification criteria) specific guidance for management of ephemeral streams is appropriately developed at the forest level. Standards for managing ephemeral streams are included in forest-wide standards.

The revised Plan has been clarified since the draft to define ephemeral streams in Chapter 2 with Forest-wide direction. Standards for ephemerals can be found in Chapter 2 of the revised Plan as well.

3-56. Public Concern: The Forest Service should adopt the original definition of riparian corridor.

Response: Ephemeral streams were included in the original definition of Riparian Corridors because of their connectivity to stream networks. Ephemeral streams *however do not have riparian characteristics and therefore are managed and protected with streamside management zones. Because of their characteristics (i.e. periodic response to stream flow and uncertain identification criteria) specific guidance for management of ephemeral streams is appropriately developed at the forest level. Standards for managing ephemeral streams are included in forest-wide standards.*

3-57. Public Concern: The Forest Service should specify standards for protecting streamside management zones and fingers.

Response: The revised Plan has been revised since the draft to define Stream-side Management Zones (SMZs) in Chapter 2 with Forest-wide direction. Standards for SMZs can be found in Chapter 2 of the revised Plan as well.

The Riparian Prescription standards protect streams and aquatic resources. Riparian corridors also capture much of the area that would be protected with SMZs. Where additional protection is needed, forest will implement SMZs (I.e. for steep slopes). Furthermore, State BMPs will be followed which specify SMZs for silvicultural activities.

3-58. Public Concern: The Forest Service should expand riparian areas, riparian corridors, and buffer zones.

BECAUSE HEADWATER STREAMS AND NON-PERENNIAL STREAMS ARE INTENSIVELY AFFECTED BY MANAGEMENT ACTIONS

BECAUSE THE PROPOSED RIPARIAN CORRIDOR STANDARDS ARE INADEQUATE TO PROTECT AQUATIC SYSTEMS

FROM 300 TO 650 FEET

BY RESTRICTING TIMBER HARVEST WITHIN 500 FEET OF RIPARIAN AREAS

BY ESTABLISHING STRINGENT STANDARDS, AS RECOMMENDED

Response: Riparian areas are determined based on physical and biological characteristics (vegetation, soils, and hydrology). Riparian corridors (fixed buffers) are established to encompass the Riparian area. Where fixed widths do not capture the Riparian area, distances are adjusted. SMZs in forest-wide standards are employed as needed at the project level where additional protection is necessary.

3-59. Public Concern: The Forest Service should explain the rationale for eliminating ephemeral streams from the riparian corridor, removing protection, and weakening prescriptions to protect and restore riparian ecosystems.

Response: Subsequent to issuance of Riparian Management direction, ephemeral streams were removed from the riparian corridor description because ephemeral streams do not have the physical or biological characteristics that qualify as "Riparian".

Protection for ephemeral streams was not removed but rather moved to forest-wide standards. The changes made in the Riparian Prescription have not weakened protection of the Riparian area but allows for greater management options for Riparian associated species.

3-60. Public Concern: The Forest Service should implement aquatic conservation and management direction.

TO ATTAIN DESIRED FUTURE CONDITIONS FOR THE AQUATIC SYSTEM

TO FULFILL FEDERAL DUTIES TO CONSERVE AND RECOVER PROTECTED SPECIES

Response: The Forest Service participates in recovery plans with the Fish and Wildlife Service for federally listed species. Standards are specified in the Land Management Plans to protect and conserve all aquatic species.

3-61. Public Concern: The Forest Service should designate secondary riparian zone buffers beyond the primary riparian zones.

TO MITIGATE EFFECTS OF MANAGEMENT ACTIONS ON LAND ADJACENT TO THE RIPARIAN ZONE

TO PROVIDE A BUFFER TO SUSTAIN THE CORE RIPARIAN BUFFER AND SUPPORT WILDLIFE HABITAT

BECAUSE RIPARIAN AREAS ARE UNLIKELY TO RETAIN INTEGRITY AND RESILIENCY IF THE WATERSHED IS NEGATIVELY AFFECTED

TO PROTECT SPECIES

Response: The Riparian Prescription was developed to provide protection, enhance, and restore riparian functions and values. Minimum buffer widths and standards were developed to protect streams, lakes, wetlands, and floodplains. Additional SMZs are included beyond the Riparian Corridor where needed to provide additional protection (i.e. steep slopes or highly erodible soils).

3-62. Public Concern: The Forest Service should define the ephemeral zone as the overall drainage areas of streams, and protect the entire area.

TO INCLUDE UNCHANNELED EPHEMERAL STREAMS

Response: The revised Plan has been revised since the draft to define ephemeral streams in Chapter 2 with Forest-wide direction. This definition includes both channeled and unchanneled streams. Standards for ephemeral can be found in Chapter 2 of the revised Plan as well.

Ephemeral streams were included in the original definition of Riparian Corridors because of their connectivity to stream networks. Ephemeral streams however do not have riparian characteristics and therefore are managed and protected with streamside management zones. Because of their characteristics (i.e. periodic response to stream flow and uncertain identification criteria) specific guidance for management of *ephemeral streams is appropriately developed at the forest level. Standards for managing ephemeral streams are included in forest-wide standards.*

3-63. Public Concern: The Forest Service should include additional standards for ephemeral streams as recommended by the Environmental Protection Agency.

ON NATIONAL FORESTS IN ALABAMA

Response: The revised Plan has been clarified since the draft to define ephemeral streams in Chapter 2 with Forest-wide direction. Standards for ephemerals can be found in Chapter 2 of the revised Plan as well.

3-64. Public Concern: The Forest Service should include a discussion of what additional protections are afforded by riparian corridors as opposed to Streamside Management Zones (SMZs).

AND EXPLAIN WHY IT WILL ESTABLISH RIPARIAN CORRIDORS RATHER THAN USING SMZS AS PRESCRIBED BY THE STATE OF ALABAMA'S BEST MANAGEMENT PRACTICES

Response: The revised Plan has been revised since the draft to define Stream-side Management Zones (SMZs) in Chapter 2 with Forest-wide direction. Standards for SMZs can be found in Chapter 2 of the revised Plan as well.

The Riparian Prescription standards protect streams and aquatic resources. Riparian corridors also capture much of the area that would be protected with SMZs. Where additional protection is needed, the Forest will implement SMZs (I.e. for steep slopes). Furthermore, State BMPs will be followed which specify SMZs for silvicultural activities.

3-65. Public Concern: The Forest Service should set minimum riparian corridor widths.

AND SHOULD USE SITE SPECIFIC EXAMINATION ONLY WHEN IT IS APPROPRIATE TO EXPAND THEM

AND SHOULD INCLUDE INTERMITTENT STREAMS

AND SHOULD EXPAND CORRIDOR WIDTHS TO REFLECT THE ADJACENT SLOPE AND SOIL EROSION HAZARDS

AND SHOULD REQUIRE A PLAN AMENDMENT IN ORDER TO REDUCE MINIMUM WIDTHS

Response: Minimum corridor widths are listed in the Riparian Prescription. A distinction is made between the Riparian Corridor and Streamside Management Zones. Streamside Management Zones will be used to protect streams beyond the Riparian Corridor where necessary due to unstable land, soil erosion concerns, or steep slopes. The forest will meet all State Best Management Practice SMZ requirements.

3-66. Public Concern: The Forest Service should include additional standards that will establish the importance of riparian corridors as buffers for protection of water bodies.

INCLUDING AN ADDITIONAL STANDARD TO REQUIRE A MINIMUM OF 50% CANOPY COVER

Response: Riparian areas are determined based on physical and biological characteristics (vegetation, soils, and hydrology). Riparian corridors are established to encompass the Riparian area. Where minimum widths do not capture the Riparian area, distances are adjusted. SMZs in forest-wide standards provide additional protections.

Specific road and timber harvest standards are specified in the riparian corridor prescription, forest wide standards and referenced in State BMP requirements. Standards are also stipulated in contract clauses for road construction and timber harvest. The need for additional standards, road stabilization techniques, and use restrictions will be determined at the project level.

3-67. Public Concern: The Forest Service should develop standards for riparian zones based on forest-specific criteria.

Response: If a site-specific field investigation determines the need to vary the widths of the riparian corridor, that width shall become the project level riparian corridor. This corridor shall be determined by an interdisciplinary analysis using site-specific information to ensure that riparian values and functions are maintained.

3-68. Public Concern: The Forest Service should restore riparian habits to native vegetation, but without using clearcuts.

Response: Timber harvesting is one method of creating and maintaining understory conditions and of restoring native vegetation. Timber harvesting activities may occur in Riparian Corridors when they are needed to maintain, restore, or enhance riparian functions and values and to meet the needs of Riparian associated species. 36 CFR 219.27(c)(1) states that harvesting activities can occur on lands classified as not suited for timber production when such activities are necessary to protect other multiple-use values or are needed to meet forest plan objectives. Clearcutting is merely one harvest method. However, other harvest methods as discussed in the revised Plan (Appendix E) and other treatments such as prescribed burning may be used as well. Site-specific projects with analyses will determine the treatment used, if any, to accomplish these restoration objectives.

3-69. Public Concern: The Forest Service should clarify objective 8.2.

Response: Response: Objective 8.2 was intended to do two things: 1.) clarify the maximum amount of disturbance-related rare community restoration and early *successional forest provision that may simultaneously occur in an analysis area to be 10%; and 2.) Set an objective for a minimum of early successional riparian forest of 1-2% of the total riparian area in an analysis area.*

Dense cane thickets, wet meadows, and wet savannas are all disturbance-associated rare communities that are found within or near riparian areas. All of these rare-communities are considered non-forested habitats. All of these disturbance-associated rare-communities, as well as early successional forest habitats provide early seral habitats for riparian related species, such as Swainson's warbler, American woodcock, and common snipe.

Timber harvesting activities may occur in Riparian Corridors when they are needed to maintain, restore or enhance riparian functions and values and to meet the needs of Riparian associated species. 36 CFR 219.27(c)(1) states that harvesting activities can occur on lands classified as not suited for timber production when such activities are necessary to protect other multiple-use values or are needed to meet revised Plan objectives.

Early-successional habitat was one of the topics most frequently raised by commenters. Comments were split on the desirability of using active vegetation management within riparian areas for the benefit of wildlife. Some commenters want more specific direction for managing these highly productive areas for oak mast production and early-successional habitats. Others feel these areas should be used to emphasize old growth restoration and protection of aquatic species and water quality. The revised plan attempts to accomplish both. We have recognized the importance and value of riparian areas by creating a separate prescription for riparian corridors. Desired conditions within this prescription emphasize late-successional forests, and many standards are included to ensure maintenance of water quality. These qualities are of primary importance. However, this prescription does not rule out active management, when it can be conducted in ways compatible with maintaining or enhancing riparian resources. Vegetation management projects that enhance mast production or create early successional habitat may be proposed for riparian areas during plan implementation. Monitoring will track the acreage and condition of riparian corridors, including levels of vegetation management activities implemented.

3-70. Public Concern: The Forest Service should actively manage riparian corridors.

TO BENEFIT A VARIETY OF WILDLIFE

Response: Timber harvesting activities may occur in Riparian Corridors when they are needed to maintain, restore, or enhance riparian functions and values and to meet the needs of Riparian associated species. 36 CFR 219.27(c)(1) states that harvesting activities can occur on lands classified as not suited for timber production when such activities are necessary to protect other multiple-use values or are needed to meet *revised Plan objectives. Riparian corridors were designated as not suitable for timber production because it was determined that managing these lands for the purposes of having "regulated crops of trees … for industrial or commercial use" (36 CFR 219.3) was inconsistent with meeting the desired conditions of the riparian corridor.*

3-71. Public Concern: The Forest Service should specify goals to create early successional habitat within corridors.

TO PROVIDE EARLY SUCCESSIONAL HABITAT FOR WILDLIFE

Response: Early-successional habitat was one of the topics most frequently raised by commenters. Early-successional habitats are not all the same in their value to wildlife and in strategies for their management. Types of early-successional habitat that we have addressed include early-successional forests, open woodlands, permanent wildlife openings, and maintained rights-of-way. Percentage objectives within prescriptions, which were the focus of many comments, are for early-successional forest only.

Comments calling for both higher and lower objectives for early-successional forest were common. Commenters in favor of higher objectives included state wildlife management agencies, wildlife professional organizations, hunting and game species conservation organizations, and bird conservationists. In some cases, these commenters suggested specific objective levels, generally ranging from 5 to 15 percent forest-wide. Commenters in favor of lower objectives included environmental organizations and those interested in low intensity management strategies and undisturbed mature forest conditions. These commenters frequently pointed to openings created by natural disturbances and canopy gaps from natural treefall, along with private lands, as habitat sources that reduce the need for creation of early-successional forest on national forest lands.

In a recent review paper by disturbance ecologist Craig Lorimer (Historical and ecological roles of disturbance in eastern North American forests: 9,000 years of change. Wildlife Society Bulletin 2001, 29(2):425-439), Lorimer concludes: "Deciding on the optimal amount of early successional habitat on public lands is a complex ecological and social issue that can be guided only in part by scientific evidence." The diversity of perspectives expressed in comments reflects the complexity of this as a social issue. To provide for this diversity of views, as well as a for a diversity of habitats, we defined four mixes or "options" of successional forest conditions to be assigned to specific portions of the national forest landscape. These options were allocated to the landscape through prescription assignments after considering a variety of factors, including successional habitat abundance and distribution across the forest, settings for other multiple uses, and legal and logistical constraints on management opportunity. We have allocated successional forest options in the Revised Plan in a mix that we feel provides the best balance in meeting the wide range of public desires evident in the comments.

3-72. Public Concern: The Forest Service should not designate riparian corridors as unsuitable for timber harvest, but as suitable.

BECAUSE FUNDING IS NOT AVAILABLE FOR FISHERIES AND WILDLIFE WITHOUT A TIMBER MANAGEMENT PROGRAM

Response: Timber harvesting activities may occur in Riparian Corridors when they are needed to maintain, restore or enhance riparian functions and values and to meet the needs of Riparian associated species. 36 CFR 219.27(c)(1) states that harvesting activities can occur on lands classified as not suited for timber production when such activities are necessary to protect other multiple-use values or are needed to meet revised Plan objectives. Riparian corridors were designated as not suitable for timber production because it was determined that managing these lands for the purposes of having "regulated crops of trees … for industrial or commercial use" (36 CFR 219.3) was inconsistent with meeting the desired conditions of the riparian corridor.

3-73. Public Concern: The Forest Service should specify objectives and standards to actively manage for hard mast of oak and hickory early successional habitat within riparian areas.

Response: Comments were split on the desirability of using active vegetation management within riparian areas for the benefit of wildlife. Some commenters want more specific direction for managing these highly productive areas for oak mast production and early- successional habitats. Others feel these areas should be used to emphasize old growth restoration and protection of aquatic species and water quality. The revised Plan attempts to accomplish both. We have recognized the importance and value of riparian areas by creating a separate prescription for riparian corridors. Desired conditions within this prescription emphasize late-successional forests, and many standards are included to ensure maintenance of water quality. These qualities are of primary importance. However, this prescription does not rule out active management, when it can be conducted in ways compatible with maintaining or enhancing riparian resources. Vegetation management projects that enhance mast production or create early successional habitat may be proposed for riparian areas during Plan implementation. Monitoring will track the acreage and condition of riparian corridors, including levels of vegetation management activities implemented.

3-74. Public Concern: The Forest Service should manage each forest based on forest–specific characteristics and local landscape needs and capacities.

BECAUSE FAILURE TO CONSIDER LOCAL CHARACTERISTICS WILL YIELD AN UNWORKABLE PLAN

Response: Project-level analyses will be done for treatments implementing the direction in the revised Plan. The revised Plan allocation of acres to various management prescriptions was done with reference to forest-specific characteristics and local landscape needs and capacities.

3-75. Public Concern: The Forest Service should modify wording describing the first and second terraces as having high probability for containing prehistoric sites.

BECAUSE HISTORIC SITES MAY NO LONGER BE ADJACENT TO WATER SOURCES DUE TO GEOMORPHOLOGIC CHANGES AND WELL TECHNOLOGY

Response: Site-specific references to archeological sites would be beyond the scope of the Land Management Plan. Generally, the first and second terraces on all management areas have high probability for prehistoric sites. Historic site probability is established after background research has been conducted, checking land acquisition maps and other historic references. Early Archaic period and Paleolithic period prehistoric sites may be found further from present water sources, but this would be specific to some of the larger water sources, such as the Yellow River on the Conecuh Management Area.

3-76. Public Concern: The Forest Service should submit site-specific plans for wetland areas and activities affecting rivers and streams for review by the Army Corps of Engineers.

Response: The revised Plan is a strategic plan. Site-specific projects are done at the District Level and through their NEPA process. Please contact the District Offices for further assistance.

1. *Bankhead Ranger District: 205-489-5111*
2. *Conecuh Ranger District: 334-222-2555*
3. *Oakmulgee Ranger District: 205-926-9765*
4. *Shoal Creek Ranger District: 256-463-2272*
5. *Talladega Ranger District: 256-362-2909*
6. *Tuskegee Ranger District: 334-727-2652*

Wildlife

Wildlife (General)

3-77. Public Concern: The Forest Service should survey and monitor rare wildlife populations.

Response: Some commenters expressed satisfaction that viability evaluations have identified species and habitats most at risk, leading to appropriate attention to conservation of the most threatened habitats and communities. Other commenters pointed to the need for additional "fine-filter" considerations to provide for species viability. Most of these commenters focused on the need for more specificity regarding inventory and monitoring of species of viability concern, including those of local viability *concern ("locally rare" species). We agree that inventory and monitoring are critical and necessary components of a program to provide for species viability. The issue is where in the overall planning process the details of these components are considered and documented.*

Because of the incredible diversity of species on the forest, monitoring populations of every species of potential viability concern is not feasible. Practical monitoring programs must combine monitoring of habitat conditions, populations of indicator species, and populations of priority viability concern species. This combination is reflected in the Revised Plan's monitoring chapter, which includes monitoring questions that cover all of these elements. The Monitoring Summary Table in Appendix F of the Revised Plan provides more specifics on relevant elements to be monitored. Task sheets, to be used for implementing the monitoring program, provide additional detail, and are available upon request. In addition, Task 42 in the Monitoring Summary Table indicates additional inventory and monitoring of viability concern species (including "locally rare" species, where appropriate) will occur based on prioritization developed and revised during Plan implementation. Prioritization will involve use of more site-specific information on species occurrences, in addition to the more general information from the viability evaluations in the EIS. Although many commenters express desire to see more of this detail at this time, more detail at this strategic planning level is not necessary to complete Plan revision. Given the large number of species and the site-specific considerations involved, and the likelihood that priorities will shift throughout the life of the Plan as information is obtained, it is appropriate to establish these additional details as part of Plan implementation.

Wildlife Population Management

3-78. Public Concern: The Forest Service should not promote demand species drawn to early successional habitat at the expense of a greater number of species that require mature forests.

BECAUSE THE FOREST SERVICE SINGLES OUT SPECIES FOR SPECIAL ATTENTION THAT ARE ASSOCIATED WITH EARLY-SUCCESSIONAL HABITAT

Response: Demand species were chosen as Management Indicator Species, as indicated in the MIS Process Record document, to indicate the effects of management to meet the hunting demand for these species. Demand for public land hunting opportunities is high in Alabama, and National Forests in Alabama are the largest area of public lands open to hunting in the state. Most of the MIS chosen are not demand species. Most of the MIS chosen are associated with mid-successional, mature, and old seral habitats.

3-79. Public Concern: The Forest Service should manage forests to return wildlife to a natural state with biodiversity.

FOR LONG-TERM FOREST HEALTH

Response: Many commenters expressed a desire to see national forests managed for maintenance and restoration of "natural conditions" to support healthy ecosystems, clean water, and abundant wildlife, as opposed to an emphasis on resource extraction. We feel the revised Plan is in line with these priorities. Within the Southern Appalachian region, vegetation management will be driven by the need to create desired ecological conditions, not to meet resource extraction goals. These Plans clearly focus on the ecological conditions left on the ground, not on resources removed. Although timber production emphasis prescriptions were defined during planning, none have been included under the preferred alternative. All prescriptions used emphasize ecological restoration, recreation, or special area protection.

This emphasis does not mean that there will be no commercial timber sales implemented under the revised Plan. Timber sales are one of the most important and efficient tools we have for creating desired conditions on the ground. To use this tool effectively, in most cases we designate individually which trees are to be cut and which are to be retained, and carefully administer the sale to ensure disturbance to soil, water, and remaining trees is within specified limits. This approach is not only effective, it is efficient: by selling cut trees, we generate revenue rather than paying for the service. An added benefit is that sold material is used and generates economic activity within surrounding communities. However, to repeat, any proposed timber sales must make sense in terms of the on-the-ground condition created as a result.

3-80. Public Concern: The Forest Service should manage forests for ecological diversity.

TO BENEFIT WILDLIFE AND WILDLIFE HABITAT

See response to PC 3-79.

Fisheries and Aquatic Wildlife

Fisheries (Native and Non-Sport)

3-81. Public Concern: The Forest Service should explain why the stocking of non-native aquatic species is needed.

Response: Alabama Department of Conservation and Natural Resources has the authority and responsibility for stocking fish into public waters. The Forest Service participates as a cooperator with the State and only native fish species are stocked in reservoirs and some lakes under Forest Service management. Reasons for stocking are normally to support annual kid's fishing events. Non-native fish are not stocked, and no stocking of game fish occurs within free-flowing streams and rivers. The revised Plan includes an objective for developing and periodically updating lake and reservoir *management plans in coordination with the State and other agencies and partners, and this will be the forum to evaluate the need for fish stocking. The Plan and EIS have been revised to clarify this situation.*

Threatened, Endangered, and Sensitive Species

3-82. Public Concern: The Forest Service should not target the holiday and blueface darters for management actions, as they are not candidate species for listing as threatened and endangered species.

Response: The EIS has been corrected to show that holiday darters are considered a "sensitive" species and blueface darters are indicated as a locally rare species. Both species therefore do not have management actions specified for their recovery but they will benefit from revised Plan direction to conserve sensitive and locally rare species.

3-83. Public Concern: The Forest Service should clarify statements related to the at-risk status of mussels.

Response: The final EIS includes additional discussion and clarification of the potential effects of revised Plan alternatives on mussels and their habitat (sections 3.B.4.0, 3.B.6.2, and 3.B.7.2).

3-84. Public Concern: The Forest Service should specify that it will monitor and protect mussels.

Response: Revised Plan direction includes goals, objectives, and standards that specify that listed and sensitive species will be protected through consideration in all levels of planning, surveys to determine their status, modification of Forest Service activities, and monitoring. Almost all mussels are either federally listed or considered as sensitive species. All mussels would benefit from protective measures aimed at listed and sensitive species. Moreover, forest-wide and riparian direction would protect and restore aquatic habitat qualities important to mussels. As shown in chapters 2 and 5 of the revised Plan, mussel community composition and listed and sensitive mussel species would be monitored for trends in their abundance, distribution, and habitat suitability.

Terrestrial Wildlife and Habitat

General

3-85. Public Concern: The Forest Service should protect wildlife and old growth forests.

Response: Old growth and wildlife protections are discussed in chapters 2 and 3 of the revised Plan.

3-86. Public Concern: The Forest Service should specify details regarding the provision of large, contiguous, forested, and remote areas for wildlife.

Response: At the landscape, or physiographic unit scale, all national forests are considered large, contiguous, forested, and remote areas for wildlife. It is understood that forest management practices are utilized within these large forested areas. An analysis of landscape context and fragmentation was done in Section 9.0 of Chapter 3, Section B of the EIS. Remote character is featured in areas allocated to several prescriptions including Wilderness and Backcountry Prescriptions.

3-87. Public Concern: The Forest Service should increase the total acreage of forest openings.

BECAUSE MAINTAINED OPENINGS ARE IMPORTANT TO MANY WILDLIFE SPECIES

Response: Early-successional habitat was one of the topics most frequently raised by commenters. Early-successional habitats are not all the same in their value to wildlife and in strategies for their management. Types of early-successional habitat that we have addressed include early-successional forests, open woodlands, permanent wildlife openings, and maintained rights-of-way. Percentage objectives within prescriptions, which were the focus of many comments, are for early-successional forest *only.*

The total amount of early seral habitat present and necessary will need to be determined at the project scale as individual projects implementing the revised Plan are analyzed and designed. Chapter 3, Section B, 3.2 provides consideration of permanent, or maintained, openings and rights-of-way. Acres of wildlife openings and forested acres allocated to prescriptions favorable-, neutral-, or detrimental-to expansion of permanent openings are disclosed in Tables 3B.2.2-1 and 3B.2.2-2. Existing acres in permanent openings are often under prescribed levels for common game species. Such prescribed levels are not known for most non-game species. Comments calling for both higher and lower objectives for early-successional habitats were common. Commenters in favor of higher objectives included state wildlife management agencies, wildlife professional organizations, hunting and game species conservation organizations, and bird conservationists. Commenters in favor of lower objectives included environmental organizations and those interested in low intensity management strategies and undisturbed mature forest conditions.

In a recent review paper by disturbance ecologist Craig Lorimer (Historical and ecological roles of disturbance in eastern North American forests: 9,000 years of change. Wildlife Society Bulletin 2001, 29(2):425-439), Lorimer concludes: "Deciding on the optimal amount of early successional habitat on public lands is a complex ecological and social issue that can be guided only in part by scientific evidence." The diversity of perspectives expressed in comments reflects the complexity of this as a social issue. To provide for this diversity of views, as well as a for a diversity of *habitats, we defined four mixes or "options" of successional forest conditions to be assigned to specific portions of the national forest landscape. These options were allocated to the landscape through prescription assignments after considering a variety of factors, including successional habitat abundance and distribution across the forest, settings for other multiple uses, and legal and logistical constraints on management opportunity. We have allocated successional forest options in the Revised Plan in a mix that we feel provides the best balance in meeting the wide range of public desires evident in the comments.*

3-88. Public Concern: The Forest Service should restore large carnivores and other animals, as recommended, where appropriate.

Response: Endeavors such as repatriation, reintroduction, or population augmentation are dictated by the USFWS or the state wildlife management agency by law. In Alabama, the state agency with authority to repatriate wildlife species is Alabama Department of Conservation and Natural Resources, Wildlife and Freshwater Fisheries Division. The National Forests in Alabama have been the beneficiaries of such efforts in the past. Successful reintroduction of deer and turkeys took place early in the 20th century. A ruffed grouse reintroduction was also attempted, but failed, due to edge of range complications. The National Forests in Alabama would be a willing partner in future restoration and repatriation efforts as determined suitable and advisable by the lead regulatory agencies.

Black Bear

3-89. Public Concern: The Forest Service should better protect black bear habitat.

Response: While young male bears are periodically recorded as moving throughout the state, including across several National Forests in Alabama Management Units, the Alabama Black Bear Alliance and Alabama Department of Conservation and Natural Resources, only recognize one resident bear population in Alabama. It is located in the Mobile Basin Delta region in southwestern Alabama. No resident bear populations exist on or near the National Forests in Alabama at this time. However, areas allocated to Riparian, Rare Community, Wilderness, Backcountry, Botanical/Cultural Emphasis, and many other management prescriptions would provide sufficient potential denning sites and hard mast sources to accommodate a significant bear population. Newly regenerated areas of forest would provide excellent soft mast sources. Soft mast is the main bear diet component outside fall/winter periods.

3-90. Public Concern: The Forest Service should state whether black bear habitat is suitable for timber harvest.

Response: Please see the response to the preceding public concern. There are no known populations of black bears anywhere on the National Forests in Alabama at this time. However, it should be noted that the USFWS, in protecting the federally-listed subspecies, Louisiana Black Bears, granted a total exemption to "normal silvicultural practices." In addition, Riparian Prescription protections, along with all of the no-, or low-management prescriptions (See Chapter 3 of the revised Plan for a listing and characterization.) would provide adequate, well-distributed sources for den trees and remote areas. Den trees are often cited as a limiting factor to bear habitats. If bears were present on the National Forests in Alabama, timber harvest would be a permissible management tool within those habitats.

3-91. Public Concern: The Forest Service should specify the status of black bears in the Conecuh National Forest, and all plans regarding black bear management.

Response: It is the responsibility of the USFWS to determine a species' federal status under the Endangered Species Act (ESA). It is the responsibility of the Alabama Department of Conservation and Natural Resources (ADCNR) to determine a species' state status. In Alabama, the black bear is not federally listed. It is state listed as a game animal, with a closed season, allowing no legal harvest of bears in Alabama. Currently, there is only one resident bear population recognized in Alabama. It is in the southwestern portion of the state in the Mobile Delta region.

Non-Game Wildlife

3-92. Public Concern: The Forest Service should protect non-game wildlife.

Response: National Forests in Alabama employ federal law enforcement officers and participate in partnership agreements with Alabama Wildlife and Freshwater Fisheries Conservation Officers, and state and local police to enforce laws and protections extended to non-game wildlife.

Avifauna

3-93. Public Concern: The Forest Service should implement stronger avian monitoring, habitat restoration, objectives, and active management.

FOR TARGETED SPECIES

Response: In order to comply with the provisions of Executive Order 13186, a team of biologists from each of the five Southern Appalachian revision forests (as well as the Daniel Boone National Forest) worked closely with the Migratory Bird Office of the U.S. Fish and Wildlife Service (FWS) to incorporate bird conservation measures in the revised Plan. Please refer to Migratory Bird section, Section 9.0, Chapter 3, Section B, of the

EIS. Cooperation involved reviewing relevant Partners in Flight Bird Conservation Plans and meeting with FWS personnel on multiple occasions to develop and revise recommended management strategies. Management strategies that have been incorporated into the revised Plan include objectives and standards for restoration and maintenance of key habitat conditions, such as early successional forest, mature riparian forest, riparian forests with dense understories, canebrakes, and open pine and oak woodlands, savannas, and grasslands. In fact, much of the vegetation management directed at major forest community types in the revised Plan is driven by bird conservation needs.

Following release of draft Plans and EISs, we met again with FWS personnel to review and discuss proposed revised Plans during the public comment period. Based on this review, the FWS submitted comments to individual forest staffs, in some cases leading to further modifications of revised Plans.

3-94. Public Concern: The Forest Service should conduct habitat restoration to increase herbaceous cover.

FOR VARIOUS AVIAN SPECIES

Response: See response PC 3-93.

Threatened, Endangered, and Sensitive Species

3-95. Public Concern: The Forest Service should protect and restore threatened, endangered, sensitive, and locally rare species and their habitat.

Response: Incorporation of management objectives in the red-cockaded woodpecker R.O.D. and the newly revised recovery plan was a central impetus to Plan revision. Unlike most recovery plans, the RCW revised recovery plan presents specific numerical objectives and timetables for each affected National Forest Unit. Restoration and protection of rare species and underrepresented habitats was a major factor in development of management prescriptions such as the red-cockaded woodpecker (8D) prescriptions, the rare community prescription (9F), the native ecosystem restoration prescriptions (9's), and the Riparian Prescription (11). Chapter 2 of the revised Plan lists the standards and objectives that apply forest-wide regarding the protection of rare species and the restoration of their habitats.

3-96. Public Concern: The Forest Service should implement the threatened and endangered species plan to protect bats.

Response: National Forests in Alabama incorporated direction regarding bats and cave protection from the FWRBE direction document, which was the result of collaboration between USFWS and Forest Service biologists in the SAA planning area. The direction *incorporated into the revised Plan was summarized and presented to USFWS for ESA consultation. Concurrence on the Biological Assessment submitted to USFWS was received on October 28, 2003.*

3-97. Public Concern: The Forest Service should only use gates or fencing as a last option to protect bats.

Response: See response to PC 3-96.

3-98. Public Concern: The Forest Service should revise the plan text based on the revised recovery plan for the red-cockaded woodpecker.

Response: This was done for the Final version of the revised Plan.

3-99. Public Concern: The Forest Service should make the recovery of threatened and endangered species a priority in the forest plan revision.

Response: See response to PC 3-95.

3-100. Public Concern: The Forest Service should specify plans regarding the re-introduction of the red wolf on national forests.

Response: See response to PC 3-88.

3-101. Public Concern: The Forest Service should specify protection for Mitchell's satyr.

Response: A Mitchell's satyr was visually identified on the Oakmulgee Management Unit of the Talladega National Forest, Bibb County, Alabama in June of 2001. However, the taxonomic identity of Alabama's population(s) has not been determined. It could be either subspecies mitchellii or francisci, both of which are federally listed, and the same legal status and protection is afforded to each taxon. Or Alabama's satyr population could be a taxon new to science; then a description of this butterfly will have to be undertaken and a new federal listing process initiated, if deemed appropriate. This is one reason that forest-wide management direction with regard to this species is premature.

The main factors in local extirpation of Mitchell's satyr, wetland alteration, degradation, and destruction through draining and conversion of land use, occurred on surrounding private lands, across the landscape, in the past. These factors are beyond the control of the Forest Service. Secondary factors adversely affecting this species complex can be attributed to the removal and elimination of the disturbance elements that historically created suitable wetland habitat for the satyr. Beaver impoundments that later succeeded into wet herbaceous ecosystems, and herbaceous wetlands occurring in *woodland and savanna complexes maintained by fire, were likely the historic native habitat of satyrs. Widespread beaver eradication and disruption of the natural fire regime allowed natural succession to further reduce suitable habitat. A Forest Supervisor's Closure Order on the collection of butterflies, especially for Mitchell's Satyrs, was enacted on the Oakmulgee Division. Enforcement of this Order aims to protect satyrs from local extirpation due to collection.*

Habitat succession factors are particularly relevant to Alabama populations and may be controlled by purposeful forest management. The revised Plan includes a rare community prescription that would protect many wetland types potentially utilized by satyrs. The Oakmulgee Division is targeted to restore woodlands and savanna complexes, increasing the area and types of wetlands available as potential satyr habitat. The Riparian Prescription, which conserves riparian values in a corridor along open waters, and perennial and intermittent streams, would also afford protection to beaver-influenced wetlands. National Forests in Alabama instituted Streamside Management Zones in 1995, which would be continued under all of the alternatives, to protect ephemeral, intermittent and perennial drainages. The wetlands protected under these management directions would adequately protect known and potential satyr habitats.

Implementation of the Revised Land and Resource Management Plan for the National Forests in Alabama is not likely to adversely affect Mitchell's satyr. Genetic taxonomic identity of Alabama's Mitchell's satyr occurrences has not yet been confirmed. None-the-less, management direction addresses the critical needs for habitat and protection of Mitchell's satyr and should improve or maintain suitable habitats for this species. The possibility for take cannot be completely eliminated with any level of management. Forest-wide standards for riparian and streamside management zone protections should reduce the potential for take to levels that are insignificant and discountable. Additional site-specific analysis would be done on all projects with the potential for affecting this species.

This rationale from the Biological Assessment for NFAL's revised Plan was concurred with by USFWS on October 28, 2003.

3-102. Public Concern: The Forest Service should implement a beaver population/dam management strategy that supports habitat for Mitchell's satyr butterflies.

Response: Please see the response to the preceding public concern statement. Wetlands (beaver-influenced or otherwise) are not usually the target of management. The Riparian Prescription directs the management of these areas to be driven by the protection of riparian associated values. The only exception to this is a forest-wide standard that directs that "Beaver populations and dams will be managed to prevent adverse effects to public safety, facilities, private land resources, and rare *communities." Beaver dams will only be the object of management treatments by NFAL employees under these conditions. Potential habitats for Mitchell's satyrs will be restored or improved by management treatments that favor woodland structure restoration and thereby coastal plain bogs and coastal plain upland pond rare communities.*

3-103. Public Concern: The Forest Service should specify survey requirements for protected, threatened, endangered, threatened, and sensitive species.

BECAUSE LACK OF SURVEY REQUIREMENTS AND THE DROPPING OF SENSITIVE SPECIES IS ARBITRARY

Response: Forest Service Manual direction dictates project-level inventory requirements at 2672.4. This direction was further defined by R8-Supplement 2672.43, which outlines a procedure for determining when project-level inventory for proposed, threatened, endangered, or sensitive species is necessary. Survey requirements for some individual species are required by some recovery plans, once the species is known to utilize the project area. For example, the revised RCW Recovery plan provides standards for several aspects of RCW population and habitat monitoring.

3-104. Public Concern: The Forest Service should comply with direction requiring management and recovery of threatened, endangered, and sensitive species.

Response: See response to PC 3-95.

3-105. Public Concern: The Forest Service should specify which threatened, endangered, and sensitive species require canopy habitat.

Response: Cerulean warblers, a locally rare species, are known to utilize the Bankhead management unit, in areas of forest with well-developed canopy layers. This species was recently considered for federal listing, however it is currently not federally listed, nor a Regional Forester's Sensitive Species. None of the terrestrial vertebrate or aquatic federally listed or Regional Forester's Sensitive species are recognized as requiring canopy habitat.

Locally Rare Species

3-106. Public Concern: The Forest Service should specify all state-listed plants and animals, and consider the effects of management actions on these species.

Response: This Public Concern was primarily generated by specific state agencies requesting that the species on their state lists be included in the viability evaluation.

The National Forests in Alabama was not one of the forests generating this response. NFAL included all those species on Alabama state lists that were relevant to NFAL management units as of local viability concern and it coordinated with employees of state agencies and NGO's in determining the viability species list.

TO INCLUDE COAL SKINKS

Response: Some comments indicate that coal skink, a locally rare species, was omitted from viability analysis or that protection of its habitats is insufficient to maintain its viability. The coal skink is included in the database provided by NatureServe for use in viability analysis for the Southern Appalachians. It shows up in viability analysis results for three of the five Southern Appalachian forest undergoing revision (Cherokee and Chattahoochee National Forests, and National Forests in Alabama). It does not show up in viability results for the Jefferson and Sumter National Forests because populations of this species have not been confirmed on these forests. The database indicates this species is only "possibly" present on these forests.

The database and associated references provided by NatureServe indicate this species is associated with a wide range of forest communities, but is most common in areas with abundant downed wood and leaf litter near water. For analysis purposes, we have associated this species with the downed wood and mature riparian forest habitat elements. Analysis indicates these habitat elements generally will remain common under the preferred alternative and have a low likelihood of limiting associated species. Viability risk, therefore, is primarily driven by species rarity. This fact indicates consideration of effects to known occurrences during project planning, where appropriate, will be important for maintaining species viability.

3-107. Public Concern: The Forest Service should conduct full surveys and inventories of species and their habitats sufficient to ensure viability.

BECAUSE THERE ARE NO ANALYSIS AND EXPLANATION OR JUSTIFICATION FOR INCLUDING OR EXCLUDING SPECIES IN RARE SPECIES MONITORING PROGRAMS

Response: Some commenters expressed satisfaction that viability evaluations have identified species and habitats most at risk, leading to appropriate attention to conservation of the most threatened habitats and communities. Other commenters pointed to the need for additional "fine-filter" considerations to provide for species viability. Most of these commenters focused on the need for more specificity regarding inventory and monitoring of species of viability concern, including those of local viability concern ("locally rare" species). We agree that inventory and monitoring are critical and necessary components of a program to provide for species viability. The issue is where in the overall planning process the details of these components are considered and documented.

Because of the incredible diversity of species on the forest monitoring populations of every species of potential viability concern is not feasible. Practical monitoring *programs must combine monitoring of habitat conditions, populations of indicator species, and populations of priority viability concern species. This combination is reflected in the Revised Plan's monitoring chapter, which includes monitoring questions that cover all of these elements. The Monitoring Summary Table in Appendix F of the Revised Plan provides more specifics on relevant elements to be monitored. Task sheets, to be used for implementing the monitoring program, provide additional detail, and are available upon request. In addition, Task 42 in the Monitoring Summary Table indicates additional inventory and monitoring of viability concern species (including "locally rare" species, where appropriate) will occur based on prioritization developed and revised during Plan implementation. Prioritization will involve use of more site-specific information on species occurrences, in addition to the more general information from the viability evaluations in the EIS. Although many commenters express desire to see more of this detail at this time, more detail at this strategic planning level is not necessary to complete Plan revision. Given the large number of species and the site-specific considerations involved, and the likelihood that priorities will shift throughout the life of the Plan as information is obtained, it is appropriate to establish these additional details as part of Plan implementation.*

BECAUSE THE FOREST SERVICE HAS NOT CONDUCTED NECESSARY SURVEYS AND INVENTORIES

BECAUSE THE FOREST SERVICE HAS PROVIDED NO POPULATION MONITORING DATA OR ANALYSIS TO DOCUMENT THAT SPECIES WILL BE MAINTAINED

Response: Some comments contend the species viability evaluation places too much emphasis on habitat as opposed to population parameters, and that the existing information on species populations is inadequate to support the effects analysis. As described in the EIS section on Terrestrial Species Viability Evaluation, use of detailed demographic analysis to evaluate population viability is not feasible for the large number of species considered. Therefore, our goal is to use a clearly defined, transparent process to identify species for which there are substantive risks to maintenance of viable populations, and to ensure consideration of appropriate habitat management strategies to reduce those risks to acceptable levels where feasible. This goal applies equally well to the aquatic species viability evaluation. Both aquatic and terrestrial viability evaluations use information on habitat and populations of individual species to assess viability risks. The terrestrial viability evaluation used population abundance in the form of F Ranks as input to viability risk assessment. The aquatic viability evaluation used distribution of populations by watershed and the relationship of watershed disturbance to populations of environmentally sensitive species to assess viability risk. We feel the level of population information used in the analysis is appropriate for the broad-scale strategic planning represented by forest planning.

BECAUSE HABITAT DATA IS AN UNSUITABLE SURROGATE FOR POPULATION DATA

BECAUSE THE USE OF HABITAT DATA AS A SURROGATE HAS BEEN DISCOUNTED BY THE FEDERAL JUDICIARY

Response: Some commenters fault viability evaluation for using habitat as a surrogate for population information, and contend the viability analysis is inappropriately based on the assumption that all suitable habitat is occupied. As discussed in other responses under this Public Concern statement, viability evaluations use both population and habitat information to assess viability risk. Habitat is not used as a surrogate for population information, nor is there an assumption that all suitable habitat is occupied. Even when habitat is not likely to be limiting, risk to viability may still be high because of population rarity.

BECAUSE THE VIABILITY ANALYSES IS BASED ENTIRELY ON NATIONAL FOREST LANDS AND IGNORES ALL OTHER LAND OWNERSHIP ACTIVITIES AND THEIR DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

Response: Some comments contend that cumulative effects to species viability are inadequate because only national forest land is considered. This contention is inaccurate. Aquatic species viability evaluation clearly analyzed entire watersheds, including private land conditions, as part of viability risk assessments. In the terrestrial species viability evaluation, the habitat distribution variable explicitly incorporates consideration of conditions on intermixed private lands.

BECAUSE OF THE USE OF EXPERT JUDGMENT AND ARBITRARY APPROACHES AND DECISIONS

Response: Although formal peer review of completed viability evaluations were not conducted, elements of external review and adjustment were incorporated throughout the viability evaluation process. For the terrestrial viability evaluation, basic information on species status, habitat relationships, and threats was obtained through an agreement with NatureServe, leading to involvement of a large number of experts from state agencies and academia. Habitat Association Reports, which served as the basis for many management recommendations, were subject to peer review. Later, recommended Plan language was reviewed by both endangered species and migratory bird staffs of the US Fish and Wildlife Service. The aquatic viability evaluation process was in large part developed by scientists from The University of Georgia. During the comment period on the DEIS, we solicited process reviews of both the terrestrial and aquatic viability analyses by Forest Service research scientists, who assessed the evaluations for consistency with best science (record of these reviews are available on request).

Some comments contend that the terrestrial viability evaluation needs peer review because too many steps in the process depend on expert judgments. Three primary variables drive the viability risk assessment: current species abundance, expected future habitat abundance, and expected future habitat distribution. Current species abundance, or F Ranks, were developed by external experts, reviewed by Forest Service biologists, and negotiated where differences in data or opinion occurred. Therefore, this variable has been through a rigorous review process. Expert judgment was often involved in assigning habitat variables to broad categories. However, all of these variables were combined in the evaluation in a transparent and mechanical way so that their contributions assessed viability risk is obvious.

BECAUSE ACTUAL POPULATION DATA IS REQUIRED

THE FS HAS NOT PROVIDED THE INFORMATION ABOUT EACH MIS THAT ITS OWN REGULATIONS REQUIRE. FOR EACH MIS, THE FS SHOULD HAVE IDENTIFIED THE EXISTING NATIVE AND DESIRED NON-NATIVE VERTEBRATE SPECIES IN THE PLANNING AREA, MINIMUM NUMBER OF REPRODUCTIVE INDIVIDUALS OF THE MIS, AND THE SPECIFIC HABITAT REQUIREMENTS FOR EACH MIS. 36 C.F.R. [SECTION] 219.19 (1990). ALL OF THIS IS ESSENTIAL TO ESTABLISHING A BASELINE FROM WHICH CHANGES IN THE MIS POPULATION AND ITS INTERACTIONS WITH ITS ENVIRONMENT CAN BE MEASURED. WITHOUT THIS INFORMATION, IT IS VERY DIFFICULT FOR THE FS TO STATE THE REASONS THAT PARTICULAR MIS

Response: The revised Plan includes provisions for monitoring populations of management indicator species (see Chapter 5). The approach to MIS selection and monitoring used in the revised Plan is designed to keep population monitoring meaningful, feasible, and in compliance with relevant statute, regulation and case law, including recent court rulings. See also the response to Public Concern 3-111.

BECAUSE THE STRATEGY FOR VIABILITY ANALYSIS IS DESIGNED TO GET AROUND SIERRA CLUB V. MARTIN

BECAUSE MONITORING PLANS AND ASSUMPTIONS ARE BASED ON AN UNPROVEN THEORY

BECAUSE MONITORING THAT LACKS SCIENTIFIC BASIS VIOLATES NEPA AND IS ARBITRARY AND CAPRICIOUS

Response: Some comments contend the species viability evaluation places too much emphasis on habitat as opposed to population parameters, and that the existing information on species populations are inadequate to support the effects analysis. As described in the EIS section on Terrestrial Species Viability Evaluation, use of detailed demographic analysis to evaluate population viability is not feasible for the large number of species considered. Therefore, our goal is to use a clearly defined, transparent process to identify species for which there are substantive risks to maintenance of viable populations, and to ensure consideration of appropriate habitat management strategies to reduce those risks to acceptable levels where feasible. This goal applies equally well to the aquatic species viability evaluation. Both aquatic and terrestrial viability evaluations use information on habitat and populations of individual species to assess viability risks. The terrestrial viability evaluation used population abundance in the form of F Ranks as input to viability risk assessment. The aquatic viability evaluation used distribution of populations by watershed and the relationship of watershed disturbance to populations of environmentally sensitive species to assess viability risk. We feel the level of population information used in the analysis is appropriate for the broad-scale strategic planning represented by forest planning.

3-108. Public Concern: The Forest Service should identify the impact of increased sediment on species in light of the increases from all sources in the watershed.

BECAUSE MINOR INCREASES IN SEDIMENT COULD CREATE SIGNIFICANT CUMULATIVE EFFECTS TO DISTRESSED, NON-PRODUCING POPULATIONS

Response: The effect of increased sediment from all sources in the watershed on aquatic species was considered in the sediment and viability models.

3-109. Public Concern: The Forest Service should build a fine filter species monitoring program, and disregard the existing coarse filter viability analyses.

BECAUSE EXPERT JUDGMENTS WERE USED

BECAUSE EXPERT JUDGMENTS WERE INFORMED BY SPECTRUM WHICH DOES NOT ACCURATELY MODEL THE DYNAMICS OF SOUTHERN APPALACHIAN FORESTS

BECAUSE SPECIES ASSIGNMENTS AND METHODOLOGIES WERE SUPPOSED TO BE REVIEWED BY A PANEL OF SCIENTISTS

BECAUSE THE HABITAT ANALYSIS IS BASED ON QUESTIONABLE HABITAT MODELING AND EDUCATED GUESSES

BECAUSE DATA BY QUENTIN BASS IS NOT REFERENCED

BECAUSE THE PLANS FAIL TO ESTABLISH FINE FILTER MONITORING

BECAUSE THERE ARE NO GUIDELINES TO ADDRESS LOCALLY RARE SPECIES, MANY OF WHICH HAVE HIGH VIABILITY CONCERNS

BECAUSE THE PLAN FAILS TO PROVIDE STANDARDS FOR THREATENED, ENDANGERED, SENSITIVE, AND LOCALLY RARE SPECIES

Response: See response to PC 3-107.

3-110. Public Concern: The Forest Service should establish goals, objectives, and standards for monitoring threatened, endangered, sensitive, and locally rare (TESLR) species.

Response: See responses to PC 3-95 and PC 3-77.

Management Indicator Species

3-111. Public Concern: The Forest Service should specify numerous management indicator species, including plants, aquatic life, insects, fish, birds, and particularly, salamanders.

TO STUDY FOREST HEALTH AND COMPLY WITH LAWS

BECAUSE THE FORESTS ARE SUBJECTED TO HEAVY USE AND RISKS FROM PESTS AND DISEASES

INCLUDING WATER ANIMALS AND PLANTS

Response: Several comments indicate that reasons for selection of MIS are not given, and that selected MIS are not adequate to meet legal requirements. Reasons for selection of MIS are documented briefly in Chapter 5 of the revised Plan and in the sections of the EIS relevant to each MIS. More detailed rationale for MIS selection is *found in the Management Indicator Species Selection Process Record, which is found in EIS, Appendix B: Analysis Process. This record documents a selection process that is designed to follow closely the MIS requirements in 36 CRF 219.19 (1982 version). Species were considered for selection under each of the five categories listed in 36 CFR 219.19(1), and selected where appropriate. Two primary criteria were used to judge appropriateness of a species as MIS: 1) changes in the species' population should primarily reflect the effects of national forest management activities, and 2) population trends of the species must be capable of being effectively and efficiently monitored and evaluated in terms of habitat changes.*

Finding species that meet these criteria is more difficult than it might first appear, especially in light of current scientific understanding. When regulations were adopted in the early 1980s, use of MIS was deemed the best approach for addressing biological diversity. Today, their use as the sole or primary means of planning and evaluating biological diversity is overly simplistic. A tremendous amount of research and scientific publication has occurred over the past twenty years, giving us much greater insight into ecological interactions and ecosystem functions. We now have a much greater appreciation for the complexity of population responses, and the limitations of using one species as a "proxy" for whole communities (see literature cited in the MIS Selection Process Record). We also are more aware of the inherent difficulties in precisely monitoring populations of many species.

As a result, we have reduced our emphasis on MIS during this round of planning, while staying in compliance with both the letter and intent of related regulations. At the same time, we have greatly increased emphasis on consideration of viability of many more individual species, and incorporated use of ecologically-based vegetation classification systems, newly developed by The Nature Conservancy and NatureServe. Use of this classification system includes recognizing and protecting rare community types. In addition, rather than focusing on a handful of individual species, our monitoring programs have increased emphasis on monitoring species groups and communities, such as birds, plants, and rare communities, because this approach will give us much better information on more species and on overall system function. Where appropriate, individual species also will be monitored. We also will continue to work with our partners in Forest Service Research and at universities to encourage and support research on key biological issues that are too complex to be addressed through our monitoring programs.

This shift in emphasis reflects our understanding of the current state of science, and an increased commitment to biological conservation, not, as some comments suggest, an attempt to avoid these issues.

Other comments contend that selected MIS are not adequate to represent all species or potential management effects as needed to provide for species viability and forest health and diversity. Of the five categories of MIS listed in the regulations, only one *category is to be selected because they are believed "to indicate effects of management activities on other species of selected biological communities…" (36 CFR 219.19(1)). The purpose of other categories of MIS are to focus attention on effects of management on T&E recovery, species with special habitat needs "that may be influenced significantly" by management, and meeting public demand for game and non-game species. The MIS Selection Process Record clearly documents our consideration of species under each of these categories.*

Based on these five categories, it is clear that not all MIS are to serve as "proxies" for other species; some are of direct interest themselves. Regulations make no direct link between species viability requirements and MIS. Use of MIS as the sole or primary means of assessing viability risk is not consistent with best science, as documented in literature cited in the MIS Selection Process Record. We have made no effort to select MIS to represent <u>all</u> species or all management effects, nor is there a requirement for us to do so. As indicated above, species viability requirements have been addressed primarily through direct evaluation of all species of viability concern and a mix of monitoring strategies.

3-112. Public Concern: The Forest Service should include aquatic species as management indicator species.

TO EVALUATE THE EFFECTS OF TIMBER HARVEST AND ROADS

TO EVALUATE THE EFFECTS OF FORESTRY AND AGRICULTURE

Response: Rationale for not selecting individual aquatic species as management indicators is documented in the Management Indicator Species Selection Process Record (Appendix B). This rationale centers on the fact that monitoring data for individual species may be highly variable over space and time for reasons that may be difficult to tie to watershed health and management effects. Scientifically, it is much more meaningful to look at whole fish communities for trends in composition. This monitoring involves collecting data on all species in the community, but is not set up to make inferences based solely on the trends of one or a few species. This approach provides more power for assessing conditions, and reflects use of the best current science. The revised plan (Monitoring Summary Table, revised Plan, Appendix F) indicates our intent to monitor fish communities as part of monitoring watershed condition. The revised plan also indicates our intent to monitor aquatic threatened and endangered species (Monitoring Summary Table, revised Plan, Appendix F).

3-113. Public Concern: The Forest Service should designate one or more aquatic species as management indicator species.

PARTICULARLY IN THE CAHABA, BLACK WARRIOR, AND LOWER COOSA WATERSHEDS, WHICH SHOULD ALSO BE DESIGNATED AS WATERSHED RESTORATION OR AQUATIC HABITAT AREAS

Response: See response to PC 3-112.

3-114. Public Concern: The Forest Service should consider a reasonable range of alternatives for proposed endangered, threatened, and sensitive species as management indicator species.

Response: Threatened, endangered, or sensitive species selected as MIS should have population levels that are directly tied to effects of national forest management. Most TES species are managed through protective measures alone, and are affected mainly by their past distribution limitations. Red-cockaded woodpeckers, an exception to this profile, are directly benefited by vegetation treatments performed on national forests.

3-115. Public Concern: The Forest Service should not use deer and turkey as management indicator species.

Response: Deer and turkey were included as management indicator species because they are game animals that are in demand from recreationists for consumptive use and for non-consumptive wildlife viewing. They do not represent a particular forest type or habitat structure, but rather they will be used as indicators of our ability to provide them at desired levels.

3-116. Public Concern: The Forest Service should include management indicator species that require early successional habitat.

TO DETERMINE POPULATION TRENDS BY ALTERNATIVE

Response: The prairie warbler is selected as the most appropriate MIS to represent early-successional forests.

3-117. Public Concern: The Forest Service should not use habitat types as indicators for species viability.

BECAUSE A MIX OF SUCCESSIONAL HABITAT DOES LESS WELL FOR SPECIES THAT NEED MATURE FORESTS

BECAUSE STATEMENTS ABOUT HABITAT ELEMENTS WITH THE HIGHEST RISK SPECIES ARE NOT SUPPORTED BY SPECIES/HABITAT RELATIONSHIP TABLES

Response: Comments suggest that we should use management indicator species (MIS), rather than habitat, to drive viability evaluation, and that the set of selected Management Indicator Species (MIS) are inadequate to represent all species of viability concern. Use of indicator species as the sole or primary means of assessing viability risk is not consistent with best science, as documented in literature cited in the MIS Selection Process Record. Indicator species are but one part of our biological monitoring and evaluation program. We have made no effort to select MIS to represent all species of viability concern, nor is there a requirement for us to do so. MIS, as described in 36 CFR 219.19, serve a variety of purposes during forest planning, not all of which are relevant to species viability. Only where appropriate are MIS selected for *the Revised Plan "because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities" (36 CFR 219.19 (1)). Reasons for selection of MIS are documented in Chapter 5 of the revised Plan, in the relevant sections of the EIS, and in the Management Indicator Species Selection Process Record, which is in Appendix B. Some commenters correctly noted that we have de-emphasized the role of MIS in viability analysis. We have reduced emphasis on MIS because of the current state of science, which calls into question many traditional uses of the indicator species concept (see MIS Selection Process Record for a brief review). Nevertheless, our selection and use of MIS in this Plan revision meets both the letter and intent of regulations.*

3-118. Public Concern: The Forest Service should provide more information and discussion of Proposed, Endangered, Threatened, or Sensitive aquatic species; and impacts and recovery plans for them.

Response: Effects to all proposed, endangered, threatened, and sensitive aquatic species have been analyzed and documented. All have been included in species viability analysis, EIS Chapter 3b. In addition, all federally listed species have been addressed in a Biological Assessment that is being coordinated through the US Fish and Wildlife Service, which is responsible for coordinating species recovery. They will have concurred with conclusions of this assessment prior to our signing a decision on the revised plan. Sensitive species have been the subject of additional analysis, which is documented in the Biological Evaluation. Additional analysis of specific impacts to these species will be conducted as part of site-specific project planning.

3-119. Public Concern: The Forest Service should include a discussion of the indigo snake in the Threatened and Endangered species section.

Response: The indigo snake is discussed in the EIS Chapter 3b, as well as in the BA.

3-120. Public Concern: The Forest Service should adopt the entire group of salamanders as management indicator species.

BECAUSE SALAMANDERS ARE EXCELLENT INDICATORS OF FOREST HEALTH

Response: Comments suggest salamanders should be selected as MIS, and they cite literature from scientific journals that support the appropriateness of salamanders as MIS. We have reviewed this literature and recognize the validity of the general points presented. However, other evidence from the scientific literature highlights inherent difficulties in monitoring trends of salamander populations. Based on a study of salamander monitoring methods conducted in the Great Smoky Mountains National Park, Hyde and Simons (2001). Sampling plethodontid salamanders: sources of variability. Journal of Wildlife Management (65(4):624-632.) concluded "[t]he extreme variation inherent in all the methods we examined (CV > 100%) severely limits their *utility for population monitoring" and "[t]he feasibility of monitoring terrestrial salamander populations over large geographic areas using current methodologies remains suspect." They also state "the development of reliable sampling methods…is essential before extensive monitoring programs are established." In addition, selecting salamanders as a group, as some comments suggest, is overly simplistic. According to Hyde and Simons, "[b] ecause spatial and temporal patterns of distribution and abundance are species-specific, salamander population data should be considered on a species-by-species basis." Our MIS Selection Process Record cites this study as a supporting reason for not selecting salamanders as MIS. We have amended our process record to reflect the diversity of opinion in the scientific literature, but until some of the uncertainties related to monitoring methods are worked out, we do not believe it wise to select salamanders as MIS.*

It should be noted that not selecting salamanders as MIS does not mean they are to be ignored. Several salamanders have been analyzed as species of viability concern. Status of their habitats and/or populations will be monitored during Plan implementation (see Monitoring Summary Table, revised Plan, Appendix F). In addition, general effects of management activities on salamander populations have been well documented in the scientific literature. Management actions (such as overstory removal and prescribed burning) that result in drying of litter and upper soil layers is detrimental to most salamanders and their habitats. The revised Plan includes strategies for maintaining moist-soil habitats, such as emphasizing mature forests in riparian corridors, and protecting seeps, springs, bogs, fens, seasonal ponds, and prime coves as rare communities. A relatively small proportion of mesic sites are expected to be negatively impacted from management activity, while the majority of these sites are expected to continue to age and improve in quality.

3-121. Public Concern: The Forest Service should list the flattened musk turtle as a management indicator specie.

Response: Most reptiles do not meet the criteria of appropriate management indicator species because they often require a sampling effort beyond our current capability. The flattened musk turtle is particularly problematic as it is a highly secretive species that appears to be susceptible to diseases that could be transmitted during handling. Our inability to count them with precision makes inferences on relationships between population trends, habitat changes, and management actions unreliable and difficult. Currently, researchers are conducting detailed flattened musk turtle studies in order to better understand their population status and habitat requirements. As a federally listed species, the flattened musk turtle will be periodically monitored to the extent that it does not adversely affect individuals or populations. At this point, however, the inherent limitations to monitoring flattened musk turtles make them ineffective as a management indicator species.

3-122. Public Concern: The Forest Service should monitor communities of species.

BECAUSE MONITORING COMMUNITIES WILL BE A BETTER GAUGE OF HEALTH AND VARIABILITY

Response: See response to PC 3-111.

3-123. Public Concern: The Forest Service should not use the same management indicator species for all alternatives.

BECAUSE EACH ALTERNATIVE IS SUPPOSED TO REPRESENT DIFFERENT MANAGEMENT REGIMES AND OBJECTIVES

Response: Regulations related to MIS state: "Planning alternatives shall be stated and evaluated in terms of both amount and quality of habitat and of animal population trends of the management indicator species" (36 CFR 219.19(2)). MIS are not actions or outputs, the variables that typically vary by alternative. They are planning tools, used to "indicate" management effects by alternative. Changing MIS with each alternative would greatly reduce our ability to use them to compare and contrast effects across alternatives, and is not consistent with our reading of regulation intent.

3-124. Public Concern: The Forest Service should not use common species and community level monitoring as (or in lieu of) management indicator species.

BECAUSE THERE IS NO SCIENTIFIC SUPPORT FOR THIS APPROACH

BECAUSE MANAGEMENT INDICATOR SPECIES ARE SUPPOSED TO INCLUDE SPECIES WITH SPECIAL HABITAT NEEDS, THREATENED AND ENDANGERED SPECIES, AND NON-GAME SPECIES OF INTEREST

TO COMPLY WITH REGULATIONS AND PROVIDE FOR ACCOUNTABILITY

BECAUSE A COMMUNITY APPROACH MAY MISS DECLINES IN ONE OR MORE OF THE SPECIES

Response: See response to PC 3-111.

3-125. Public Concern: The Forest Service should provide explanation and documentation for the elimination and reduction of management indicator species, and the selection of management indicator species and monitoring methodologies.

BECAUSE THE PROPOSED APPROACH VIOLATES NEPA

BECAUSE THE PROPOSED APPROACH VIOLATES THE NATIONAL FOREST MANAGEMENT ACT

Response: Please see the response to Public Concern Statement 3-99. Expected effects to amount and quality of habitat and to MIS population trends are analyzed and disclosed under the appropriate sections of the EIS, in compliance with both NEPA and NFMA.

3-126. Public Concern: The Forest Service should collaborate with universities in identifying and monitoring management indicator species.

TO OFFSET COSTS

Response: See response to PC 3-111.

Forested Vegetation

Forest Vegetation–General

3-127. Public Concern: The Forest Service should explain the reasoning for additional old growth on National Forest System lands.

Response: As the commenter suggests, oak decline is a forest health issue and is discussed in Chapter 3b of the EIS. However, the Forest Service has identified old growth as an important issue both internally and with the public, accordingly the plan provides for the identification, protection and management of old growth.

3-128. Public Concern: The Forest Service should acknowledge that the classification used for major forest communities is a generalization.

Response: One commenter suggests that we make clear that the classification of major forest communities used in the terrestrial species viability evaluation is a generalization so that the limitations of the classification are apparent, and that the classification used is of little use as a screen for viability concern species. All classification systems are generalizations. To plan for habitats, the continuum of conditions on the ground must be generalized into a classification system so that they may be analyzed. For the terrestrial species viability evaluation, we looked at a variety of forest community classification systems, including the Forest Services CISC data classification, NatureServe's vegetation classification, and the classification system developed for old growth planning. While each of these has its advantages, none exactly matched the habitat association groupings that were most apparent when we looked at the full set of habitat needs for each species of potential viability concern. To facilitate and simplify species viability analysis, we lumped some forest communities together, where keeping them separate did not add appreciably to our ability to focus management direction or analysis. Major forest communities used in the viability analysis are defined and cross-walked to other classification systems at the beginning of each associated forest community section in the EIS. The commenter does not specify where they feel this lumping has resulted in erroneous or misleading conclusions.

Woody Debris

3-129. Public Concern: The Forest Service should provide for the protection and recruitment of large woody debris by retaining all trees within one site potential tree height of a stream.

BECAUSE LARGE WOODY DEBRIS PROVIDES HABITAT AND COVER FOR AQUATIC AND TERRESTRIAL SPECIES

BECAUSE LARGE WOODY DEBRIS CONTRIBUTES TO NUTRIENT CYCLING

BECAUSE LARGE WOODY DEBRIS CREATES STRUCTURE IN STREAMS AND PREVENTS EROSION

BECAUSE THE HEIGHT OF A SITE POTENTIAL TREE EXCEEDS 75 FEET, WHICH IS WIDER THAN MINIMUM BUFFER WIDTHS

Response: Riparian areas are managed for the recruitment and retention of large woody debris. Specific large woody debris needs are determined on the basis of stream characteristics. See Riparian corridor prescription.

3-130. Public Concern: The Forest Service should protect and recruit large woody debris as an important component of forested environments.

Response: Riparian areas are managed for the recruitment and retention of large woody debris. Specific large woody debris needs are determined on the basis of stream characteristics. See Riparian corridor prescription.

Management Prescriptions

3-131. Public Concern: The Forest Service should provide standards and guidelines for Management Prescription 9.G.

Response: The full description of management prescription 9.G including standards has been added to the final.

3-132. Public Concern: The Forest Service should modify various management prescriptions used in the Alabama National Forests.

Response: Thank you for your comment.

Quentin Bass Material

3-133. Public Concern: The Forest Service should acknowledge the Quentin Bass material in the Forest Plan revision process.

Response: Several commenters questioned the appropriateness of the even-aged successional model inherent in the Successional Forest Options incorporated in the Revised Plan. They frequently cited materials raised by a forest specialist that contend *that Southern Appalachian forests are naturally uneven-aged, and regenerate predominately through "gap-phase dynamics" rather than by larger, more severe disturbances. Some commenters fault the Forest Service for not considering this information.*

Contrary to assertions made by some commenters, information compiled by the specialist was considered during planning. It was distributed to staffs of all Southern Appalachian forests undergoing revision, and was reviewed by planners at the forest and regional levels. Points of agreement and disagreement were discussed at varying levels across these forests. There are many points of agreement, which are corroborated by a predominance of mainstream scientific literature. We agree that some major forest types in the Southern Appalachians are low disturbance systems that commonly regenerate through natural development of relatively small canopy gaps, and that frequent fire in these systems is not desirable. These areas of agreement are incorporated in the Revised Plan and EIS through direction and analysis for mesic deciduous forests, which include cove, riparian, mixed mesophytic and northern hardwood forests. This direction and analysis considers the amount of these forests allocated to Forest Successional Options 1 and 2 (which should be dominated by gap-phase processes), the need for canopy gaps within these forests, and the limited role of fire (cite Mesic Deciduous Forest Section of EIS, and appropriate objectives and standards from the Plan). There are, however, some conclusions with which we disagree, as do some members of the academic and research communities with whom we have consulted.

The specialist's presentation of forest conditions in the late 1800s and early 1900s depends heavily upon the Ashe and Ayers Report, and descriptions contained in the field notes and maps of the tracts of land that were acquired for inclusion in the National Forests. He also has provided substantive literature (bibliography) to support his views. However, he rejects or ignores the substantial body of scientific literature (much of it published in the last 10 years) that contradicts his conclusions regarding the role of fire and other disturbance in maintaining upland oak and pine forest types.

Unlike the scientific literature used and cited during planning, the specialist's analysis has not been through the rigorous process of peer review, critique, and publication in mainstream scientific journals. The Forest Service contracted review of the specialist's analysis by Paul and Hazel Delcourt of the University of Tennessee, who have published widely on historical disturbance ecology. Their written review indicates areas of agreement and disagreement similar to those identified by forest planning teams. It also is important to note that the specialist is not an ecologist or forester, professions that are educated and trained to make ecological interpretations of forest condition data. In his paper, use of terms, lack of reference to the most current scientific literature, and resulting conclusions often do not reflect the best available science. Based on these considerations, we believe the analysis was given an appropriate level of consideration during planning.

Although understanding historical and pre-European settlement conditions provides an important context for conservation planning, restoring such conditions is not an overriding objective or legal requirement for Plan revision. In most cases, ecological conditions have changed too much for this to be feasible, let alone desirable. Plan direction represents a decision on multiple-use management informed by the best science on disturbance ecology, not an attempt to recreate historical conditions.

Based on synthesis of the scientific literature, our understanding is that Southern Appalachian forests historically have been subject to highly variable disturbance regimes across the landscape. This variation resulted from the interaction of fire, wind, and other disturbance factors with the highly variable topography and edaphic conditions of the mountains. We disagree with the specialist, and follow most current scientific literature, in recognizing that fire, primarily of Native American origin, played an important role in maintenance of upland pine and oak forests, and open woodlands, savannas, and grasslands. Compared to today, forest structure was likely more open on upland sites, due to the influence of fire, and more heterogeneous on lower slopes and coves, due to gap-phase dynamics of older forests. Overall, within-stand structures were likely variable due to the variable effects of natural disturbance factors. Many areas would not easily be categorized as either even-aged or uneven-aged, but some level and pattern of older residual overstory trees would almost always be present, even in areas providing important early-successional habitat. This variable structure can be approximated with uneven-aged, two-aged, and even traditional even-aged management systems, all of which involve retention of varying levels of overstory structure. A patchwork of uniform even-aged stands established by clean clearcuts is clearly outside the historical range of variation of forest structure and is also clearly not the desired condition for any portion of the national forest.

Although the Revised Plan includes objectives for restoration of native fire-maintained habitats, we recognize that we will not be able to restore the influence of fire to the landscape to historical levels due to a variety of logistical and social reasons. Creation of early-successional forests can compensate for the loss of open fire-maintained habitats for some species. So, although we recognize that the mix of types of early-successional habitats maintained under the Revised Plan cannot reflect historical conditions, we have considered the overall abundance of these habitats within an historical ecological context to arrive at objective levels. As some of these fire-maintained habitats are restored, need for early-successional forest as habitat for some species will decline. However, need will not disappear; other species, such as ruffed grouse, depend upon the dense woody growth found in early-successional forests. In addition, other multiple-use considerations, such as need for habitat to support game species for recreation, ecological restoration of native forests, forest health considerations, will continue to make creation of some level of early-successional forest desirable.

Botanical Resources

Threatened, Endangered, and Sensitive Plant Species

Rare Communities

3-134. Public Concern: The Forest Service should protect or restore rare communities.

AND DISTINGUISH BETWEEN "RESTORE" AND "EXPAND"

Response: Several commenters compared provisions for rare communities across forests and found differences. Concerns include lack of delineation of rare communities and allocation of specific acreage to the Rare Community Prescription, and uncertainty about when, where, and how rare communities would be inventoried, delineated, and allocated. Despite some differences that have resulted as regional recommendations were incorporated into individual Plans, each revised Plan includes language that makes clear our intent with regard to rare communities. Our intent is that rare communities, as defined in each Plan, will be given high priority for maintenance and restoration wherever they occur on the forest. To accomplish this intent, it is clear that we will need to improve our inventories of rare communities as the Plan is implemented. We will improve rare community inventories through a variety of approaches, including project-level surveys where needed to ensure maintenance or restoration of rare communities. As rare communities are located and mapped, they will automatically be allocated to the Rare Community prescription, unless or until such allocation would result in a substantial impact to achievement of conditions and outputs envisioned in the Plan. The Plan indicates that rare communities will be monitored for number and acreage of occurrence, condition (which includes presence of rare species), management needs, and management accomplishments. This focus will ensure that rare communities continue to make a critical contribution to community and species diversity on the forest. It is expected that restoration management activities will expand the number and distribution of some rare communities, and that restoration activities will improve the condition of some known rare community sites.

3-135. Public Concern: The Forest Service should provide guidance that specifies how areas will be delineated and reassigned to Management Prescription 9.F, Rare Communities.

Response: See response to PC 3-134.

3-136. Public Concern: The Forest Service clearly delineate rare communities and allocation; provide specific direction for restoration; establish standards for monitoring, maintaining records, and surveying;

identify and protect all special areas; and, establish goals, objectives, and standards for special areas and rare communities.

TO ESTABLISH CONSISTENCY ACROSS FORESTS

Response: See response to PC 3-134.

3-137. Public Concern: The Forest Service should specify guidance and standards for rare communities, how areas will be reassigned to Prescription 9.F prescriptions, and when this will occur.

Response: See response to PC 3-134.

3-138. Public Concern: The Forest Service should protect species occurrences that fall within general forest areas outside rare communities.

BECAUSE 25 PERCENT OF VIABILITY CONCERNS FALL OUTSIDE RARE COMMUNITIES

Response: Commenters focused on the need to identify and protect, maintain, or enhance locations where viability concern species occur, especially when these occurrences are outside of areas targeted for optimal protection and management (e.g., rare communities). They argue that maintaining or enhancing these occurrences is necessary to provide for species viability. We agree. This issue also is a question of where in the overall planning process such consideration should occur. Site protection is generally considered and provided at the project level through site-specific environmental analysis. In addition, known locations of viability concern species can be used during Plan implementation to select sites for projects designed to maintain or restore important habitats. Because of their site-specific nature, these considerations are Plan implementation functions that are more appropriately addressed outside of the Plan.

Ultimately, our success at meeting viability requirements must be viewed from the perspective of the entire planning process, which includes not just the strategic revised Plan, but also Plan-to-project considerations, site-specific project analysis, and monitoring feedback. We believe the treatment given to species viability in the revised Plan and EIS provides us with a solid, and much improved, strategic framework from which to meet species viability requirements as the revised Plan is implemented and monitored.

Chapter 4

Transportation

Forest Transportation System (General)

4-1. Public Concern: The Forest Service should emphasize the importance of the transportation system.

Response: Access and road management was identified as one of the significant issues considered in defining the alternative management strategies. Science-based roads analyses at the appropriate scales (forest, watershed and project-scales) are conducted as required in FSM 7712. The objectives of roads analyses are to provide Forest Service planners and decision makers with critical information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions.

4-2. Public Concern: The Forest Service should improve the transportation system to protect soil and water resources.

Response: The reference pertains to maintenance of ORV trails where the statement, under the Effects of Roads and Recreational Trails section, "Required maintenance has been limited in the past by constrained budget financing", raises concern for sedimentation reaching streams. The direct effect of less maintenance of ORV trails is increases in soil erosion. Budget constraints do affect the effectiveness of maintaining ORV trails as it relates to controlling soil erosion. Priority is given to maintaining trail sections and associated soil erosion standards in proximity to waterways on the forest. Monitoring information has assisted with setting this priority. Continued monitoring will provide information as to the status of trail condition. Recommendations will follow providing for soil and water mitigation.

4-3. Public Concern: The Forest Service should develop and enforce road density standards.

AND FORBID AN EXTENSION OF THE TALLADEGA SCENIC DRIVE

Response: Open roads density standards should only be established when supported by site-specific science-based analysis. An interdisciplinary science-based roads analysis at the appropriate scale will be used to inform planners and decision makers of needed and unneeded roads and to recommend priorities for implementation. When *open road density standards are warranted, measures will be taken to enforce the standards. Any proposals to extend the scenic drive would follow this process.*

4-4. Public Concern: The Forest Service should allow footpaths only.

Response: Restricting transportation to footpaths only is inconsistent with achieving the objectives of the Multiple Use Sustained Yield Act.

Roads Infrastructure Management (General)

4-5. Public Concern: The Forest Service should develop goals and objectives for reducing road mileage to fiscally responsible levels.

Response: Each forest has objectives for road management. In addition, before the Record of Decision was signed finalizing the decision on the Plan, a Roads Analysis was completed that laid out objectives for road management, including reduction of road miles.

4-6. Public Concern: The Forest Service should develop more road access to National Forest System lands.

Response: This concern is best addressed at a watershed or project decision level. An interdisciplinary science-based roads analysis at the appropriate scale will be used to inform planners and decision makers of needs for additional access and to recommend priorities.

4-7. Public Concern: The Forest Service should not pave several roads.

INCLUDING ANY PORTION OF THE HIGH TOWN PATH

Response: The decision whether or not to pave a particular road will be made on a site-specific basis. This is not a Plan level decision.

4-8. Public Concern: The Forest Service should pave forest roads with permeable methodologies to stop runoff and increase user access.

Response: National Forest System (NFS) roads serve a multitude of uses and are constructed and maintained to best serve the intended use within available funding. These roads may range from single lane roads with turnouts to double lane roads. Road surfaces vary from native surfaced to bituminous paved roads. Road management objectives are developed for each NFS road that guide road design criteria and planned maintenance. Many factors are considered in determining what type of road surfacing is most appropriate. They include, but are not limited to traffic (volume *and types of vehicles), resource protection (water quality, erosion, etc.), climate, strength of underlying soils, user safety and comfort, economics and availability of funds. Road management objectives are reviewed periodically for appropriateness.*

4-9. Public Concern: The Forest Service should prioritize infrastructure repair over new construction.

Response: This concern is beyond the scope of Plan revision. These decisions are made by line officers at a project level.

Roads Analysis

4-10. Public Concern: The Forest Service should conduct the roads analysis process.

Response: A forest-scale roads analysis has been completed to inform the decision as required in FSM 7712. While it is desirable to have the forest-scale roads analysis completed prior to issuance of the draft, it is not a requirement

4-11. Public Concern: The Forest Service should incorporate the analysis of the road system into the draft plan revision before it becomes final and involve the public in the roads analysis process.

Response: A forest-scale roads analysis has been completed to inform the decision as required in FSM 7712. The roads analysis process is not a NEPA decision process and therefore does not require a formal public scoping and comment period. Public involvement in identification of issues and assessment of transportation needs and opportunities was encouraged and welcomed.

4-12. Public Concern: The Forest Service should conduct a new roads analysis.

AND THEN DETERMINE OBJECTIVES

AND APPLY OPEN ROADS STANDARDS TO TEMPORARY AND GATED ROADS

AND IDENTIFY ROADS OR MILEAGE TO BE DECOMMISSIONED

Response: The forest-scale roads analysis was not intended to analyze the all roads (classified and unclassified) on National Forest lands. There are multiple scales at which roads analysis may be conducted to inform road management decisions. Roads analysis at the forest-scale provides the context for informing road management decisions and activities at the watershed, area and project level. The forest-scale roads analysis and the resulting report 1) display the classified roads and display how the roads are intended to be managed; 2) provide guidelines for addressing road *management issues and priorities; 3) identify significant social and environmental issues, concerns and opportunities to be analyzed through lower level analyses; and 4) document coordination efforts with other government agencies (FSM 7712.13b.). The Responsible Official has the discretion and duty to determine whether or not a roads analysis below the forest-scale is needed and the degree of detail that is appropriate and practicable. (FSM 7712.13*

4-13. Public Concern: The Forest Service should develop criteria for when a watershed or project scale roads analysis will be needed.

Response: The Forest Service has issued direction on roads analysis at the watershed and project scales. "The responsible Official has the discretion and duty to determine whether or not a roads analysis below the forest-scale is needed and the degree of detail that is appropriate and practicable. Guidance on selecting the appropriate scale and those proposed actions which may trigger a need for a roads analysis is set forth in FSM 7712.13, paragraphs a-c." (FSM 7712.13) Additional guidance is provided in the report Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (USDA Forest Service, 1999, Misc. Report FS-643).

4-14. Public Concern: The Forest Service should demonstrate which roads are necessary to implement the forest plan.

Response: The district ranger, on a case-by-case basis at the site-specific level, makes the actual determination of which roads are necessary. This is not a Plan level decision.

4-15. Public Concern: The Forest Service should include only realistic projections of environmental effects in the roads analysis based on likely natural processes and management activities.

Response: We believe that the environmental effects analysis is based on reasonable projections that reflect natural processes that are likely and management activities that we anticipate. Since these processes and activities have not yet occurred, it is difficult to determine what they will be. However, it is the job of the interdisciplinary team to make these determinations.

4-16. Public Concern: The Forest Service should conduct a meaningful analysis of the effects of road construction and maintenance on aquatic habitats.

Response: The EIS analyzes road construction and maintenance activities as a potential effect on aquatic habitats through direct, indirect, and cumulative impacts (EIS sections 3.A.2, 3.B.4.0, 3.B.6.2, 3.B.7.2). Revised Plan direction would include several *standards relevant to the minimization of potential effects of road construction and maintenance on aquatic habitats (see response to PC 4-18).*

4-17. Public Concern: The Forest Service should identify a minimum road system option as required by Forest Service Manual 7712.11.

Response: 36 CFR 212.5 requires the Forest Service to identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands, using a science-based roads analysis at the appropriate scale. The forest-scale roads analysis was not intended to analyze all roads (classified and unclassified) on National Forest lands. There are multiple scales at which roads analysis may be conducted to inform road management decisions. Roads analysis at the forest-scale provides the context for informing road management decisions and activities at the watershed, area and project level. Outcomes of roads analysis at the watershed and area-scale would identify needed and unneeded roads (FSM 7712.13c)

Road Construction, Reconstruction, and Maintenance

4-18. Public Concern: The Forest Service should develop standards to ensure that aquatic resources are protected from damage due to increased road use and maintenance.

Response: Under the revised Plan, numerous standards would serve to protect aquatic resources from negative effects of either ongoing or increased levels of road use and maintenance (see response to PC 4-16).

4-19. Public Concern: The Forest Service should clarify whether or not temporary roads are included in construction estimates.

Response: This concern is best addressed at the project level. The construction cost estimates of temporary roads associated with timber harvest are included in the sale appraisal and reflected in the stumpage price.

4-20. Public Concern: The Forest Service should only construct new roads if no other feasible alternative exists to deal with emergency situations.

Response: Road standards should only be established when supported by site-specific science-based analysis. Decisions on road construction, reconstruction, and decommissioning are best handled at the watershed or project level based upon site-specific information and analysis. An interdisciplinary science-based roads analysis at the appropriate scale will be used to inform planners and decision makers of needed and unneeded roads and to recommend priorities for implementation.

4-21. Public Concern: The Forest Service should construct roads for timber harvesting.

Response: This concern is best addressed at the project level. An interdisciplinary science-based roads analysis at the appropriate scale will be used to inform planners and decision makers of needs for additional access and to recommend priorities.

4-22. Public Concern: The Forest Service should only consider new roads if they help in maintaining and protecting sensitive areas.

Response: The decision to build or not to build new roads will be made on a project level basis. An interdisciplinary science-based roads analysis at the appropriate scale will be used to inform planners and decision makers of needs for additional access and to recommend priorities.

4-23. Public Concern: The Forest Service should not construct additional roads.

Response: Certain management prescriptions such as wilderness, wild rivers, and remote backcountry recreation (12.A and 12.B) forbid the construction of new roads. Otherwise, the decision to build or not to build new roads will be made on a project level basis.

4-24. Public Concern: The Forest Service should consider the costs of road construction for creating the desired conditions outlined in the proposed plan.

Response: The revised Plan identifies the desired conditions to be achieved, and the EIS explains the projected outputs and activities needed to meet those desired conditions, along with the environmental effects of those projected outputs and activities. The commenter is correct that the Forest Service may not receive the full budget needed to carry out all the activities projected in the Plan and EIS.

4-25. Public Concern: The Forest Service should decrease the number of roads and maintain them better.

Response: The Forest Service is conducting roads analyses, at appropriate scales, to:

1. *Identify transportation management opportunities and priorities;*
2. *Assess transportation management needs, long-term funding, and expected ecosystem, social, and economic effects; and*
3. *Establish transportation management objectives and priorities.*

Generally, the watershed-scale roads analysis will be the most appropriate scale to identify and prioritize roads that are no longer needed or those roads needing major improvement. Road management decisions and timing of their implementation may be affected by several factors, such as public safety, resource effects, and availability of funding.

4-26. Public Concern: The Forest Service should provide additional information and analysis of the extent to which current and planned roads impact forest resources.

AND SHOULD IMPROVE MANAGEMENT GOALS AND OBJECTIVES TO ADDRESS THE ISSUE

Response: The Forest has completed the required forest-wide roads analysis that is a programmatic level of analysis. Specific roads are not considered in the forest-wide analysis. Specific roads and their impacts on forest resources are considered in a subsequent watershed or project level roads analysis.

4-27. Public Concern: The Forest Service should consider using Maryland Department of Transportation's floodplain culverts to create more stable stream crossings.

Response: Specific design criteria and alternative designs are developed at the project level. Protection of water quality will be emphasized in the all road design, construction and reconstruction projects.

4-28. Public Concern: The Forest Service should rewrite Objective 31.1 to inventory for all roads and trails affecting aquatic habitat and plan what to do with them.

AND REWRITE 31.2 TO PLACE A PRIORITY ON IMPROVING ROADS AND TRAILS IMPACTING OR THREATENING WATER BODIES CONTAINING LISTED SPECIES

Response: Objective 31.1 specifically deals with culverts and low water crossings and their effects on aquatic species. Objective 31.2 is limited to set road maintenance and reconstruction project priorities in order to support threatened, endangered, and sensitive species recovery and conservation efforts.

Road/Removal/Decommissioning

4-29. Public Concern: The Forest Service should close forest roads.

Response: This concern is best addressed at a watershed or project decision scale rather than in forest planning. An interdisciplinary science-based roads analysis at the *appropriate scale will be used to inform planners and decision makers of needed and unneeded roads and to recommend priorities.*

4-30. Public Concern: The Forest Service should close the Skyway Motorway from the radio tower to the boundary of the Hollins Wildlife Management Area.

Response: The Rebecca Mountain Wilderness Study Area defined in Alternative E would require closure of this road within the prescription boundary.

4-31. Public Concern: The Forest Service should allow for wildlife food plantings on decommissioned roads.

Response: The decision to locate create wildlife food plantings is a site specific decision. Wildlife plantings are not prohibited on decommissioned roads.

4-32. Public Concern: The Forest Service should develop objectives or standards for decommissioning roads.

Response: Opportunities and related objectives for decommissioning roads are considered in the Roads Analysis process that was done at the Forest scale and completed before the decision was made on the Forest Land and Resource Management Plan.

4-33. Public Concern: The Forest Service should add direction to management prescriptions for deconstructing roads.

Response: Opportunities and related objectives for decommissioning roads are considered in the Roads Analysis process which was done at the Forest scale and completed before the decision was made on the Forest Land and Resource Management Plan.

Motorized Trails

4-34. Public Concern: The Forest Service should work to repair OHV trails and control sedimentation from ground disturbing activities.

Response: The plan has provisions that call for trail maintenance and repair of designated OHV trails. Wherever there are ground disturbing activities, such as excessive OHV use, the revised Plan requires that the Forest monitor, evaluate, and restore the ground and prevent sedimentation. Actual work is done based on priorities and on amount of available funding. The revised Plan contains forest-wide and riparian standards to control sediment related to ground-disturbing activities.

4-35. Public Concern: The Forest Service should explain the rationale for the increase in acreages prescribed for OHV use.

AND SHOULD CORRECT THE DISCREPANCIES BETWEEN TABLE 3C-15 ON PAGE 3-361 AND TABLE 2.1 ON PAGE 2-13

Response: Table 3C-15 has been corrected to match Table 2.1. The areas designated 7C in the action alternatives (A, B, D, E, G, I) better delineate areas having current trails than the area assigned to 7.C in Alternative F. OHV trails can exist in many management prescriptions other than 7C. Management Prescriptions direct emphasis but do not set exclusive use. However, any proposed OHV trails, including those proposed in prescription 7.C will be a function of: 1. budgets, 2. Plan Appendix I – Locational Criteria Checklist for New OHV, and 3. the applicable standards.

Chapter 5

Recreation

Recreation Management Prescriptions

Specific Management Prescriptions

Alabama National Forests

5-1. Public Concern: The Forest Service should change Management Prescription 12-A (motorized) to 12-B (non-motorized) to protect several areas from ATVs.

Response: OHV trail development, which includes ATVs, is not allowed to occur in the 12.A prescription and no motorized trails exist in the areas proposed for 12.A.

5-2. Public Concern: The Forest Service should modify Management Prescription 12.A.

The area assigned Prescription 12.A on the Bankhead Ranger District in Alternative I was assigned 12.B in Alternative F.

The Oakey Mountain area assigned Prescription 12.A on the Shoal Creek Ranger District in Alternative I was not assigned 12.B in any alternative, but it was recommended for wilderness, Prescription 1.B, in Alternative G.

The area southwest of the Dugger Wilderness assigned Prescription 12.A on the Shoal Creek Ranger District in Alternative I was not assigned 12.B in any other of the alternatives studied in detail nor was it assigned any type of non motorized prescription. However, this area was assigned Prescription 0 (Custodial Management) in Alternative C which would likely result in this area eventually becoming non-motorized.

5-3. Public Concern: The Forest Service should assign the Management Prescription 12.B, Remote Backcountry Recreation Non-Motorized, to several areas on the forest.

INCLUDING ALL AREAS CURRENTLY DESIGNATED 12.A

Response: The area assigned Prescription 12.A on the Bankhead Ranger District in Alternative I was assigned 12.B in Alternative F.

The Oakey Mountain area assigned Prescription 12.A on the Shoal Creek Ranger District in Alternative I was not assigned 12.B in any alternative, but it was recommended for wilderness, Prescription 1.B, in Alternative G.

The area southwest of the Dugger Wilderness assigned Prescription 12.A on the Shoal Creek Ranger District in Alternative I was not assigned 12.B in any other of the alternatives studied in detail nor was it assigned any type of non motorized prescription. However, this area was assigned Prescription 0 (Custodial Management) in Alternative C which would likely result in this area eventually becoming non-motorized.

Recreation Management (General)

5-4. Public Concern: The Forest Service should address the effects of recreation on heritage sites.

Response: Section 106 of the National Historic Preservation Act (NHPA) directs the Forest Service to take into consideration the effects of all undertakings, including developed and dispersed recreation projects, on heritage sites (See page 3-402 for recreation analysis).

5-5. Public Concern: The Forest Service should not presume that a wilderness designation allows only recreation.

Response: The Environmental Impact Statements (EIS) in addressing Issue 8 - Roadless Areas and Wilderness Management discloses that Wilderness, roadless and other un-roaded areas are managed to provide their full range of social and ecological benefits. The EIS further discloses that in addition to outdoor recreation in wilderness, there is a non-user component that values American wilderness. Wilderness is valued for preserving representative natural ecosystems and local landscapes. The very existence of wilderness is valued by the American public as part of the natural heritage of the country.

5-6. Public Concern: The Forest Service should recognize the importance of public land recreation.

AND EMPHASIZE THESE USES ABOVE MONEY MAKING INTERESTS

PARTICULARLY AS DEMAND INCREASES FOR RECREATIONAL OPPORTUNITIES

Response: The management emphasis for Alternative I is forest recreation and forest restoration. The DEIS recognizes demand is increasing for public land recreation including wilderness visitation. Alternative I applies a mix of prescriptions that emphasis outdoor recreation opportunities and forest restoration. The revised Plan only recommends wilderness for areas deemed appropriate for addition into the national wilderness preservation system.

5-7. Public Concern: The Forest Service should not support recreational activities at the expense of the ecological integrity of resources.

Response: All recreational activities are subject to all the standards designed to protect the ecological integrity of forest resources. Management prescriptions describe the emphasis for management direction. The application of different management prescriptions will result in different recreational settings. Different recreational settings facilitate or favor different recreation activities.

5-8. Public Concern: The Forest Service should not encourage commercial recreation, but rather low-impact recreation.

Response: The recreation emphasis aspects of the revised Plan are designed to connect citizens to the National Forests in Alabama. Nature based recreation is the only type recreation promoted. The methods and decisions for funding recreational opportunities are not directed by the Plan. All alternatives do include certain permissible activities, such as driving for pleasure and OHV riding, that some will consider high impact recreation.

5-9. Public Concern: The Forest Service should better analyze the supply and demand for wilderness-based recreation.

Response: Many comments were received throughout the planning process concerning the 1997 guidance from the Region on methodologies for calculating recreational supply and demand for wilderness. This included a calculation of the "practical maximum capacity" of roadless and wilderness areas. The Region recognized the concerns with this methodology and issued a letter on March 8, 2002 which emphasized that these calculations are "theoretical" and that the "rationale for the wilderness recommendations should be based on the merits of each roadless area and the sustainability of wilderness values".

As a result, the calculations from this methodology are not included anywhere in the EIS, and they were not a determining factor in making wilderness recommendations. What were determining factors were the factors identified in the Forest Service Handbook at FSH 1909.12, Chapter 7.23b. These factors are:

- *The location, size, and type of other wildernesses in the general vicinity and their distance from the proposed area,*
- *Present visitor pressure on other wildernesses,*
- *The extent to which non-wilderness lands provide opportunities for unconfined outdoor recreation experiences,*
- *The habitat needs of certain biotic species (those that need "protected areas" or those that cannot survive in "primitive surroundings"), and*

- *An area's ability to provide for preservation of identifiable landform types and ecosystems.*

The answers to some of these factors are in the individual roadless area descriptions found in Appendix C. However, for some of the other factors within a particular National Forest, the answers were essentially the same for each roadless area. In these cases, an overall assessment of the "need" for wilderness on a National Forest was summarized in the EIS.

5-10. Public Concern: The Forest Service should better analyze the real price of recreational opportunities on National Forest System lands.

Response: The most recent information available at the time of our analysis are prices expressed in 1989 dollars and estimated from 1989 to 2040 are found in the FS publication "Resource Pricing and Valuation Procedures for the Recommended 1990 RPA Program", which is a part of the Process Record. We estimated the real price growth to year 2000 and adjusted the values to reflect 2000 prices. If revised prices are made available from Forest Service Research and Forest Service Strategic Planning and Resource Assessment Units before the Final Draft EIS is release, these new prices will be substituted for the DEIS prices.

5-11. Public Concern: The Forest Service should better document the need for recreation on National Forest System lands.

Response: See response to PC 5-9.

5-12. Public Concern: The Forest Service should consider the impact of recreational development on cultural sites.

Response: Section 106 of the National Historic Preservation Act (NHPA) directs the Forest Service to take into consideration the effects of all undertakings, including developed and dispersed recreation projects, on heritage sites (See Chapter 3 of the FEIS for recreation analysis).

Recreation Types/Opportunities

Motorized Recreation–Management Prescriptions

5-13. Public Concern: The Forest Service should only allow ATV use in Management Prescription 7.C, OHV Use Area.

Response: Through the 7.C prescription, the revised Plan identifies where the management will emphasize off highway vehicle ("OHV") recreation. In other prescriptions, OHV recreation may not be emphasized but may be compatible. For *example, a single trail or smaller trail system may already exist, or be appropriate for development, in other prescriptions. Finally, it is important to provide logical trail systems including connections between trail systems, trail heads, or points of interest. The revised Plan states where motorized recreation is prohibited or permitted.*

Additionally, a few comments continued that the EIS failed to consider a range of alternatives for motorized recreation. However, the EIS did examine a range of OHV opportunities among the seven alternatives. Chapters 2 and 3 discuss, by alternative, the acres allocated to the 7C prescription and the percent of estimated change in motorized trails.

Motorized Recreation–Management

5-14. Public Concern: The Forest Service should not open up more National Forest System lands to ATV use.

Response: Off-highway vehicle ("OHV") recreation is clearly a valid use of, as well as a frequently enjoyed activity, on National Forest Lands. See Executive Order 11644, as amended by Executive Order 11989, Use of Of-Road Vehicles on Public Lands, 37 FR 2877 (Feb. 9, 1972), 42 FR 26959 (May 25, 1977.) As overall strategic direction for forest lands, the revised Plan balances recreational use and protection of resources. It emphasizes OHV recreation in certain areas. It also recognizes that OHV recreation is inappropriate for certain settings due to impacts on ecological resources or conflicts with other recreationists or designated land uses.

This revised Plan provides an umbrella of direction for future site-specific developments by designating where OHV recreation may be compatible with other uses; it however does not make site-specific project decisions. Any future proposals for development of OHV routes – whether new systems or additions to existing systems - will require further site-specific project analysis which will take into account potential site-specific impacts such as noise, disturbance to wildlife, erosion, invasive species and conflicts with other uses. These future project proposals will solicit public comment on site-specific considerations such as location, length, use of roads, safety, vehicle types, trailheads, operational periods, and site-specific monitoring.

Screening Criteria for New OHV Systems in Appendix Iwere used as part of the process identifying lands for 7.C., OHV Use Area, prescription. These criteria help evaluate the potential environmental and social conflicts. During Plan implementation, these screening criteria will be used to guide the development of OHV opportunities in compatible prescriptions. For example, the potential impact of noise associated will be examined and, if necessary, mitigation measures will be designed to reduce negative effects to an acceptable level.

Finally, a large number of comments were concerned with proper trail design, trail maintenance, presence of law enforcement, illegal riding off designated OHV routes and damage to the land by illegal riding. We agree that proper program management is important to the success of OHV recreation. Partnerships with motorized recreationists, communities, forest interest groups, other law enforcement agencies and public land manager are also essential in providing information on where and how to ride. The Agency is committed to offering high quality OHV riding opportunities in a natural setting and is committed to the stewardship of Forest Service lands. Plan-level decisions on OHV recreation are reviewed in the annual Plan monitoring report. Additionally, current regulations give the authority to land managers to close areas that are being adversely impacted. See 36 CFR 295, Use of Motor Vehicles Off Roads, and 36 CFR 261, Prohibitions.

5-15. Public Concern: The Forest Service should prohibit ATV use on National Forest System lands.

BECAUSE OF THE ENVIRONMENTAL DAMAGE THESE VEHICLES DO

Response: See response to PC 5-14.

Mechanized Recreation

5-16. Public Concern: The Forest Service should not limit bicycle use to designated bicycle trails.

BECAUSE THE RECREATIONAL AND HEALTH BENEFITS OF MOUNTAIN BIKING FAR OUTWEIGH THE MINIMAL IMPACTS ON THE LAND

Response: Trails and other dispersed recreation activities are a large part of the overall recreation program for the Southern Appalachian National Forests. The revised Plan does not specifically restrict bicycle use to designated trails. Some trails are closed to bicycle use by law or by closure order.

5-17. Public Concern: The Forest Service should continue to support mountain biking activities on National Forest System lands.

BECAUSE LOCAL MOUNTAIN BIKERS SPEND MANY HOURS PER YEAR ON TRAIL MAINTENANCE, USER EDUCATION, AND MOUNTAIN BIKE PATROLS

Response: Thank you for your comment.

5-18. Public Concern: The Forest Service should provide more mountain biking opportunities on the Alabama National Forest.

Response: Mountain bike trail development is appropriate in every prescription except wilderness. The revised Plan is strategic not site specific; therefore, decisions about if and where to build mountain bike trails will be made at the project level and governed *by budget and environmental conditions tempered by the demand for mountain bike trails in regards to other recreation needs.*

5-19. Public Concern: The Forest Service should develop mountain bike trails on the Okmulgee National Forest.

Response: Mountain bike trail development is possible in every Oakmulgee prescription. The revised Plan is strategic not site specific; therefore, decisions on if and where to build mountain bike trails will be made at the project level and governed by budget and environmental conditions tempered by the demand for mountain bike trails in regards to other recreation needs

5-20. Public Concern: The Forest Service should allow biking on some sections of the Pinhoti Trail.

Response: The revised Plan is silent on mountain bikes using or not using the Pinhoti Trail. The Wilderness Act prohibits mountain bike use in designated wilderness and a Forest Closure Order prohibits mountain bike use on the non-wilderness sections of the trail.

Non-Motorized Recreation

5-21. Public Concern: The Forest Service should support hiking activities on National Forest System lands.

Response: Hiking trails are permitted in every management prescription. Forest Recreation and Forest Restoration are the emphasis of Alternative I. Hiking is a key component of Forest Recreation. Availability of funds and availability of workers (paid and volunteer) affect trail conditions. Restoration projects with non-recreation goals may negatively affect trail settings in the short run on certain portions of the Forest throughout the life of this Plan.

5-22. Public Concern: The Forest Service should suspend enforcement of the "Rainbow Rule".

Response: A Forest Service Regulation (CFR) requires Non Commercial Group Use Permits and they are beyond the authority of Forest Plans.

Hunting and Fishing

5-23. Public Concern: The Forest Service should emphasize wildlife management, hunting, and fishing in the Black Warrior and Choccolocco Wildlife Management Areas.

Response: Hunting and fishing are listed with other appropriate dispersed recreation activities in the 7.E.2 Management Prescription. Significant portions of the Black Warrior and Choccolocco Wildlife Management Areas were assigned the 7.E.2 Prescription. Therefore, language was included in the prescription that states hunting and wildlife viewing are expected to be important components of the 7.E.2 prescription where it coincides with these wildlife management areas.

Trails (general)

5-24. Public Concern: The Forest Service should support the GEM Trail.

Response: *The demand for trails of all kinds is increasing while budgets for construction and maintenance of trails remain static or often decreases. The overall focus of each of the Southern Appalachian Forests in the Plan revision is to work to maintain and improve current trail systems and to analyze any additional needs for trails as funding permits. Analysis of a long distance trail through the Southern Appalachians was not analyzed as part of our Plan revision. A long distance trail such as the Great Eastern Mountains Trail will require a separate planning effort that would tier to the revised Plan.*

Trail development is compatible with the revised Plans as are the goals to reduce congestion on the Appalachian Trail and provide multiple-use trail opportunities. We would encourage interested publics to begin to dialog with all forests that would be affected by the proposed GEM trails to discuss the feasibility and opportunity for success in such an ambitious endeavor.

5-25. Public Concern: The Forest Service should develop a continuous, multi-use trail corridor along the length of the Appalachian Mountains.

Response: See response to PC 5-24.

5-26. Public Concern: The Forest Service should establish new hiking trails on the Bankhead, Talladega, and Oakmulgee National Forests.

Response: The proposed revised plan is strategic in nature and does not address specific projects. The plan does have a goal to provide a spectrum of high quality, nature-based recreation settings and opportunities. New hiking trails on the Bankhead and Talladega National Forests would fit under that goal. The Oakmulgee Ranger District is part of the Talladega National Forest.

Equestrian Recreation

5-27. Public Concern: The Forest Service should not limit equestrian use to only designated trails.

BUT SHOULD ONLY LIMIT USE IN AREAS THAT HAVE BEEN DAMAGED OR ARE IN NEED OF PROTECTION

INCLUDING TRAILS IN WILDERNESS AREAS

BECAUSE CURRENT REGULATIONS ADEQUATELY PROTECT RESOURCES FROM DAMAGE DUE TO OFF-TRAIL RIDING

Response: Restricting equestrian use to: designated horse trails, open public roads, or closed Forest Service roads if designated open to horse use by the district ranger is not a new policy for the National Forests in Alabama. These restrictions were made necessary because of unacceptable soil, water, and aquatic resource damage. The Plan direction tries to provide a balance between protecting the environment and providing horseback riding opportunities.

Trails may be designated for equestrian use in wilderness based on resources, budgets, and demand. Currently, only the Sipsey Wilderness offers designated equestrian opportunities.

Other Developed Facilities

5-28. Public Concern: The Forest Service should support shooting ranges.

Response: Shooting ranges are an appropriate and listed developed recreation opportunity. Currently every district has one shooting range. The Oakmulgee Ranger District has an area designated for a second range. Availability of maintenance funds will govern the timing of constructing the proposed Oakmulgee Westside Range.

Fee Demonstration Project and User Fees

5-29. Public Concern: The Forest Service should end the Recreation Fee Demonstration Program.

Response: Fee determination is beyond the scope of the Plan revision process.

Scenery and Visual Resources Management (Aesthetics)

5-30. Public Concern: The Forest Service should establish a visual corridor for the Benton Mackaye, Bartram, and Pinhoti Trails.

Response: In mapping the inventory of the scenic resource, the Bartram and Pinhoti Trails are assigned high concern levels, and the trails are used to map the seen areas from these trails. Standards in Chapter 2 of the plan provide corridor protection zones, user safety, and managing for high SIO. These standards and management direction provide for the scenic protection of these trails.

Chapter 6

Special Designations/Lands

Special Designations

Special Designations (General)

6-1. Public Concern: The Forest Service should make the Bankhead National Forest into a National Park.

Response: Designation of National Parks is under the purview of Congress and beyond the scope of Plan revision.

Roadless Areas

6-2. Public Concern: The Forest Service should comply with its own documentation of which prescriptions are compatible with maintaining roadless character.

Response: The prescriptions that protect the roadless character vary by Forest Plan. Each forest could add additional restrictions that would restrict certain actions to a generic prescription that would protect roadless character where the generic prescription would not. As a result, one prescription that will protect roadless character in one Plan may not protect it in another. While not all Forest Plans or EISs list which prescriptions are compatible, the revised Plan or EIS does show acres or percent of acres that have their roadless character protected.

6-3. Public Concern: The Forest Service should list prescriptions considered roadless compatible.

Response: The prescriptions that protect the roadless character vary by Forest Plan. Each forest could add additional restrictions that would restrict certain actions to a generic prescription that would protect roadless character where the generic prescription would not. As a result, a prescription that will protect roadless character in one Forest Plan may not protect it in another. While not all Forest Plans or EISs list which prescriptions are compatible, the revised Plan or EIS does show acres or percent of acres that have their roadless character protected.

6-4. Public Concern: The Forest Service should ensure that management direction is consistent with the Roadless Area Conservation Rule.

Response: On July 14, 2003, a Federal District Court Judge permanently enjoined the 2000 Roadless Area Conservation Rule. Should this decision be overturned through further court proceedings, and the RACR go into effect, then the direction from this Rule would supercede Plan direction. Additionally, should the RACR go into effect, it would not require an amendment or revision of the Forest Plan (36 CFR 294.14(b)).

In terms of the revised Plan being consistent with the RACR, in the selected alternative, 100 % of the roadless areas would have their roadless characteristics maintained and 100 % of the roadless areas would be consistent with the RACR.

6-5. Public Concern: The Forest Service should follow regional guidance regarding roadless inventories.

Response: There are three steps to determining what lands to recommend for wilderness designation. The first step is described in FSH 1909.12, Chapter 7.1, which states that, "The first step in the evaluation of potential wilderness is to identify and inventory all roadless, undeveloped areas that satisfy the definition of wilderness found in section 2(c) of the 1964 Wilderness Act." This involves using the criteria in FSH 1909.12, Chapter 7.1 to identify those "roadless" areas. The region also issued guidance in 1995 to provide some consistency on how to interpret that direction. Once the areas meeting the criteria are identified, the next step is to "evaluate" these areas to determine their "suitability" for wilderness recommendations. As is stated in FSH 1909.12, Chapter 7.2, "An area recommended as suitable for wilderness must meet the tests of capability, availability and need." The region also issued guidance in 1997 to provide some consistency on how to interpret the direction in FSH 1909.12, Chapter 7.2 on "evaluating" the roadless areas. The last step is during the development of the Plan alternatives where the effects of recommending or not recommending the roadless areas for wilderness designation are analyzed and documented in the environmental impact statement. The Forests have followed these three steps.

6-6. Public Concern: The Forest Service should ensure that roadless evaluations and wilderness recommendations are consistent with the intent of Congress, the Forest Service Handbook, and NEPA.

Response: See response to PC 6-5.

6-7. Public Concern: The Forest Service should more adequately protect roadless areas.

WITH 1.B, 12.B, OR 12.C MANAGEMENT PRESCRIPTIONS

BECAUSE THE NINTH CIRCUIT COURT HAS REAFFIRMED THE LEGALITY OF THE ROADLESS AREA CONSERVATION RULE

Response: On July 14, 2003, a Federal District Court Judge permanently enjoined the 2000 Roadless Area Conservation Rule. Should this decision be overturned through *further court proceedings, and the RACR go into effect, then the direction from this Rule would supercede Forest Plan direction. Additionally, should the RACR go into effect, it would not require an amendment or revision of the Forest Plan (36 CFR 294.14(b)).*

In terms of the revised Plan being consistent with the RACR, in the selected alternative, 100 % of the roadless areas would have their roadless characteristics maintained and 100 % of the roadless areas would be consistent with the RACR.

6-8. Public Concern: The Forest Service should provide more information on roadless areas under consideration for wilderness as required by NEPA.

Response: Appendix C of the EIS provides information about each roadless area. Chapter 3 of the EIS, under the section on Roadless Areas provides information about how each roadless area will be managed in each alternative. Chapter 2, in the Comparisons of Alternatives, section provides a table that compares the acres recommended for wilderness designation by each alternative and the acres that would maintain their roadless characteristics by alternative, along with a table that identifies which roadless areas are recommended for wilderness designation by each alternative. Lastly, the Record of Decision provides the rationale for why the roadless areas were or were not recommended for wilderness designation in the selected alternative.

6-9. Public Concern: The Forest Service should act in accordance with the roadless policy.

Response: Neither the roadless analysis conducted in 1995 nor the revision in 1997 found the Brushy Lake Area or the Mayfield Addition to Reed Brake to meet the roadless inventory criteria. This analysis may be reviewed as part of the project record.

6-10. Public Concern: The Forest Service should place all unroaded areas into protective management.

Response: There is no requirement to place all unroaded areas into protective management. See PC 1.022, 1.124, and 6.007. For some roadless acres, it may be determined that there are some resource management needs that are not compatible with "protective management".

FSH 1909.12 - LAND AND RESOURCE MANAGEMENT PLANNING HANDBOOK, WO AMENDMENT 1909.12-92-1, CHAPTER 7 - WILDERNESS EVALUATION, 7.2 EVALUATION OF POTENTIAL WILDERNESS gives direction to carefully evaluate the potential addition of roadless areas to the National Wilderness Preservation System to determine the mix of land and resource uses that best meet public needs. Some areas are allotted status as a roadless area some are not.

6-11. Public Concern: The Forest Service should explain the difference between "inventoried roadless" and "unroaded" areas.

Response: Inventoried roadless areas were determined by the Forest Service to have roadless characteristics. These identified areas are allowed up to one half mile of improved road per 1,000 acres. Unroaded is a general term referring to an area of indeterminate size lacking roads.

6-12. Public Concern: The Forest Service should not use a standard of 2,500 core acres for protecting roadless values.

Response: One of the critical issues identified during individual forest reviews of their roadless inventories concerned the criterion from Forest Service Handbook 1909.12 (7.11b) requiring that a roadless area be "conducive to the perpetuation of wilderness values." The 1964 Wilderness Act defines a number of wilderness values. Among these values, Section 2 of the Act states that wildernesses must have "outstanding opportunities for solitude and a primitive and unconfined type of recreation." In an attempt to quantify this criterion, use of the Recreation Opportunity Spectrum (ROS) and the semi-primitive class of lands is recommended. As defined in the 1986 ROS Book, recreationists in areas inventoried as semi-primitive have a high to moderate "probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance...in an environment that offers challenge and risk." Based on this definition, semi-primitive lands were identified as the lands that best satisfied the solitude qualities of roadless areas. Therefore, it is desirable for the "core" of a roadless area to meet the conditions of a semi-primitive non-motorized or semi-primitive motorized ROS classification. (Generally, very few areas in the southern U.S. qualify under the "primitive" ROS classification.)

Since the ROS Book states that semi-primitive areas contain at least 2,500 acres (unless they are contiguous to primitive class lands), this 2,500-acre minimum size can be used as a screen to evaluate areas identified and mapped by either the forest or the public. This 2,500-acre screen does not apply to additions to existing wildernesses.

However, it is important to recognize that this 2,500-acre semi-primitive "core" size is not an absolute minimum. It is only a screen and as such is only used as a guide. Some areas above or below this size may or may not provide solitude. For these areas, look closely at topography, proximity to type and use of roads, population centers and other sights and sounds of human activity to determine if solitude and primitive and unconfined recreation could be experienced. This is a professional judgment based on knowledge of the area.

6-13. Public Concern: The Forest Service should not exceed the intended purposes and limits of "semi-primitive core" in eliminating areas from roadless protection.

Response: The Recreation Opportunity Spectrum (ROS) in defining its remoteness criteria establishes criteria for semi-primitive recreation settings. Areas that are at least ½ mile but not further than 3 miles from all roads quality as Semi-primitive Non-Motorized Areas and areas that are within ½ mile of primitive roads but not closer than ½ mile from better than primitive roads qualify as Semi-Primitive Motorized Areas. This was used as a guide in delineating the areas that have outstanding opportunities for solitude, and a primitive and unconfined type of recreation, and thus would be considered as a roadless area.

Inventories

6-14. Public Concern: The Forest Service should use proper criteria and methods in conducting roadless area inventories.

Response: The evaluation process for the Roadless Inventory followed FSH 1909.12 Land and Resource Management Planning Handbook, Chapter 7.2, Evaluation Of Potential Wilderness; Chapter 4.19c, Appendix C – Roadless Area Evaluation; and the July 22, 1997, letter on the Southern Region's Guidance to FSH 1909.12 Land and Resource Management Planning Handbook, Chapter 7.2, Evaluation Of Potential Wilderness, and Chapter 4.19c, Appendix C – Roadless Area Evaluation. This guidance was developed at the request of the Forests to define terms in the FSH 1909.12, Chapter 7, and Chapter 4.19c that were vague so that evaluations would be consistent in evaluating roadless areas.

6-15. Public Concern: The Forest Service should eliminate the "sights and sounds" criteria in determining areas suitable for the roadless inventory.

Response: Forest Land and Resource Management Plans followed direction in FSH 1909.12 - LAND AND RESOURCE MANAGEMENT PLANNING HANDBOOK, WO AMENDMENT 1909.12-92-1, EFFECTIVE 8/3/92, CHAPTER 7 - WILDERNESS EVALUATION, 7.2 - EVALUATION OF POTENTIAL WILDERNESS, which gives direction on evaluation of potential wilderness. One of the items given to consider is the ability to manage the area as wilderness. This is described as the degree to which the area contains the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness. One of the principal wilderness characteristics given to consider is Manageability and to specifically evaluate how boundaries affect manageability of an area. Boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization outside the wilderness. If the sights and sounds of *civilization are determined to be important, they must be described. It is proper to not consider lands that do not meet the test for capability.*

6-16. Public Concern: The Forest Service should remove regionally added restrictions on roadless inventory.

Response: The evaluation process for the Roadless Inventory followed FSH 1909.12 Land and Resource Management Planning Handbook, Chapter 7.2, Evaluation Of Potential Wilderness; Chapter 4.19c, Appendix C – Roadless Area Evaluation; and the July 22, 1997, letter on the Southern Region's Guidance to FSH 1909.12 Land and Resource Management Planning Handbook, Chapter 7.2, Evaluation Of Potential Wilderness, and Chapter 4.19c, Appendix C – Roadless Area Evaluation. This guidance was developed at the request of the Forests to define terms in the FSH 1909.12, Chapter 7 and Chapter 4.19c that were vague so that evaluations would be consistent in evaluating roadless areas.

6-17. Public Concern: The Forest Service should cite the regulatory or statutory basis for the idiosyncratic delineation of roadless areas on the Andrew Pickens Ranger District.

Response: The Andrew Pickens Ranger District is not part of the National Forests in Alabama.

Wilderness

6-18. Public Concern: The Forest Service should designate Wilderness or Wilderness Study Areas in all ecological units on the forest.

Response: Forest Land and Resource Management Plans followed direction in FSH 1909.12 - LAND AND RESOURCE MANAGEMENT PLANNING HANDBOOK, CHAPTER 7 - WILDERNESS EVALUATION, 7.2 - EVALUATION OF POTENTIAL WILDERNESS, 7.23 – Need, 7.23b – Factors, in determining which ecosystem unit to recommend for wilderness. The July 22, 1997, letter on the Southern Region's Guidance to FSH 1909.12 Land and Resource Management Planning Handbook, Chapter 7.2, Evaluation of Potential Wilderness, and Chapter 4.19c, Appendix C – Roadless Area Evaluation stated that the discussions of ecosystem section and subsections should be included. Appendix C of the EIS discloses the ecosystem section and subsection where each roadless area is located and if it would fill any void in representation. This is used to help determine the need for an area to be allocated to wilderness. Some sections or subsections had no lands that qualified for wilderness study.

6-19. Public Concern: The Forest Service should document the relative wilderness representation by ecological province, section, and subsection.

Response: Appendix C, Evaluation of Roadless Areas, of the EIS discloses if the roadless area is represented by an existing wilderness with its ecological province, section, and subsection, which establishes the need for representation by a wilderness.

6-20. Public Concern: The Forest Service should make critical wilderness information more accessible.

Response: Issue 8, Roadless Areas and Wilderness Management in the Environmental Impact Statement (EIS), Tables 2.10 and 2.12 display acres of recommended areas for Designation as Wilderness Study Areas and which areas are recommended for wilderness.

6-21. Public Concern: The Forest Service should provide Congress with a sufficient array of wilderness options to achieve Wilderness Act goals.

Response: The Southern Appalachian Forests all conducted a roadless area analysis and subsequent wilderness evaluations on these areas according to FSH 1909.12,7. The first step in the evaluation of potential wilderness is to identify and inventory all roadless, undeveloped areas that satisfy the definition of wilderness found in section 2(c) of the 1964 Wilderness Act (ch. 9). Section 2(c) defines wilderness as, "(…in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." The wilderness areas recommended within each of the revised Plans are based on analysis and discussion of the demand and need for additional wilderness areas.

Approximately 12% of the total number of wilderness areas designated in the United States are located in the Forest Service's Southern Region. These 12% cover a wide variety of ecosystem types. The only units in the Southern Region without a designated wilderness are the Land Between the Lakes National Recreation Area in Golden Pond, KY and the Caribbean National Forest in Puerto Rico. Forty-nine percent of the wilderness areas recommended in the Southern Appalachian Assessment are being *recommended for wilderness study. These 49%, designated as wilderness, will help to further implement the goals of the Wilderness Act.*

6-22. Public Concern: The Forest Service should address wilderness recommendations on a regional basis.

Response: Lands are evaluated from a regional perspective as part of the evaluation for recommendation for wilderness study as part of the Southern Appalachian Assessment. The study was done at the same time by all forests. Also, the criteria that is used for assessment directs the Forest Service to use a regional perspective. For example, rare community types, total lands allocated to ecosystem section and subsection, wilderness proximity to population centers are evaluated.

6-23. Public Concern: The Forest Service should make clear that human activities may not render an area ineligible for potential wilderness study.

Response: Past human activities may not render an area ineligible for potential wilderness study, but the Wilderness Act of 1964 directs that wilderness be managed to "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." Size is considered because wilderness is expected to provide "outstanding opportunities for solitude or a primitive and unconfined type of recreation."

6-24. Public Concern: The Forest Service should better document wilderness supply versus demand.

Response: See response for PC 6-30.

6-25. Public Concern: The Forest Service should include a wilderness supply and demand analysis in the DEIS.

Response: See response for PC 6-30.

6-26. Public Concern: The Forest Service should determine the need for wilderness through an analysis of the local and national distribution of wilderness.

Response: See response for PC 6-30.

6-27. Public Concern: The Forest Service should analyze wilderness capability, availability, and need as specified in the National Forest Management Act regulations.

Response: See response for PC 6-30.

6-28. Public Concern: The Forest Service should adequately explain the rationale for not recommending areas for wilderness.

Response: The rationale used in determining wilderness recommendations is explained in the record of decision document (R.O.D.).

6-29. Public Concern: The Forest Service should clarify the criteria used in determining wilderness recommendations.

Response: The rationale used in determining wilderness recommendations is explained in the record of decision document (R.O.D.).

6-30. Public Concern: The Forest Service should gather accurate wilderness demand baseline data.

Response: Many comments were received throughout the planning process concerning the 1997 guidance from the Region on methodologies for calculating recreational supply and demand for wilderness. This included a calculation of the "practical maximum capacity" of roadless and wilderness areas. The Region recognized the concerns with this methodology and issued a letter on March 8, 2002 which emphasized that these calculations are "theoretical" and that the "rationale for the wilderness recommendations should be based on the merits of each roadless area and the sustainability of wilderness values".

As a result, the calculations from this methodology are not included anywhere in the EIS, and they were not a determining factor in making wilderness recommendations. Determining factors were the factors identified in the Forest Service Handbook at FSH 1909.12, Chapter 7.23b. These factors are:

- *The location, size, and type of other wildernesses in the general vicinity and their distance from the proposed area,*
- *Present visitor pressure on other wildernesses,*
- *The extent to which nonwilderness lands provide opportunities for unconfined outdoor recreation experiences,*
- *The habitat needs of certain biotic species (those that need "protected areas" or those that cannot survive in "primitive surroundings"), and*
- *An area's ability to provide for preservation of identifiable landform types and ecosystems.*

The answers to some of these factors are in the individual roadless area descriptions found in Appendix C. However, for some of the other factors within a particular National Forest, the answers were essentially the same for each roadless area. In these cases, an overall assessment of the "need" for wilderness on a National Forest was summarized in the EIS.

6-31. Public Concern: The Forest Service should not use a formulaic process in evaluating potential wilderness areas.

Response: The Forest Service Handbook at FSH 1909.12, Chapter 4.19c and Chapter 7.2 identify the factors to use in evaluating potential wilderness areas. The region also issued guidance in 1997 to provide some consistency on how to interpret the direction in FSH 1909.12, Chapter 7.2 and 4.19c. The Forests then used this direction and guidance for their evaluations.

6-32. Public Concern: The Forest Service should not use regional guidance as rigid proclamations when recommending wilderness.

Response: The commenter references FSH 1909.12, Chapter 7.21,1 of the evaluation criteria, but does not recognize that Chapter 7.21a – Additional Capability Characteristics for Areas in the East, is also applicable. Under Chapter 7.21a, it states "National Forests east of the 100th meridian may contain limited nonconforming uses and/or nonconforming structures and improvements while retaining capability for wilderness designation".

6-33. Public Concern: The Forest Service should clarify the use of "solitude" as a definitive criterion in the delineation of potential wilderness areas.

Response: According to the 1964 Wilderness Act, an area of wilderness is defined to have "at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition." According to FSH 1909.12, Chapter 7, while the 5,000-acre limit is a specific criterion (with some exceptions) for lands in the Western U.S., for the Eastern U.S. because of landownership patterns, the 5,000-acre limit is not applicable. Therefore, some guidance is needed on how to determine that an area "is of sufficient size as to make practicable its preservation and use in an unimpaired condition". In attempting to provide that guidance, the other provisions of the Wilderness Act definitions need to be considered, including the criterion that an area needs to have "outstanding opportunities for solitude or a primitive and unconfined type of recreation" (Section 2(c)). In attempting to identify these areas, the only non-subjective inventory of acres with these characteristics that is available, is from the Recreation Opportunity Spectrum (ROS). Within the ROS, areas classified as either "semi-primitive" or "primitive" would generally meet the Wilderness Act criterion of providing "opportunities for solitude or a primitive and unconfined type of recreation". Since there are few "primitive" areas in the Eastern U.S., we primarily looked for the "semi-primitive" areas that, according to the ROS Handbook, need to contain at least 2,500 acres. However, we also recognized that this cannot be a hard and fast rule, and the regional guidance for inventorying roadless areas specifically states that – "it is important to recognize that this 2,500-acre semi-primitive 'core' size *is not an absolute minimum. It is only a screen and as such should be used only as a guide."*

6-34. Public Concern: The Forest Service should better communicate the basis for recommending areas for wilderness study.

Response: The rationale used in determining wilderness recommendations is explained in the record of decision document (R.O.D.).

6-35. Public Concern: The Forest Service should not interpret Congress's use of "challenge" to create extreme sport wilderness areas.

Response: Forest Land and Resource Management Plans followed direction in FSH 1909.12 - LAND AND RESOURCE MANAGEMENT PLANNING HANDBOOK, WO AMENDMENT 1909.12-92-1, EFFECTIVE 8/3/92, CHAPTER 7 - WILDERNESS EVALUATION, 7.2 - EVALUATION OF POTENTIAL WILDERNESS, which gives direction on evaluation of potential wilderness. The characteristic of "Challenge" is one of the characteristics in determining the quality of the wilderness resource that is included in the analysis. See PC 6-16 and PC 6-36 for additional comments.

6-36. Public Concern: The Forest Service should not follow regional guidance for the definition of "challenge" in wilderness areas.

Response: The guiding principles for describing "challenge" are from the Forest Service Handbook 1909.12, Chapter 7. The information in the regional guidance document the commenter is referencing was simply an example of what a write-up on "challenge" in a "generic" roadless area could possibly look like. The commenter has however, misinterpreted the "example write-up" as the actual guiding principles

6-37. Public Concern: The Forest Service should remove bias against consideration of stand-alone wilderness areas.

Response: The Regional guidance on developing a roadless area inventory, dated May 19, 1995; and the guidance on evaluating the roadless areas, dated July 22, 1997; both outline processes to identify and evaluate all the areas that meet the criteria for potential wilderness and not just those areas adjacent or contiguous to existing wilderness areas. The "design criteria" for the "rolling alternative" (Alternative I) did include a statement to start the development of this alternative with the "wilderness additions" being recommended for wilderness. However, this was only to be a "starting point" for further discussions/deliberations on which areas to include for wilderness recommendations within this particular alternative. It was these discussions/deliberations with the public, along with the information applicable to each roadless area, which led to the ultimate decision on which areas to recommend for wilderness in Alternative I. The Record of Decision then provides the rationale for why *roadless areas were recommended or not recommended for wilderness designation within the Selected Alternative.*

6-38. Public Concern: The Forest Service should include additional areas as wilderness study areas.

BECAUSE THE PUBLIC WANTS ADDITIONAL WILDERNESS

Response: There are not enough National Forest acres to meet all National Forest demands. Land allocations are a result of compromise. Recommended Wilderness Study Areas are not the only resource that citizens consider under represented or improperly emphasized.

6-39. Public Concern: The Forest Service should be consistent when eliminating wilderness area recommendations.

Response: Determining the inventory of wilderness is a straightforward account of what wildernesses are available in the area. The evaluation process for recommending roadless areas to the National Wilderness system is defined in FSH 1909.12 - LAND AND RESOURCE MANAGEMENT, PLANNING HANDBOOK, WO AMENDMENT 1909.12-92-1, CHAPTER 7 - WILDERNESS EVALUATION. Each Forest used this process for recommending and eliminating potential areas for wilderness recommendations. The recommendations responded to the management emphasis of each alternative. The revised Plans followed direction in FSH 1909.12 - LAND AND RESOURCE MANAGEMENT, PLANNING HANDBOOK, WO AMENDMENT 1909.12-92-1, CHAPTER 7.23 for determining need for an area to be designated as wilderness.

6-40. Public Concern: The Forest Service should protect all of the land that qualifies for wilderness.

Response: There are not enough National Forest acres to meet all National Forest demands. Land allocations are a result of compromise. Recommended Wilderness Study Areas are not the only resource that citizens consider under represented or improperly emphasized. In addition, land identified as having roadless characteristics is not necessarily suitable for recommended wilderness.

6-41. Public Concern: The Forest Service should consider non-inventoried roadless areas for possible wilderness recommendations.

Response: The Thompson Creek area on the Bankhead National Forest and the Rebecca Mountain area of the Talladega National Forest were assigned the Recommended Wilderness Study management prescription in Alternative E. The area south of the Dugger Wilderness was assigned the Recommended Wilderness Study management prescription in Alternative G.

6-42. Public Concern: The Forest Service should include suggested areas for recommended wilderness and wilderness expansions.

National Forest	Areas	Letter Numbers
Alabama	Oakey Mountain, Cokey Mountain, Blue Mountain, Brushy Fork, Rebecca Mountain, Mayfield Creek, Bear Bay, Black Bear Swamp, Bartram, Borden Creek, Montgomery Creek, Flannagin Creek, Talladega Mountains, Thompson-Tedford Creek Watersheds, McDill Point, Flint Creek Botanical Area, Oakmulgee District, Sipsey Wilderness expansion, Cheaha Wilderness expansion, Dugger Mountain Wilderness expansion, recommendations in the Wilderness Society’s “Alabama's Mountain Treasures”	219, 292, 375, 679, 722, 1494, 3041, 3322

BECAUSE DEMAND FOR WILDERNESS IS INCREASING

TO GAUGE THE EFFECTS OF LAND UNDER VARIOUS ACTIVE MANAGEMENT REGIMES

Response:

Proposed Area	***Action Taken***
Oakey Mountain	*Recommended wilderness study in Alternatives A & G*
Cokey Mountain	*Area not known*
Blue Mountain	*Recommended wilderness study in Alternatives A & B*
Brushy Fork	*Area not recommended*
Rebecca Mountain	*Recommended wilderness study in Alternative E*
Mayfield Creek	*Evaluated but not recommended (Reed Brake)*
Bear Bay	*Area not recommended*
Black Bear Swamp	*Area not known*
Bartram (botanical area)	*Area not recommended*
Borden Creek	*Area not recommended*
Montgomery Creek	*Area not recommended*
Flannagin Creek	*Area not recommended*
Talladega Mountains	*Oakey Mountain, Blue Mountain, Cheaha Additions, and Rebecca Mountain Areas recommended for wilderness study in various alternatives*
Thompson-Tedford Creek	*Recommended wilderness study in Alternative E*
McDill Point	*Recommended wilderness study in Alternatives I, A, B, D, E, G*
Flint Creek Botanical Area	*Area not recommended*
Oakmulgee District	*Area not recommended*

Proposed Area	***Action Taken***
Sipsey Wilderness Expansion	*Recommended wilderness study in Alternative E*
Cheaha Wilderness Expansion	*Recommended wilderness study in Alternative I, A, B, D, E, G (416 acres not included as wilderness study in Alt. I)*
Dugger Wilderness Expansion	*Recommended wilderness study in Alternative G*

All inventoried roadless areas were formally evaluated for a recommended wilderness study prescription. In addition, the Thompson Creek Area of the Bankhead National Forest and the Rebecca Mountain Area of the Talladega National Forest were assigned a recommended wilderness study prescription in Alternative E. and the Dugger Mountain Expansion Area was assigned wilderness study in Alternative G. These areas were assigned wilderness study in response to citizen involvement. Several other areas were informally considered by the I.D. Team for inclusion in a wilderness study prescription.

6-43. Public Concern: The Forest Service should remove the changes regarding wilderness designation, wilderness extension, and the protective prescription for the Conasauga River watershed.

Response: The National Forests in Alabama have no authority or jurisdiction over the Conasauga River Watershed.

Designated Wilderness

6-44. Public Concern: The Forest Service should protect the Sipsey Wilderness.

Response: Machines, including, but not limited to, bulldozers, chainsaws, and logging trucks, are not permitted by law in designated wildernesses. Timber harvesting is not permitted in designated wilderness.

Heritage and Cultural Resource Management

6-45. Public Concern: The Forest Service should use the Bankhead Heritage Management Plan as a guideline for managing cultural resources on National Forest System lands.

Response: The Bankhead Heritage Management Plan is still in draft. As written, the Bankhead Heritage Management Plan requires hiring seven additional archeologists and a budget of $450,000 for the Bankhead alone. A commitment of people and resources is beyond the scope of the Land Management Plan.

6-46. Public Concern: The Forest Service should comply with Section 106 of the Historic Preservation Act prior to any construction of entrance gates at caves.

BECAUSE CAVES AND SHELTERS MAY HOUSE SIGNIFICANT ARCHAEOLOGICAL SITES

Response: The Forest Service would examine the cave, as part of the Section 106 process, prior to any activities to determine if the cave was ever occupied or exploited by humans.

6-47. Public Concern: The Forest Service should not preclude recreational opportunities such as hunting in Cultural/Heritage Areas.

Response: The 4.E.1 prescription identifies hunting as well as hiking, photography, bird watching, and fishing as appropriate recreational activities within Cultural/Heritage areas.

6-48. Public Concern: The Forest Service should allocate, to several areas, the Management Prescription 4.E, Cultural/Heritage Areas.

AND INCLUDE MANAGEMENT RECOMMENDATIONS

Response: The first three areas mentioned in the comment, are in fact, already in the 4.E prescription. Several other areas, as well as other comments, are mentioned in reference to the Bankhead Heritage Management Plan (see above comment). Additional areas could be added to the 4.E prescription.

6-49. Public Concern: The Forest Service should consult the National Register of Historic Places and the Alabama Historical Commission when researching any project.

Response: Consultation with the Alabama Historical Commission (Alabama State Preservation Officer – SHPO) and checking the National Register of Historic Places is part of the Section 106 process.

6-50. Public Concern: The Forest Service should act to protect and preserve cultural resources.

IN EMERGENCY SITUATIONS

BUT ALLOW NATURAL RESTORATION PROCESSES

Response: Numerous federal laws instruct the Forest Service to do this. These laws are followed. Further comments reference Special Study Areas (SSAs) in the Bankhead Heritage Management Plan. (See above comment pertaining to Bankhead HMP.)

6-51. Public Concern: The Forest Service should do more to prevent looting of cultural resources.

Response: Under the Archaeological Resources Protection Act (ARPA), the Forest Service is instructed to do this. Law enforcement officers and archeologists have been trained in the law enforcement portion of this task. Archeologists also conduct public education programs to make the public aware of the law and the value of cultural resources.

6-52. Public Concern: The Forest Service should inventory all structures on the Bankhead National Forest.

Response: All structures on all of the National Forests will be inventoried in the Facilities Master Plan.

6-53. Public Concern: The Forest Service should identify and consider cultural resources prior to Federal undertakings.

Response: Section 106 of the National Historic Preservation Act (NHPA) directs the Forest Service to do this.

6-54. Public Concern: The Forest Service should document and preserve cemeteries.

Response: Two volunteers inventoried the cemeteries on the Bankhead National Forest. The Forest Service attempts to avoid these cemeteries in their land management activities. The other forests avoid the known cemeteries on their districts.

6-55. Public Concern: The Forest Service should annually submit progress reports on inventoried areas per Section 110.

This comment from the Alabama Historical Commission includes references to budgets and personnel needs in addition to requesting annual reports. These items could be included in an MOA with the AHC, but are beyond the scope of the Land Management Plan.

6-56. Public Concern: The Forest Service should meet annually with the special study area parties.

Response: These comments pertain to the annual meetings of special study area parties discussed in the Bankhead Heritage Management Plan. (See above comment pertaining to Bankhead HMP.)

6-57. Public Concern: The Forest Service should manage for the preservation of cultural areas.

Response: These comments pertain to the annual meetings of special study area parties discussed in the Bankhead Heritage Management Plan. The Bankhead Heritage Management Plan is still in draft. As written, the Bankhead Heritage Management Plan requires hiring seven additional archeologists and a budget of $450,000 for the Bankhead alone. A commitment of people and resources is beyond the scope of the Land Management Plan.

6-58. Public Concern: The Forest Service should make several changes related to cultural and historical resources to the Alabama National Forests PRLMP and DEIS.

Response: This concern consists of several comments. Regarding effects, direct effects from recreational development would be heritage sites affected from the construction of the improvements. Vandalism of heritage sites is considered an indirect effect possibly tied to recreation development by the increased access. However, this is not always a direct link. We have vandalism in areas where there is no recreation development. Vandalism, or looting, is against the law, and not part of our recreation program. The potential of increased vandalism or looting is considered when developing recreational sites. The Forest Service is addressing the looting problem through law enforcement and education.

Regarding research needs, the appendix in question is Appendix H of the Plan.

Regarding the comment regarding the Forest Archeologist making decisions for motorized recreation, horse and mountain bike use, the Forest Archeologist would make recommendations in coordination with recreation specialists. Decisions are made by line officers.

Any proposals for OHV use areas will go through the Section 106 process. In cases where National Register eligible sites are located, mitigation measures will be taken.

Structures proposed for demolition or removal will go through the Section 106 process.

Regarding the potential effects of Special Use Permits on heritage sites, this was a broad forest-wide comment and, generally speaking, our Special Use Projects have a low potential for impacts on heritage sites, through mitigation, project design or size. Any specific projects, going through the Section 106 process, would allow the Alabama Historical Commission to comment on specific projects.

Any development of recreational areas or trails will go through the Section 106 process. In instances where interpretation of the resources is the objective, increased *accessibility may be desired. Projects proposed will take into consideration potential effects to the heritage resources.*

In the introduction to General Effects, the comparison was made between private land and forest land. The point of the comparison, in general statements, was to point out that federal land is protected by federal laws. The list of effects will be edited to break out the indirect effect from the direct effect. It is not meant to be an exhaustive list.

The heading "Incomplete of Unavoidable Information" should have read "Incomplete or Unavailable Information." The change will be made.

The statement that there are no known potentially significant historical sites in Cheaha A is a statement of fact. There are no known sites. This does not mean that there are no sites in the area. The Evaluation of Roadless Areas for Wilderness Suitability addresses what was presently known and what was expected.

Special Management Prescriptions

6-59. Public Concern: The Forest Service should allocate the Management Prescription 4.D, Botanical Area, to several areas.

AND MANAGE FOR OLD GROWTH

Response: This comment refers to allocating specific areas to Management prescription 4D. Prescriptions are allocated to different areas in order to achieve management objectives for many resources. During the allocation process the ID Team had to balance the various resource needs and apply the prescription deemed most appropriate for the area. The revised Plan provides for the identification and protection of areas of botanical concern.

Management prescription 4.D. is generally compatible with old growth except in those areas where the species of significance requires another successional state for perpetuation.

6-60. Public Concern: The Forest Service should change the management prescription of several areas to 7.E.1, Dispersed Recreation.

Response: Prescriptions are allocated to different areas in order to achieve management objectives for many resources. Prescription 7.E.1 is generally described as management emphasis for Dispersed Recreation Areas and is unsuitable for timber management. Prescription 7.E.2 is generally described as management emphasis for Dispersed Recreation Areas and is suitable for timber management. Prescription 8.B is generally described as management emphasis for Early-Successional Habitat and is suitable for timber management. Where Dispersed Recreation emphasis areas have *been assigned a prescription that is suitable for timber management, timber management is compatible with the recreation management objectives of the areas.*

6-61. Public Concern: The Forest Service should overlay bear habitat with wilderness candidates.

Response: As part of the roadless areas evaluations, the evaluations should consider any species habitat associates or individual species with habitat needs within the roadless areas. This includes bear habitat. However, it should be noted that wilderness designations are not needed to maintain bear habitat.

6-62. Public Concern: The Forest Service should treat canyons as special geological areas.

Response: The canyon corridor prescription was developed to recognize the special attributes of the canyon corridor, including its geological attributes. Although the riparian corridor prescription would have precedence over the canyon corridor prescription where they overlap, this does not eliminate protections from the canyon prescription that are stricter than the riparian standards. The riparian standards would not apply to that part of the canyon corridor outside of the riparian corridor; canyon corridor standards would apply there.

6-63. Public Concern: The Forest Service should apply the canyon prescription to all canyons in the Bankhead National Forest.

Response: The Canyon Corridor Prescription has been clarified to explain that as canyons are identified on they ground, they will be added to the prescription, and the management requirements of the Canyon Corridor Prescription will apply. (Revised Plan, Chapter 3).

6-64. Public Concern: The Forest Service should identify where the canyon prescription should be applied.

Response: The Canyon Corridor Prescription has been clarified to explain that as canyons are identified on they ground they will be added to the prescription and the management requirements of the Canyon Corridor Prescription will apply. (Chapter 3)

6-65. Public Concern: The Forest Service should increase protection of habitat for cliff-associated wildlife.

Response: Cliffs and rock outcrops do receive increased protections in the revised Plan in the form of designations as Rare Communities and allocation to the Rare Community Prescription, as described in Chapter 3 of the revised Plan.

6-66. Public Concern: The Forest Service should upgrade the prescription of several areas on the Alabama National Forests.

Response: Developing a management plan for a national forest involves having to address a multitude of trade-offs. For the Southern Appalachian National Forests this includes trying to address 12 common issues, which are not necessarily compatible. An effort is made to find the mix of management activities that will best address all the issues. This means having a mix of areas where active management activities will be used to meet such issues as early-successional wildlife habitat needs, providing forest products, addressing forest health, etc. while other areas will be managed to provide late-successional wildlife habitat needs, and to meet social demands for things such as old growth areas, areas for backcountry recreation, scenic areas, wilderness areas, etc. However, in many of these areas in the later category, certain activities to meet forest health needs may still be allowed to occur. The interdisciplinary ID Team determined the application of prescriptions under compliance with the NEPA process.

6-67. Public Concern: The Forest Service should inventory, analyze, protect, and designate several areas.

Response: This comment refers to specific areas that the commenter suggests of designation as Roadless or be afforded additional protection. Alternative I was developed to address a multiplicity of issues, and many people, groups, and organizations were involved in its development. It was developed through iterations of working and meeting with our various publics, and we consulted with our partners in research throughout the process. During this time, areas were being evaluated for wilderness recommendation. The areas that best met the criteria for wilderness recommendation are reflected in Alternative I as released in the DEIS.

Other Special Designations

Wild, Scenic, and Recreational Rivers

6-68. Public Concern: The Forest Service should conduct a suitability analysis of several rivers for Wild and Scenic River designation.

Response: The Southern Appalachian Forests conducted an analysis of the rivers and streams on the forests as required by FSH 1909.12,8.14. This directs forests to study rivers and evaluate their eligibility for inclusion in the National Wild and Scenic Rivers System. The planning teams evaluate each river to verify that it meets the eligibility criteria specified in sections 1(b) and 2(b) of the Wild and Scenic Rivers Act. Documentation of the finding of eligibility or non-eligibility and the river's potential classification are included in the EIS.

Beyond this point, there is latitude in treatment of eligible rivers. The preferred process would be to proceed with determining suitability by completing a river study in the draft Forest Plan. However, most of our forests were unable to complete suitability at this time, and are delaying the suitability determination on eligible rivers until a subsequent separate study is carried out. In the interim, the revised Plans do provide for protection of the river area until a decision is made as to the future use of the river and adjacent lands.

6-69. Public Concern: The Forest Service should recommend several rivers for designation as a Wild and Scenic River.

Two mountains must be scaled before wild and scenic river status for a particular stream is recommended to Congress.

First is the mountain of eligibility. This mountain is not particularly tall, but it is very steep. All a stream needs to be eligible for wild and scenic status is to have one outstandingly remarkable value identified. The mountain is small because, of all the potential resource values, the river only needs one resource in one category to be declared eligible - and the declaration is only a value judgment. There are no hard and fast rules. But the mountain is also steep because merely having a remarkable value is not enough. Having an outstanding value is not enough either. The value must be considered "outstandingly remarkable". This is a high bar, and the measurement of success is not absolute. It is only a judgment.

Second is the mountain of suitability. This is a more rigorous evaluation. A stream with an outstandingly remarkable, or several outstandingly remarkable values, may or may not be considered suitable for inclusion in the wild and scenic river system. If deemed not suitable, then the river is not recommended to Congress for their consideration.

Rivers deemed eligible must have their outstandingly remarkable values fully protected until a suitability study is completed. The outstandingly remarkable values will continue to be protected for all rivers found to be suitable. However, if considered unsuitable for inclusion, the outstandingly remarkable attributes must depend on other systems for protection.

The suitability study for Five Runs on the Conecuh National Forest has yet to be done. That is why the Five Runs Study is Plan Objective 24.1.

Brushy Fork, Terrapin Creek, and Yellow River were not judged to have an outstandingly remarkable value.

6-70. Public Concern: The Forest Service should properly evaluate all rivers that qualify under the Wild and Scenic Rivers Act.

Response: The comment refers to specific rivers and none of the rivers listed of concern flow in Alabama.

6-71. Public Concern: The Forest Service should rewrite a wild and scenic rivers objective to develop a management plan for each wild and scenic river by 2010.

Response: The only Wild and Scenic river on the National Forest in Alabama is the Sipsey Wild and Scenic river and there is management plan for this river. Five Runs has been determined eligible for Wild and Scenic river designation; however, the suitability study for this river has not been done. The revised Plan has an objective to complete the suitability study. A management plan would not be developed, until a suitability study has been completed, the river is determined suitable and the river is designated a Wild and Scenic river.

Other Special Designations or Management Prescriptions

6-72. Public Concern: The Forest Service should include detailed discussions of why certain management prescriptions were developed, what were their goals, and why they were not included in the preferred alternative.

Response: Rationale for the determination of the selected alternative in the Final EIS is contained in the Record of Decision. Here is where the decision for the Revised Plan to be implemented is explained in terms that tell the reader why one alternative is favored over others. The Alternatives, early on in the process, were designed from the ground up. Working with the public, some thematic outlines were developed and then, the prescriptions built and applied in logical groupings that matched the alternative themes. The resulting alternatives are displayed in the EIS. The Preferred Alternative could not include all of the prescriptions, nor did we want it to. The Desired Condition; however, is to be created by application of the prescriptions chosen.

Lands

Landownership (General)

6-73. Public Concern: The Forest Service should support private property rights.

Response: The revised Plan provides the direction for managing National Forest Lands. The EIS must consider the effects that implementing the alternatives would have on private land, and the revised Plan includes measures to mitigate off-site effects. However, the revised Plan does not affect private property rights.

Forest Plans do not have any jurisdiction over private property. Forest Plans do not override property law in regards to access to private property or land use on private property. The National Forests in Alabama strive to be good neighbors with adjacent landowners.

6-74. Public Concern: The Forest Service should consider private property rights when making management decisions.

Response: The revised Plan provides the direction for managing National Forest Lands. The EIS must consider the effects that implementing the alternatives would have on private land, and the revised Plan includes measures to mitigate off-site effects. However, the revised Plan does not affect private property rights.

No new wilderness study areas were recommended on the Bankhead National Forest. The National Forests in Alabama strive to be good neighbors with adjacent landowners. Effects on adjacent land are part of project-level analysis.

6-75. Public Concern: The Forest Service should survey and inventory all National Forest lands in Alabama.

Response: Section 110 of the National Historic Preservation Act directs the Forest Service to inventory its lands for heritage resources.

Lands Acquisition by Agency

6-76. Public Concern: The Forest Service should not take away any additional private property.

Response: The Lands Acquisition Program is described in chapter 3 section C subsection 6 of the DEIS. Land purchase and land exchange programs are the methods by which additional lands are acquired. Prior to exchange or purchase, a site-specific evaluation and decision is completed.

6-77. Public Concern: The Forest Service should acquire Bureau of Land Management land near the Blue Mountain area.

Response: Setting specific priorities for the Lands Acquisition Program is not a Plan level decision, but rather a site-specific decision.

6-78. Public Concern: The Forest Service should look for opportunities to acquire property that would benefit the environment.

Response: The Lands Acquisition Program is described in chapter 3, section C, subsection 6 of the EIS, and strives to meet environmental needs and to improve efficiency.

6-79. Public Concern: The Forest Service should use eminent domain and compelling public interest to seize all Bowater/Hiawassee Land Co. and International Paper land.

Response: While this view is appreciated, it is not something within the purview of the Forest Land Resource Management Plan.

Land Exchanges and Disposal

6-80. Public Concern: The Forest Service should ensure that land exchanges will not lead to degradation or coal mining.

Response: Land exchange cases must comply with agency policy and direction, Forest Land Management Plans and applicable laws including the National Environmental Policy Act. The land exchange decision is a determination by the authorized officer if the public interest is well served by exchanging federal and private interests in land, not to approve or disallow specific activities following completion of the exchange.

Although reasonably foreseeable actions and cumulative effects are considered in the analysis to come to a reasoned decision on public interest, once the exchange is completed, the federal lands are managed under private ownership in accordance with their highest and best use and in accordance with local zoning, municipal code and state and federal regulations. Private lands are managed in accordance with Forest Land Management Plans. Coal mining is an acceptable form of energy extraction in all states and its methods and impacts are highly regulated by multiple state and federal agencies both on federal lands and on private lands. Forest Service policies, practice and procedure is to avoid regulating private property use through the use of reservations except where clearly shown to be in the public interest or required under federal law. Outstanding mineral rights on federal lands are fully recognized in the conveyance deed to the private exchange party and are beyond the control of the federal agency.

Chapter 7

Natural Resources Management

Resource Management Guiding Philosophy

Management Philosophy General

7-1. Public Concern: The Forest Service should manage lands for environmental preservation, protection, and restoration.

Many commenters expressed a desire to see national forests managed for maintenance and restoration of "natural conditions" to support healthy ecosystems, clean water, and abundant wildlife, as opposed to an emphasis on resource extraction. We feel the revised Plan is in line with these priorities. Within the Southern Appalachian region, vegetation management will be driven by the need to create desired ecological conditions, not to meet resource extraction goals. These Plans clearly focus on the ecological conditions left on the ground, not on resources removed. Although timber production emphasis prescriptions were defined during planning, none have been included under the preferred alternative. All prescriptions used emphasize ecological restoration, recreation, or special area protection.

This emphasis does not mean that there will be no commercial timber sales implemented under the revised Plan. Timber sales are one of the most important and efficient tools we have for creating desired conditions on the ground. To use this tool effectively, in most cases we designate individually which trees are to be cut and which are to be retained, and carefully administer the sale to ensure disturbance to soil, water, and remaining trees is within specified limits. This approach is not only effective, it is efficient: by selling cut trees, we generate revenue rather than paying for the service. An added benefit is that sold material is used and generates economic activity within surrounding communities.

7-2. Public Concern: The Forest Service should acknowledge the value of the forest for non-extractive uses.

Response: Option values and existence values are not items suggested to be discussed under 36 CFR 219. These highly controversial methodologies can be of a contentious nature with many publics. The Forest Service has chosen not to use values based on questionable and controversial methodologies and values not specifically required by Forest Service directives.

7-3. Public Concern: The Forest Service should allow local staff to manage forests based on science.

The Plan outlines goals and objectives for forest health and ecosystem restoration. The DFC along with the standards provide the framework for management of the forest, however, site-specific projects at the local level by local staff will implement the Plan. These site-specific analyses will determine, based on site conditions, the appropriate activities to meet the goals and objective outlined in the Plan.

Multiple Use Management

7-4. Public Concern: The Forest Service should actively manage National Forest System lands in a manner that provides multiple use benefits for all Americans.

Response: The planning process for the Southern Appalachians included analysis of a range of alternative management themes. The Plan makes strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC.

Ecosystem Management

7-5. Public Concern: The Forest Service should acknowledge that ecosystem management leads to human exclusion and a lack of management.

Response: Ecosystem management is an approach to natural resource management to assure productive, healthy ecosystems by blending social, economic, physical, and biological needs and values. Several of the alternatives considered in the EIS include active management and none exclude humans.

Adaptive Management

7-6. Public Concern: The Forest Service should increase its pursuit and use of adaptive management.

TO DEVISE OPTIONS IN RESPONSE TO ENVIRONMENTAL CHANGES

Response: During implementation of the Plan, monitoring will provide the opportunity to respond to changing conditions. The planning process includes the opportunity to amend or supplement the decision as new information and technologies become available.

Monitoring and Evaluation

7-7. Public Concern: The Forest Service should clarify the monitoring and evaluation of rare communities.

Response: Monitoring and evaluation are discussed in Chapter 4 of the Plan.

7-8. Public Concern: The Forest Service should ensure adequate monitoring and evaluation.

FOR OLD GROWTH

FOR SPECIAL AREAS

Response: Monitoring and evaluation are discussed in Chapter 4 of the Plan.

7-9. Public Concern: The Forest Service should seek additional funding to conduct monitoring.

Response: Funding is clearly a limiting factor for monitoring as well as any other activity of forest management. Funding needs for the monitoring of this Plan will be assessed and planned on the Forest in the initial year of implementation and for each subsequent year. Funding needs will be reported to the President for agency budget formulation. Funding levels ultimately are the purview of Congress and the President.

Additional actions that are being taken and continually explored to stretch available funds and provide for monitoring needs include:

Application of remote sensing, geographic information systems, and expanded data analysis capacity

Utilization of information provided by other agencies

Partnerships with agencies, universities, and professional organizations

Utilizing qualified volunteers to supplement the agency workforce

Monitoring Task Sheets will be developed to utilize these resources to extend the agency capacity to monitor the effectiveness of the Plan. Annual review and adjustment to the Monitoring Task Sheets will provide for changes needed due to technological advances, shifts in funding and priorities, workforce changes, and new opportunities for cooperation. Research needs will be identified and updated each year for additional effectiveness and validation needs that exceed the monitoring program itself.

7-10. Public Concern: The Forest Service should expand monitoring guidelines to ensure data quality and ensure that monitoring is communicated to the public.

Response: NFMA regulations specify that monitoring requirements identified in the revised Plan shall provide for:

(1) A quantitative estimate of performance comparing outputs and services with those projected by the revised Plan;
(2) Documentation of the measured prescriptions and effects, including significant changes in productivity of the land; and
(3) Documentation of costs associated with carrying out the planned management prescriptions
4) A description of the following monitoring activities:
(i) The actions, effects, or resources to be measured, and the frequency of measurements;
(ii) Expected precision and reliability of the monitoring process; and
(iii) The time when evaluation will be reported.
(5) A determination of compliance with the following standards:
(i) Lands are adequately restocked as specified in the revised Plan;
(ii) Lands identified as not suited for timber production are examined at least every 10 years to determine if they have become suited; and that, if determined suited, such lands are returned to timber production

Public concern expressed seems to focus on the adequacy of the Monitoring Plan in meeting provisions 2 and 4 above. The Monitoring Summary Table provides a matrix that relates the measured goals and objectives described in detail in earlier chapters of the Plan to the monitoring activities described as monitoring questions, elements, general methods, duration/frequency, reporting intervals, precision, reliability and responsibility. More specific protocols, methods, sampling intensities, and locations to be applied in completing the described monitoring activities, which are frequently questioned in public comments, are covered in Monitoring Task Sheets outside the Plan.

Plan implementation will be accomplished through projects, which must comply with the Plan. Project planning and monitoring is done to assure that work is accomplished in compliance with the Plan. Periodic reviews of projects assure that these requirements are being met. Additionally a Monitoring and Evaluation report is prepared annually and is available to the public.

7-11. Public Concern: The Forest Service should conduct monitoring under peer-review to ensure data quality.

Response: Most of the monitoring elements described in the Monitoring Summary Tables in Appendix F of the revised plan will be (and have been) done in cooperation *with partners. State agencies, research entities, private contractors, and Forest Service employees all are utilized to gather the data presented in the annual Monitoring and Evaluation plan. Also see response to pc # 7-10 above.*

7-12. Public Concern: The Forest Service should form partnerships for conducting monitoring and sharing costs and knowledge.

Response: The Forest Service does indeed form partnerships for conducting monitoring and sharing costs and knowledge when available.

7-13. Public Concern: The Forest Service should require appropriate monitoring and record maintenance.

Response: Our intent is that rare communities will be given high priority for maintenance and restoration wherever they occur on the forest. To accomplish this intent, it is clear that we will need to improve our inventories of rare communities as the Plan is implemented. We will improve rare community inventories through a variety of approaches, including project-level surveys where needed to ensure maintenance or restoration of rare communities. As rare communities are located and mapped, they will automatically be allocated to the Rare Community prescription, unless or until such allocation would result in a substantial impact to achievement of conditions and outputs envisioned in the Plan. The Plan indicates that rare communities will be monitored for number and acreage of occurrence, condition (which includes presence of rare species), management needs, and management accomplishments. This focus will ensure that rare communities continue make a critical contribution to community and species diversity on the forest. Monitoring and record maintenance is a part of this process.

7-14. Public Concern: The Forest Service should develop better develop the Monitoring and Evaluation Plan in Chapter 5 of the PRLMP.

Response: NFMA regulations specify that monitoring requirements identified in the revised Plan shall provide for:

> *(1) A quantitative estimate of performance comparing outputs and services with those projected by the revised Plan;*
> *(2) Documentation of the measured prescriptions and effects, including significant changes in productivity of the land; and*
> *(3) Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the revised Plan.*
> *(4) A description of the following monitoring activities:*
>> *(i) The actions, effects, or resources to be measured, and the frequency of measurements;*
>> *(ii) Expected precision and reliability of the monitoring process; and*
>> *(iii) The time when evaluation will be reported.*

(5) A determination of compliance with the following standards:
(i) Lands are adequately restocked as specified in the revised Plan;
(ii) Lands identified as not suited for timber production are examined at least every 10 years to determine if they have become suited; and that, if determined suited, such lands are returned to timber production

Public concern expressed seems to focus on the adequacy of the Monitoring Plan in meeting provisions 2 and 4 above. The Monitoring Summary Table provides a matrix that relates the measured goals and objectives described in detail in earlier chapters of the Plan to the monitoring activities described as monitoring questions, elements, general methods, duration/frequency, reporting intervals, precision, reliability and responsibility. More specific protocols, methods, sampling intensities, and locations to be applied in completing the described monitoring activities, which are frequently questioned in public comments, are covered in Monitoring Task Sheets outside the Plan.

Plan implementation will be accomplished through projects, which must comply with the Plan. Project planning and monitoring is done to assure that work is accomplished in compliance with the Plan. Periodic reviews of projects assure that these requirements are being met.

Natural Resources Management

Natural Resources Management General

7-15. Public Concern: The Forest Service should end commercial resource development activities.

Response: The Southern Appalachian Plans do not make direct decisions about whether or not commercial resource activities, per se, will or will not exist on National Forest lands. Rather, these Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC.

7-16. Public Concern: The Forest Service should emphasize needs of future generations over commercial uses.

Response: The Plan outlines goals and objectives for forest health and ecosystem restoration. Implementation of the Plan will provide for present and future generations.

7-17. Public Concern: The Forest Service should ensure that all management actions are conducted in an environmentally sensitive way.

TO PREVENT NEGATIVE ENVIRONMENTAL EFFECTS

Response: The EIS documents the analysis to determine the effect of the alternatives on the environment. Goals, objectives, and standards in the Plan provide the framework for implementation of the selected alternative in a way that prevents or mitigates negative effects.

7-18. Public Concern: The Forest Service should manage each ecosystem as a unique component based on science instead of a 'one size fits all' approach.

BECAUSE FOREST ECOSYSTEMS VARY ACROSS LANDSCAPES

Response: For the National Forests in Alabama, the management areas are each major division of land. Because these have unique ecosystem components, the management prescriptions were applied to them differently as well as modified to fit the local situation. The revised Plan maps display how the management prescriptions were applied to each management area. In addition, forest-wide standards were developed (Plan chapter 2) that would apply to all areas of the forest as well as standards for management prescriptions (Plan chapter 3) where the additional protections were necessary.

7-19. Public Concern: The Forest Service should not allow timber harvest and ATV use on national forests.

BECAUSE THE FORESTS SHOULD BE PRESERVED

TO AVOID ECOLOGICAL HARM AND NOISE

Response: Developing a management plan for a national forest involves having to address a multitude of trade-offs. For the Southern Appalachian National Forests this includes trying to address 12 common issues, which are not necessarily compatible. An effort is made to find the mix of management activities that will best address all the issues. This means having a mix of areas where active management activities will be used to meet such issues as early-successional wildlife habitat needs, providing forest products, addressing forest health, etc. while other areas will be managed to provide late-successional wildlife habitat needs, and to meet social demands for things such as old growth areas, areas for backcountry recreation, scenic areas, wilderness areas, etc. However, in many of these areas in the later category, certain activities to meet forest health needs may still be allowed to occur.

Restoration

7-20. Public Concern: The Forest Service should restore natural processes and native forest communities.

Response: Restoration, as a management issue, was developed as several management prescriptions (depending on which ecosystem attribute needed restoration) that were allocated to Forest areas where the need was of high potential. Each restoration prescription does define desired future condition in terms of native species composition.

Some restoration needs will involve the removal of timber. Timber sales are one of the most important and efficient tools we have for creating desired conditions on the ground. To use this tool effectively, in most cases we designate individually which trees are to be cut and which are to be retained, and carefully administer the sale to ensure disturbance to soil, water, and remaining trees is within specified limits. This approach is not only effective, it is efficient: by selling cut trees, we generate revenue rather than paying for the service. An added benefit is that sold material is used and generates economic activity within surrounding communities.

7-21. Public Concern: The Forest Service should more clearly define what is meant by "restoration".

Response: Restoration, as a management issue, was developed as several management prescriptions (depending on which ecosystem attribute needed restoration) that were allocated to Forest areas where the need was of high potential. Each restoration prescription does define desired future condition in terms of native species composition. There are some restoration needs that will involve the removal of loblolly pine where it is growing off site, and restoring the site to longleaf pine, for example (Management prescription 9.D.).

7-22. Public Concern: The Forest Service should conduct ecological restoration without commercial timber harvest.

Response: Timber sales are one of the most important and efficient tools we have for creating desired conditions on the ground. To use this tool effectively, in most cases we designate individually which trees are to be cut and which are to be retained, and carefully administer the sale to ensure disturbance to soil, water, and remaining trees is within specified limits. This approach is not only effective, it is efficient: by selling cut trees, we generate revenue rather than paying for the service. An added benefit is that sold material is used and generates economic activity within surrounding communities.

Standards, Goals, Objectives, and Guidelines

7-23. Public Concern: The Forest Service should provide clear, concise, and unambiguous management objectives.

Response: We agree that management objectives should be clear, concise, and unambiguous.

Management Prescriptions

7-24. Public Concern: The Forest Service should clarify the goals and management objectives of Management Prescription 9.D, 9.G.1, and 4.D.

Response: The goal and management objective of management prescriptions 9D, and 4D are described in Chapter 3 of the Plan. Any site-specific decisions will be consistent with the direction in the Plan for the appropriate management area.

The description and emphasis for management prescription 9G has been added to Chapter 3 of the Plan.

7-25. Public Concern: The Forest Service should clarify the goals and management objectives of Management Prescription 10.D and 4.C.

Response: The emphasis and desired condition for Management prescriptions 10D and 4C are described in Chapter 3 of the Plan. The objective of Management area 10D is to provide range and forage within managed allotments.

The primary desired outcome of management is a public understanding of, and appreciation for, the influence of geology in the ecology and human history of the larger land area being represented by the designated geologic area.

Timber Resource Management (General)

Timber Resources Management General Considerations

7-26. Public Concern: The Forest Service should harvest timber from National Forest System lands.

Response: Indeed, the selected alternative for the Southern Appalachian Plans does contain goals and objectives that will be accomplished by the activity of timber harvesting.

7-27. Public Concern: The Forest Service should develop alternatives and management prescriptions that emphasize timber management.

TO IMPROVE FOREST AND ECOSYSTEM HEALTH

TO FULFILL AGENCY MANDATES AND AVOID SETTING A PRECEDENT FOR RESOURCE PLANNING

Response: The Plan outlines goals and objectives for forest health and ecosystem restoration. Timber harvesting is one tool that is available to accomplish these goals and objectives. The DFC along with the standards provide the framework for management of the forest, however, site-specific projects will implement the Plan.

These site-specific analyses will determine, based on site conditions, the appropriate methods for timber harvest, site preparation, prescribe burning, and other treatments as needed.

7-28. Public Concern: The Forest Service should not harvest timber from National Forest System lands for various reasons.

BECAUSE THIS ACTIVITY ADVERSELY AFFECTS WILDLIFE AND HABITAT

BECAUSE TIMBER SHOULD BE SUPPLIED BY PRIVATE LANDOWNERS

BECAUSE TREE FARMS BELONG ON PRIVATE LANDS

Response: The selected alternative for the Southern Appalachian Plans does contain goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). These Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC. A minimum management (custodial) alternative was developed, but was not studied in detail due to its failure to meet the mandates of NFMA and the MUSYA.

7-29. Public Concern: The Forest Service should not harvest timber from National Forest System lands in various locations.

Response: The selected alternative for the Southern Appalachian Plans does contain goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). These Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC. A minimum management (custodial) alternative was developed, but was not studied in detail due to its failure to meet the mandates of NFMA and the MUSYA.

7-30. Public Concern: The Forest Service should not conduct commercial timber harvest on National Forest System lands.

IN MANAGEMENT PRESCRIPTIONS 2.A.2 AND 2.C

TO PROTECT WATERSHEDS

Response: The Plan outlines goals and objectives for forest health and ecosystem restoration. Timber harvesting is one tool that is available to accomplish these goals and objectives.

7-31. Public Concern: The Forest Service should not manage National Forest System lands as tree plantations and tree farms.

Response: Management of these Forests as ecosystems is a major theme under which the management prescriptions were developed. The emphasis and desired future condition for each management prescription took into consideration the successional and structural diversity needs of the landscape.

7-32. Public Concern: The Forest Service should not increase timber harvest.

Response: The planning process for the Southern Appalachians included analysis of a range of alternative management themes. Within these alternatives was a range of levels of timber harvest volumes. The selected alternative does not have the highest level of timber harvest, but addresses the spectrum of significant issues best in its combination of resource activities and emphases.

7-33. Public Concern: The Forest Service should clarify the timber management program.

Response: The Plan outlines goals and objectives for forest health and ecosystem restoration. Timber harvesting is one tool that is available to accomplish these goals and objectives. The DFC along with the standards provide the framework for management of the forest, however, site-specific projects will implement the Plan. These site-specific analyses will determine, based on site conditions, the appropriate methods for timber harvest, site preparation, prescribe burning, and other treatments as needed.

7-34. Public Concern: The Forest Service should adequately examine the effects of the timber harvest program.

Response: The effects of all proposed activities, including timber harvesting, are examined for each alternative in the Final Environmental Impact Statement for each of the Southern Appalachian Plans.

7-35. Public Concern: The Forest Service should clarify timber harvest provisions under specific management prescriptions and standards.

Response: Forest-wide standards in Chapter 2 Plan contain provisions for timber harvest that apply to all the prescriptions. Additional standards that only apply to a particular management prescription follow the description of that prescription in Chapter 3 for the Plan.

7-36. Public Concern: The Forest Service should better define and analyze allowable silvicultural techniques.

Response: The description of silvicultural techniques is in the FEIS Appendix E – Vegetation Management Practices. This description identifies the range of appropriate silvicultural regeneration methods the may be used in each forest community.

7-37. Public Concern: The Forest Service should evaluate isolated parcels where private land use is dominant differently than larger contiguous parcels in determining amount of harvest.

AND NOT LUMP THE SMALLER TRACTS TOGETHER ACROSS 10,000 ACRES OR MORE

Response: The revised Plan provides a framework for management, but does not make site-specific decisions. Site-specific decisions at the local level will determine activities on isolated parcels.

7-38. Public Concern: The Forest Service should clarify how silvicultural activities intended for ecological management can provide a stable supply of wood products.

Response: The desired conditions of the management prescription allocations defined the interactions of the various resources, and what types of actions were compatible or incompatible with each other. Different models were then used to estimate the outcomes of meeting these desired conditions. Spectrum was just one of the tools used in this analysis. SPECTRUM was used to estimate what kind of outputs would result from meeting the desired conditions of the management prescription allocations. Some of these desired conditions specified that certain percentages be maintained in certain age classes or "structural" conditions. In order to maintain these conditions, silvicultural activity would need to occur on a regular basis, and this is what would provide a "stable supply" of products.

In terms of the differences between alternatives, each alternative had an overall "theme". This "theme" was then used as a "guide" to determining the allocations of the management prescriptions. However, land managed under, say, Management Prescription 4.F. in Alternative A, is the same as land managed under Management Prescription 4.F. in Alterative G. It is the land allocation of the management prescriptions that makes up the differences between the alternatives, not the management activities within a particular management prescription.

Forest Composition

Forest Composition General

7-39. Public Concern: The Forest Service should manage forests to create a diversity of successional stages, stand structures, and species.

Response: Management of these Forests as ecosystems is a major theme under which the management prescriptions were developed. The emphasis and desired future condition for each management prescription took into consideration the successional and structural diversity needs of the landscape.

Forest Species Composition

7-40. Public Concern: The Forest Service should explain the rationale for not including longleaf pine restoration areas in the preferred alternative.

Response: The revised Plan, chapter 2, discusses ecosystem restoration including longleaf pine restoration. Chapter 3 of the revised Plan discusses the emphasis and desired conditions of several management prescriptions (7E2, 8D1, 9D, 9D1, 9C3) that include restoration of native ecosystems including longleaf pine. The revised Plan does not include discussion of current, ongoing, or future site-specific projects.

7-41. Public Concern: The Forest Service should explain why in the preferred alternative 55% of the cypress-tupelo habitats on the Conecuh NF are in early successional stage.

AND THE OTHER ALTERNATIVES SHOW NONE IN THIS STAGE

Response: Conecuh National Forests' Cypress-Tupelo Swamp forest was reported in error in the Draft EIS. The commenter is correct in pointing out that the section's narrative points out that "the primary management recommendation is that of protection" for this habitat type. The figures have been corrected in the FEIS Chapter 3B, section 1.9.

Forest Species Classification and Distribution

7-42. Public Concern: The Forest Service should conduct natural and artificial regeneration of pine, pine/hardwood, and hardwood forests.

Response: The Plan does allow for natural and artificial regeneration of pine, pine/hardwood and hardwood forests.

7-43. Public Concern: The Forest Service should support deciduous forests in the Southern Appalachian.

Response: The Plan emphasizes the restoration and maintenance of native ecosystems including deciduous forests.

7-44. Public Concern: The Forest Service should define 'restoration' of native species and take action to remove loblolly pines.

TO ACHIEVE HARVEST LEVELS

TO RESTORE NATURAL LONGLEAF PINE ECOSYSTEMS

Response: Restoration, as a management issue, was developed as several management prescriptions (depending on which ecosystem attribute needed restoration) that were allocated to Forest areas where the need was of high potential. Each restoration prescription does define desired future condition in terms of native species composition. Some restoration needs will involve the removal of loblolly pine where it is growing off site, and restoring the site to longleaf pine, for example (Management prescription 9.D.).

7-45. Public Concern: The Forest Service should not expand loblolly pine plantations in Alabama National Forests.

Response: Thank you.

7-46. Public Concern: The Forest Service should not include pine plantations in the definition of restoration.

Response: Planting of tree seedlings may be necessary to restore an area to native vegetation and is allowed in the revised Plan. However, a site-specific decision will be made to determine where planting will occur.

7-47. Public Concern: The Forest Service should plant hardwoods in longleaf pine stands.

Response: Site-specific decision will determine areas to be planted and the appropriate species to plant. The revised Plan is a strategic document rather than a site specific one.

Late Successional/Old Growth

7-48. Public Concern: The Forest Service should actively manage old growth forests.

BECAUSE MANAGING FOR OLD GROWTH WILL CREATE HEALTH PROBLEMS IN THE FUTURE

Response: The regional guidance for conserving and restoring old growth forest communities outlines different approaches for managing old growth, which includes options from "doing nothing" to active management regimes of extended forest rotations designed to sustain a flow of replacement old growth stands over time. These options are reflected in Management Prescriptions 6.A. through 6.E. The forest *management teams and interdisciplinary teams considered these options in determining which approaches would best address the old growth management issue. In addition to those areas allocated to a Management Prescription 6 Category, other areas allocated to other Management Prescriptions will also provide future old growth stands.*

Developing a management plan for a national forest involves having to address a multitude of trade-offs. For the Southern Appalachian National Forests this includes trying to address 12 common issues, which are not necessarily compatible. An effort is made to find the mix of management activities that will best address all the issues. This means having a mix of areas where active management activities will be used to meet such issues as early-successional wildlife habitat needs, providing forest products, addressing forest health, etc.; while other areas will be managed to provide late-successional wildlife habitat needs, and to meet social demands for things such as old growth areas, areas for backcountry recreation, scenic areas, wilderness areas, etc. However, in many of these areas in the later category, certain activities to meet forest health needs may still be allowed to occur.

7-49. Public Concern: The Forest Service should protect old growth forests.

FOR BIODIVERSITY AND DIVERSE ECOSYSTEMS

TO BENEFIT BEES, BIRDS, AND OTHER WILDLIFE, PLANTS, AND VALUED ELEMENTS

FOR STUDY AND THE FUTURE

BECAUSE THERE ARE FEW AREAS OF OLD GROWTH REMAINING

BY ESTABLISHING STANDARDS TO IDENTIFY AND PROTECT OLD GROWTH PATCHES

Response: See response to PC 7-48.

7-50. Public Concern: The Forest Service should specify desired future conditions, objectives, and standards for all old growth in management prescriptions.

Response: The old growth section in Chapter 2 of the Plan discusses management of old growth. The emphasis and DFC of the management prescriptions describe old growth compatibility.

7-51. Public Concern: The Forest Service should follow regional guidance regarding old growth.

Response: The regional old growth guidance provides information on how to identify existing old growth areas, different options for managing old growth, and an overall approach for addressing old growth during forest planning. The Forests have followed this guidance by conducting an inventory of possible old growth and using this as a *guide in the development of the different alternatives. The revised Plans include a standard that any stands identified as "existing old growth" will be protected, and the Plans provide a network of old growth areas across the forest. This "network" does not have to consist only of areas allocated to a Management Prescription 6. There are many management prescriptions that will allow stands to eventually provide old growth conditions and these areas are a part of the overall "network". The FEIS chapter 3B section 3.3, discusses existing and future old growth for all the alternatives.*

7-52. Public Concern: The Forest Service should accurately describe the historic dynamics of the Southern Appalachian forests as naturally uneven-aged.

AND CONSIDER AN ALTERNATIVE TO RESTORE THE SOUTHERN APPALACHIAN FORESTS TO THEIR NATURAL DYNAMICS

AND CONSIDER NATURAL GAP-PHASE REGENERATION

BECAUSE THE SPECIES VIABILITY ANALYSIS PERPETUATES THE FLAWED PREMISE THAT SOUTHERN APPALACHIAN FORESTS ARE SUCCESSIONAL FORESTS

Response: Several commenters questioned the appropriateness of the even-aged successional model inherent in the Successional Forest Options incorporated in the Revised Plan. They frequently cited materials raised in a paper by a forest specialist that contend that Southern Appalachian forests are naturally uneven-aged, and regenerate predominately through "gap-phase dynamics" rather than by larger, more severe disturbances. Some commenters fault the Forest Service for not considering this information.

Contrary to assertions made by some commenters, information compiled by the specialist was considered during planning. It was distributed to staffs of all Southern Appalachian forests undergoing revision, and was reviewed by planners at the forest and regional levels. Points of agreement and disagreement were discussed at varying levels across these forests. There are many points of agreement, which are corroborated by a predominance of mainstream scientific literature. We agree that some major forest types in the Southern Appalachians are low disturbance systems that commonly regenerate through natural development of relatively small canopy gaps, and that frequent fire in these systems is not desirable. These areas of agreement are incorporated in the Revised Plan and EIS through direction and analysis for mesic deciduous forests, which include cove, riparian, mixed mesophytic and northern hardwood forests. This direction and analysis considers the amount of these forests allocated to Forest Successional Options 1 and 2 (which should be dominated by gap-phase processes), the need for canopy gaps within these forests, and the limited role of fire (cite Mesic Deciduous Forest Section of EIS, and appropriate objectives and standards from the Plan). There are, however, some conclusions with which we disagree, as do some members of the academic and research communities with whom we have consulted.

The specialist's presentation of forest conditions in the late 1800s and early 1900s depends heavily upon the Ashe and Ayers Report and descriptions contained in the field notes and maps of the tracts of land that were acquired for inclusion in the National Forests. The specialist also provided substantive literature (bibliography) to support his views. However, he rejects or ignores the substantial body of scientific literature (much of it published in the last 10 years) that contradicts his conclusions regarding the role of fire and other disturbance in maintaining upland oak and pine forest types.

Unlike the scientific literature used and cited during planning, the specialist's analysis has not been through the rigorous process of peer review, critique, and publication in mainstream scientific journals. The Forest Service contracted review of the specialist's analysis by Paul and Hazel Delcourt of the University of Tennessee, who have published widely on historical disturbance ecology. Their written review indicates areas of agreement and disagreement similar to those identified by forest planning teams. It also is important to note that the forest specialist is not an ecologist or forester, professions that are educated and trained to make ecological interpretations of forest condition data. In his paper, use of terms, lack of reference to the most current scientific literature, and resulting conclusions often do not reflect the best available science. Based on these considerations, we believe the analysis was given an appropriate level of consideration during planning.

Although understanding historical and pre-European settlement conditions provides an important context for conservation planning, restoring such conditions is not an overriding objective or legal requirement for Plan revision. In most cases, ecological conditions have changed too much for this to be feasible, let alone desirable. Plan direction represents a decision on multiple-use management informed by the best science on disturbance ecology, not an attempt to recreate historical conditions.

Based on synthesis of the scientific literature, our understanding is that Southern Appalachian forests historically have been subject to highly variable disturbance regimes across the landscape. This variation resulted from the interaction of fire, wind, and other disturbance factors with the highly variable topography and edaphic conditions of the mountains. We disagree with the specialist, and follow most current scientific literature in recognizing that fire, primarily of Native American origin, played an important role in maintenance of upland pine and oak forests, and open woodlands, savannas, and grasslands. Compared to today, forest structure was likely more open on upland sites due to the influence of fire, and more heterogeneous on lower slopes and coves, due to gap-phase dynamics of older forests. Overall, within-stand structures were likely variable due to the variable effects of natural disturbance factors. Many areas would not easily be categorized as either even-aged or uneven-aged, but some level and pattern of older residual overstory trees would almost always be present, even in areas providing important early-successional habitat. This variable structure can be approximated with uneven-aged, two-aged, and even traditional even-aged management systems, all of which involve retention of varying levels of overstory *structure. A patchwork of uniform even-aged stands established by clean clearcuts is clearly outside the historical range of variation of forest structure and is also clearly not the desired condition for any portion of the national forest.*

Although the Revised Plan includes objectives for restoration of native fire-maintained habitats, we recognize that we will not be able to restore the influence of fire to the landscape to historical levels due to a variety of logistical and social reasons. Creation of early-successional forests can compensate for the loss of open fire-maintained habitats for some species. So, although we recognize that the mix of types of early-successional habitats maintained under the Revised Plan cannot reflect historical conditions, we have considered the overall abundance of these habitats within an historical ecological context to arrive at objective levels. As some of these fire-maintained habitats are restored, need for early-successional forest as habitat for some species will decline. However, need will not disappear; other species, such as ruffed grouse, depend upon the dense woody growth found in early-successional forests. In addition, other multiple-use considerations, such as need for habitat to support game species for recreation, ecological restoration of native forests, forest health considerations will continue to make creation of some level of early-successional forest desirable.

7-53. Public Concern: The Forest Service should inventory and map old growth.

Response: One of the objectives in the Plan (Chapter 2) is to complete field verification of possible existing old growth areas in our current inventory, and map small and medium patches.

7-54. Public Concern: The Forest Service should adequately map and display the networks of large, medium, and small old growth patches.

Response: See response to PC 7-51. In addition, maps of current possible old growth have been added to the EIS chapter 3b.

7-55. Public Concern: The Forest Service should manage timber in Special Study Areas for old growth.

TO ENHANCE TRADITIONAL CULTURAL EXPERIENCES

Response: The descriptions of the management prescriptions in chapter 3 of the Plan indicate which areas will contribute to old growth.

7-56. Public Concern: The Forest Service should explain why only the Jefferson National Forest documents "existing old growth".

Response: The Forests in the Southern Appalachians are in different situations in terms of their old growth inventories of "existing old growth", with some further along than others. Inventories from other groups/organizations can be presented to the Forests, but they still need to be verified that they meet the criteria for old growth as spelled out in the regional old growth guidance.

Since these inventories are generally at the stand level, they are not allocated to specific management prescriptions in the revised Plan. Instead, it is recognized that these stands could occur in any management prescription allocation, and in order to protect those stands of existing old growth, a forest-wide standard is included in the revised Plan to provide that protection. This standard applies to both those stands currently identified as existing old growth, as well as any stands that may be identified in the future as meeting the criteria for "existing old growth". So even though a Forest may not have a completed inventory now, any project level evaluation will have to see if any of the stands proposed for management activities meet the old growth definition.

7-57. Public Concern: The Forest Service should clarify when old growth identification will happen on the Alabama National Forests.

Response: Clarification for the identification of old growth is presented in Chapter 3b of the EIS and in forest-wide direction in chapter 2 of the Plan.

7-58. Public Concern: The Forest Service should describe the desired future conditions for old growth on the forest.

Response: Many of the comments on this topic relate to questions about following the regional guidance for old growth. There are a number of ways to meet the regional old growth guidance for having a "network" of large, medium and small old growth patches. These "patches" do not need to be specifically allocated to a Management Prescription 6. Old growth management can be met in other management prescriptions as well. When all the compatible prescriptions were mapped out, along with the forest-wide standard to protect any stand that meets the criteria for "existing old growth" (which can include either stands currently inventoried or stands identified sometime in the future), a determination was made as to whether or not this "old growth network" was adequate, or if other specific old growth allocations were needed to fill in any "gaps" in the "network". In most cases, it was determined that the combination of the allocations of all the old growth compatible management prescriptions, along with the forest-wide standard on "existing old growth", that the resultant "old growth network" was sufficient to address the old growth issue.

7-59. Public Concern: The Forest Service should explain why Management Prescription 6X is not better utilized on the Southern Appalachian National Forests.

Response: Many of the comments on this topic relate to questions about following the regional guidance for old growth. There are a number of ways to meet the regional old growth guidance for having a "network" of large, medium and small old growth patches. These "patches" do not need to be specifically allocated to a Management Prescription 6. Old growth management can be met in other management prescriptions as well. When all the compatible prescriptions were mapped out, along with the forest-wide standard to protect any stand that meets the criteria for "existing old growth" (which can include either stands currently inventoried or stands identified sometime in the future), a determination was made as to whether or not this "old growth network" was adequate, or if other specific old growth allocations were needed to fill in any "gaps" in the "network". In most cases, it was determined that the combination of the allocations of all the old growth compatible management prescriptions, along with the forest-wide standard on "existing old growth", that the resultant "old growth network" was sufficient to address the old growth issue.

7-60. Public Concern: The Forest Service should provide for the identification and evaluation of additional old growth patches on National Forest System lands.

Response: See the response to PC 7-61.

7-61. Public Concern: The Forest Service should better explain the old growth network on the Southern Appalachian forests.

Response: There are a number of ways to meet the regional old growth guidance for having a "network" of large, medium and small old growth patches. These "patches" do not need to be specifically allocated to a Management Prescription 6. Old growth management can be met in other management prescriptions as well. When all the compatible prescriptions were mapped out, along with the forest-wide standard to protect any stand that meets the criteria for "existing old growth" (which can include either stands currently inventoried or stands identified sometime in the future), a determination was made as to whether or not this "old growth network" was adequate, or if other specific old growth allocations were needed to fill in any "gaps" in the "network". In most cases, it was determined that the combination of the allocations of all the old growth compatible management prescriptions, along with the forest-wide standard on "existing old growth", that the resultant "old growth network" was sufficient to address the old growth issue.

7-62. Public Concern: The Forest Service should not expand old growth area designations.

Response: Developing a management plan for a national forest involves having to address a multitude of trade-offs. For the Southern Appalachian National Forests this includes trying to address 12 common issues, which are not necessarily compatible. An *effort is made to find the mix of management activities that will best address all the issues. This means having a mix of areas where active management activities will be used to meet such issues as early-successional wildlife habitat needs, providing forest products, addressing forest health, etc. while other areas will be managed to provide late-successional wildlife habitat needs, and to meet social demands for things such as old growth areas, areas for backcountry recreation, scenic areas, wilderness areas, etc. However, in many of these areas in the later category, certain activities to meet forest health needs may still be allowed to occur.*

7-63. Public Concern: The Forest Service should provide a connection between existing old growth, possible old growth, and future old growth.

Response: "Possible Old Growth" is simply an initial inventory, to give planners an indication of where "existing old growth" stands might be found; and to give planners some information on where it would make sense to allocate management prescriptions for the purposes of managing/maintaining old growth. This initial inventory is essentially nothing more than a query of the CISC database to find stands older than a certain age.

"Existing Old Growth", however, are those stands that meet all the criteria for being classified as "existing old growth" as determined by the Regional "Guidance for Conserving and Restoring Old Growth Forest Communities". This regional guidance identifies up to eight criteria for making that determination. Whether or not a stand will meet these criteria is usually only determined by a field inventory.

"Future Old Growth" includes acres in management prescription allocations where stands will likely meet the definition for "old growth" at some point in the future. "Existing old growth" stands may be found in old growth compatible management prescriptions ("future old growth") and relatively isolated stands of "existing old growth" may also be found in other management prescription allocations.

The "old growth network" is provided for through a combination of the lands allocated to the old growth compatible management prescriptions, and a forest-wide standard that protects the "existing old growth" found in the other management prescriptions.

7-64. Public Concern: The Forest Service should better address the overall old growth strategy.

Response: Many of the comments on this topic relate to questions about following the regional guidance for old growth. There are a number of ways to meet the regional old growth guidance for having a "network" of large, medium and small old growth patches. These "patches" do not need to be specifically allocated to a Management Prescription 6. Old growth management can be met in other management prescriptions as well. When all the compatible prescriptions were mapped out, along with the forest-

wide standard to protect any stand that meets the criteria for "existing old growth" (which can include either stands currently inventoried or stands identified sometime in the future), a determination was made as to whether or not this "old growth network" was adequate, or if other specific old growth allocations were needed to fill in any "gaps" in the "network". In most cases, it was determined that the combination of the allocations of all the old growth compatible management prescriptions, along with the forest-wide standard on "existing old growth", that the resultant "old growth network" was sufficient to address the old growth issue.

7-65. Public Concern: The Forest Service should recognize that the information and analysis of old growth is insufficient.

Response: Many of the comments on this topic relate to questions about following the regional guidance for old growth. There are a number of ways to meet the regional old growth guidance for having a "network" of large, medium and small old growth patches. These "patches" do not need to be specifically allocated to a Management Prescription 6. Old growth management can be met in other management prescriptions as well. When all the compatible prescriptions were mapped out, along with the forest-wide standard to protect any stand that meets the criteria for "existing old growth" (which can include either stands currently inventoried or stands identified sometime in the future), a determination was made as to whether or not this "old growth network" was adequate, or if other specific old growth allocations were needed to fill in any "gaps" in the "network". In most cases, it was determined that the combination of the allocations of all the old growth compatible management prescriptions, along with the forest-wide standard on "existing old growth", that the resultant "old growth network" was sufficient to address the old growth issue.

7-66. Public Concern: The Forest Service should delineate large and medium patches of old growth on National Forest System lands.

Response: Since old growth inventories are generally at the stand level, they are not allocated to specific management prescriptions in the revised Plan. Instead, it is recognized that these stands could occur in any management prescription allocation, and in order to protect those stands of existing old growth, a forest-wide standard is included in the revised Plan to provide that protection. This standard applies to both those stands currently identified as existing old growth, as well as any stands that may be identified in the future as meeting the criteria for "existing old growth". Project level evaluation will have to see if any of the stands proposed for management activities meet the old growth definition, stand identified in this process will be delineated and protected. Unsuitable areas that provide potential old growth are identified by management prescription and can be viewed on the revised Plan maps.

7-67. Public Concern: The Forest Service should specify adequate old growth goals, objectives, and management prescriptions for the Southern Appalachian forests.

Response: Many of the comments on this topic relate to questions about following the regional guidance for old growth. There are a number of ways to meet the regional old growth guidance for having a "network" of large, medium and small old growth patches. These "patches" do not need to be specifically allocated to a Management Prescription 6. Old growth management can be met in other management prescriptions as well. When all the compatible prescriptions were mapped out, along with the forest-wide standard to protect any stand that meets the criteria for "existing old growth" (which can include either stands currently inventoried or stands identified sometime in the future), a determination was made as to whether or not this "old growth network" was adequate, or if other specific old growth allocations were needed to fill in any "gaps" in the "network". In most cases, it was determined that the combination of the allocations of all the old growth compatible management prescriptions, along with the forest-wide standard on "existing old growth", that the resultant "old growth network" was sufficient to address the old growth issue.

Early Successional

7-68. Public Concern: The Forest Service should acknowledge that increasing early successional habitat simply justifies timber harvest and perpetuates an unnatural forest.

Response: Early successional habitat is composed of early successional forest (0-10 year old), permanent wildlife openings, maintained rights-of-way, and restored woodland or savanna habitats. Different types of early successional habitat satisfy the requirements of various wildlife species and allow the restoration and expansion of several rare communities (such as canebrakes, wet meadows, bogs, etc.) Tree removal or tree density reduction along with prescribed fire simulates natural disturbance patterns that have been interrupted by surrounding land use conversion and past management regimes. These management actions allow the restoration of a "natural" forest, in contrast to the assertion of the Public Concern statement.

7-69. Public Concern: The Forest Service should account for naturally occurring canopy openings in the analysis of early successional habitat, and implement management based on natural processes.

Response: Some commenters expressed dissatisfaction with our approach of not counting early-successional forest patches of less than two acres towards early-successional forest objectives. This approach was adopted for two primary reasons. First, some species, such as prairie warblers and golden-winged warblers, are restricted to, or prefer, larger habitat patches. Meeting early-successional forest objectives *through provision of many small patches would not meet their habitat requirements. Second, there is a limit to the size of patches that can be efficiently tracked in inventories and analyzed for habitat availability. Two acres was the smallest unit deemed practical to try to map and track in inventories, and is considerably smaller than current inventories typically track. It is also typically the largest size of opening created during group selection treatments; larger openings are generally considered even-aged or two-aged patches. We recognize that openings and canopy gaps less than two acres, whether created by management or of natural origin, provide a habitat condition with some early-successional characteristics that are important to some species. To provide for all species, however, it is necessary to provide the full spectrum of successional forest habitats.*

7-70. Public Concern: The Forest Service should provide sufficient early successional habitat.

TO BENEFIT WILDLIFE

Response: Early-successional habitat was one of the topics most frequently raised by commenters. However, some commenters did not appear to recognize distinctions among types of early-successional habitat that we have made in the Revised Plan and EIS. Understanding these distinctions is important because early-successional habitats are not all the same in their value to wildlife and in strategies for their management. Types of early-successional habitat that we have addressed include early-successional forests, open woodlands, permanent wildlife openings, and maintained rights-of-way.

Percentage objectives within prescriptions, which were the focus of many comments, are for early-successional forest only. Other types of early-successional habitat within the block are treated as non-forest and, therefore, are not included in percentage calculations. Presence of these other types is meant to supplement early-successional forest objectives in determining overall abundance of early-successional habitats.

Comments calling for both higher and lower objectives for early-successional forest were common. Commenters in favor of higher objectives included state wildlife management agencies, wildlife professional organizations, hunting and game species conservation organizations, and bird conservationists. In some cases, these commenters suggested specific objective levels, generally ranging from 5 to 15 percent forest-wide. Commenters in favor of lower objectives included environmental organizations and those interested in low intensity management strategies and undisturbed mature forest conditions. These commenters frequently pointed to openings created by natural disturbances and canopy gaps from natural treefall, along with private lands, as habitat sources that reduce the need for creation of early-successional forest on national forest lands.

In a recent review paper by disturbance ecologist Craig Lorimer (Historical and ecological roles of disturbance in eastern North American forests: 9,000 years of *change. Wildlife Society Bulletin 2001, 29(2):425-439), Lorimer concludes: "Deciding on the optimal amount of early successional habitat on public lands is a complex ecological and social issue that can be guided only in part by scientific evidence." The diversity of perspectives expressed in comments reflects the complexity of this as a social issue. To provide for this diversity of views, as well as a for a diversity of habitats, we defined four mixes or "options" of successional forest conditions to be assigned to specific portions of the national forest landscape (see definitions of options in the Successional Forests section of the EIS). These options were allocated to the landscape through prescription assignments after considering a variety of factors, including successional habitat abundance and distribution across the forest, settings for other multiple uses, and legal and logistical constraints on management opportunity. We have allocated successional forest options in the Revised Plan in a mix that we feel provides the best balance in meeting the wide range of public desires evident in the comments.*

Option 1, which has no early-successional forest objective, was defined to recognize there are many portions of the national forest where creation of early-successional forest through management is not legal, feasible, or desirable. Such areas include Wilderness, areas of rugged terrain, and areas sensitive because of other resource uses and values. Forests in these areas will predominately move toward old growth conditions and provide optimal habitat for late-successional forest species. The selected alternative allocates 18% of National Forests in Alabama to this option.

Option 2, which also has no early-successional forest objective, but which may include up to 4 percent in early-successional forest, was defined to recognize there are portions of the forest where early-successional forest is not a priority, but may be desirable at low levels to increase habitat diversity and meet other multiple-use needs. Such areas may include recreational, aesthetic, or late-successional forest wildlife emphasis areas. As with Option 1, these areas will be dominated by late-successional and old growth forests. The selected alternative allocates 0% of the National Forests in Alabama to this option.

Option 3 has an early-successional forest objective of 4 to 10 percent of forested acreage. It was defined to provide an intermediate mix of successional forest habitats, as well as to allow diversification of forest age classes for forest health, conversion of forest types for ecological restoration, and provision for other related multiple uses. If implemented in a fully regulated way, this objective would result in forests growing to 100 to 250 years before being regenerated (however, in reality some may be regenerated earlier and some may be maintained as old growth). This mix still provides for a general increase of older forests relative to current conditions. Both early- and late-successional forest species would find habitat in these areas. For National Forests in Alabama, the recreation emphasis prescriptions (7.E.2) make up the largest proportion of prescription acres in this option. The selected alternative allocates 82% of the National Forests in Alabama to Option 3 and Option 4.

Option 4 has an early-successional forest objective of 10 to 17 percent of forested acreage. It was defined to provide areas that are optimal for early-successional forest dependent wildlife based on recommendations in the scientific literature. It also will allow accelerated diversification of forest age classes and restoration of desired forest types. If implemented in a fully regulated way, this objective would result in forests growing to 60 to 100 years before being regenerated (however, in reality some may be regenerated earlier and some may be maintained as old growth). For National Forests in Alabama, the native ecosystem restoration emphasis prescriptions (9.C.3, 9D, 9.D.1, and 9G) make up the largest proportion of prescription acres in this option. However, although this prescription allows early-successional forest percentages of up to 17%, other management objectives, such as Red-cockaded woodpecker habitat guidelines, limit regeneration in pine forest types to 8.3%. The selected alternative allocates 82% of the National Forests in Alabama to Option 3 and Option 4.

Please see the discussion of Successional Forests in the Terrestrial Habitats section of the EIS.

7-71. Public Concern: The Forest Service should specify that 4-10 percent of acreage will be maintained as early successional forest.

TO BENEFIT WILDLIFE

Response: See response to PC 7-68.

7-72. Public Concern: The Forest Service should specify that 10-15 percent of acreage will be maintained as early successional forest.

TO SUSTAIN VIABLE POPULATIONS

TO PROVIDE TIMBER AND OTHER MULTIPLE USE VALUES

Response: See response to PC 7-68.

7-73. Public Concern: The Forest Service should modify language in desired conditions by restricting the range of habitat percentages.

TO MINIMIZE DISCRETION THAT FAVORS MINIMUM HABITAT LEVELS

Response: See response to PC 7-68.

7-74. Public Concern: The Forest Service should not create 4-5 percent of early successional habitat within forests.

BECAUSE UNNATURAL CONDITIONS WILL REQUIRE CONTINUOUS MANAGEMENT

Response: See response to PC 7-68.

7-75. Public Concern: The Forest Service should specify how the amounts of early successional habitat were determined and the reasoning used.

Response: See response to PC 7-68.

7-76. Public Concern: The Forest Service should restrict tree harvesting to areas of 40 acres or less.

TO AVOID CREATING EXTENSIVE EVEN-AGED FORESTS IN THE FUTURE

Response: Agency guidelines restrict hardwood regeneration area to 40 acres in size. Agency guidelines also restrict southern yellow pine regeneration area to 80 acres in size. However, several situations such as insect and disease outbreaks, management of industrial tree plantations acquired by the Forest Service after establishment, and intermediate (not regeneration) treatments of areas larger than 80 acres may be the best course of action under certain circumstances. Red-cockaded woodpecker standards limit regeneration of on-site pine to 25 acres, whereas off-site pines may be regenerated in areas of up to 80 acres. Project-level decisions will consider unique circumstances and determine the best course of action.

7-77. Public Concern: The Forest Service should increase early succession goals in less restrictive prescriptions.

*Response: Please see the response to Public Concern statement 7-68.
National Forests in Alabama only sparingly applied the most unrestricted prescriptions (10's). The restoration prescriptions (9.C.3, 9.D, 9.D.1, and 9.C.3) are the least restrictive prescriptions, with regard to the amount of early-successional forest allowable. This was done to accommodate native ecosystem restoration to the greatest extent possible, while minimizing public concern. Large amounts of early successional forest have proven in past decisions to be a public concern. The Option of 10%-17% has been defined to provide areas that are optimal for early-successional forest dependent wildlife based on recommendations in the scientific literature. It also allows accelerated diversification of forest age classes and restoration of desired forest types.*

7-78. Public Concern: The Forest Service should not create early successional habitat in riparian areas.

Response: There are natural resources, such as rare communities and wildlife species, that are dependent or highly associated with riparian habitats, that are benefited by disturbance (which harvest treatments simulate) which result in early successional habitats in riparian areas. These would include: canebrakes, wet meadows, Swainson's warbler, American woodcock, and common snipe. Project-level analyses are necessary to determine needs for early successional habitat creation.

Suitability Determinations

7-79. Public Concern: The Forest Service should complete an analysis of relative resource values in allocating lands suitable for timber production.

36 CFR 219.12(g)(1) instructs Forest Plan development by requiring an analysis of expected outputs during the planning period. It suggests use of outputs that include marketable goods and services as well as non-market items, such as recreation and wilderness use, wildlife and fish, protection and enhancement of soil, water, and air, and preservation of aesthetic and cultural resource values. These are the resources the forest DEIS has undertaken to show a present net value as required by 36 CFR 219.

The National Forests in Alabama have presented a present net value of resources which are suggested in 36 CFR 219.12(g)(1). The Forests have discussed only foreseen consequences of our land management alternatives on the environment in a narrative fashion. For those resources that can be reasonably valued via market data (e.g. timber, minerals, range) and for those non-market resources that have Forest Service estimated values from Forest Service Research, we have presented values in the present net value calculation. For resources that have no values estimated by generally accepted methods, we have chosen to discuss them in a narrative fashion as part of the assessment of net public benefits.

Many of the "ecosystem services" provided by forested land, such as flood control, purification of water, recycling of nutrients and wastes, production of soils, carbon sequestering, pollination, and natural control of pests; and externalized costs of resource extraction, such as increased rates of death, injury and property damage resulting from accidents involving heavy equipment, log trucks, ORVs and other dangers related to intensive resource use and development, are considered to be effects remote from resource management on the National Forests in Alabama. Their speculative and unforeseen nature does not warrant a consideration in the efficiency analysis required by 36 CFR 219.

Contrary to what the commenter claims, logging does not necessarily cause most ecosystem services to be significantly diminished or entirely eliminated. Logging is only conducted on a portion of all national forest lands, and the interval between repeat entries onto the same area is often measured in decades. When logging is undertaken, it is conducted in accordance with revised Plan standards and guidelines designed to protect other resource values. Logged areas are regenerated to a new forest, so any disruption of services is only temporary. Finally, it is important to recognize that some ecosystem services – e.g., wildlife habitat – may actually benefit from logging. This last point is indicative of a larger problem. The commenter focuses exclusively on the potential negative effects of logging; they ignore the fact that national forest logging can have external benefits as well as costs.

Lastly, the Forest Service does not use its socio-economic analysis quantified measures and indexes as the sole means of displaying alternative inputs (FSM 1970.8(5)). Such a value is one piece of information for the decision maker to use in selecting among alternatives. Other resources that are impacted are discussed qualitatively. Their consequences in forest management are decided along with the monetized resource in arriving at an alternative that maximizes net public benefits. After reviewing the planning documentation and comments from the public participation, the determination of the best alternative that maximizes public net benefits is left to the judgment of the decision maker.

U.S. Forest Service activities on the Forest are governed by a large number of rules and regulations designed to mitigate negative impacts or otherwise protect forest resources. In the planning process, these benefits associated with regulations are seldom quantified in dollar terms. The costs for achieving these benefits are in the form of increased operating costs and reduced timber revenues.

Therefore, it is the U.S. Forest Service's policy to fully enumerate the dollar values of all market and non-market benefits and costs in the planning process that can reasonably *be expected to occur in an attempt to provide as much relevant information as possible to aid in making good planning decisions.*

Adequacy of Analysis

7-80. Public Concern: The Forest Service should not base management decisions on a successional forest model.

BECAUSE IT FAILS TO ACCURATELY MODEL THE DYNAMICS OF SOUTHERN APPALACHIAN FORESTS

Response: See response to PC 7-52.

7-81. Public Concern: The Forest Service should not use Continuous Inventory of Stand Conditions data to determine the current composition of the National Forest System lands.

Response: The Forest Service's goal has been to use the best available data in the preparation of the Southern Appalachian Plan revisions. The best available data for vegetation included the CISC data for each Forest involved. CISC data has always been mandated to be kept current and accurate by field exams over time. We feel the CISC record is valid for the purposes used in the revision analysis.

7-82. Public Concern: The Forest Service analyses in Appendix F should better reflect natural processes, operability standards, and budget constraints.

Response: This comment refers to using methods other than timber harvesting to accomplish plan goals and emphasizing the use of group selection. The selected alternative contains goals and objectives that will be accomplished by the manipulation of vegetation including timber harvesting and prescribed burning. Chapter 3 of the FEIS and Appendix E of the FEIS discusses silvicultural methods and their appropriate use. Chapter 3D of the FEIS discusses the economics of implementing the various alternatives.

Environmental Considerations

7-83. Public Concern: The Forest Service should conduct timber harvest for environmental reasons.

BECAUSE IT IS THE MOST EFFECTIVE AND ECONOMICAL MEANS TO MAINTAIN FOREST HEALTH AND WILDLIFE POPULATIONS

Response: The selected alternative contains goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). These Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC.

7-84. Public Concern: The Forest Service should harvest timber in a manner that does not negatively affect watershed health.

Response: The Forest Service has added additional mitigation measures and directives for ephemeral streams and the management of slopes along the riparian corridor since the draft Plan was published. These additional mitigation measures and directives developed in coordination with USFWS will serve in attaining watershed health from both a water quality perspective and an aquatic species perspective.

7-85. Public Concern: The Forest Service should not permit timber harvesting within a quarter mile of the cliff lines above canyon corridors.

Response: During site-specific project planning and implementation, resource specialists will be utilized to determine adequate protection for cliffs and associated communities. While ¼ mile may be adequate in some cases, it may not be in others, and specialists can best make this determination on the ground on a case-by-case basis.

7-86. Public Concern: The Forest Service should not conduct timber harvest in bat management areas.

BECAUSE TIMBER HARVEST MAY DISRUPT BAT ROOSTING AND REPRODUCTION

Response: The Forest Service works with the US Fish and Wildlife Service to determine protections for bats and associate habitat. The standards in the TES section of the Plan chapter 2 detail some of those protections.

7-87. Public Concern: The Forest Service should not conduct timber harvest in bat management areas.

BECAUSE TIMBER HARVEST MAY DISRUPT BAT ROOSTING AND REPRODUCTION

Response: See response to PC 7-84.

7-88. Public Concern: The Forest Service should consider that Habitat Conservation Plans and Safe Harbors may rely upon National Forest System lands.

AND TIMBER HARVEST ON THOSE LANDS COULD PUT THE PLANS IN JEOPARDY

Response: Congress intended the HCP (of which Safe Harbor is a part) process to be used to reduce conflicts between federally listed species and non-federal development and land use, and to provide a framework for "creative partnerships" between the public and private sectors in endangered species conservation. HCPs pertain to federally listed species occurrences on private lands. Endangered species occurrences on public lands are governed by the Endangered Species Act, NEPA, and NFMA. Managed National Forests are considered islands of secured habitat. As such, they often form the core areas for Safe Harbor and HCP Plans on private lands. Timber management is an accepted tool to restore and manage habitats needed by endangered species on both public and private lands. Timber management as prescribed in the selected alternative would allow for endangered species habitat restoration and maintenance and would allow the National Forests in Alabama to supply mature and old forests at the landscape scale. Please see the Successional Forests and Migratory Birds sections of Chapter 3B of the EIS for a discussion of this topic.

7-89. Public Concern: The Forest Service should not harvest timber.

BECAUSE TIMBER HARVEST DAMAGES THE SIPSEY RIVER WATERSHED

Response: The selected alternative for the Southern Appalachian Plans does contain goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). These Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC. Chapter 2 and 3 of the Plan contain standards that protect the Sipsey River watershed and others as well.

7-90. Public Concern: The Forest Service should not conduct commercial timber harvest because of environmental impacts.

Response: The selected alternative contains goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). These Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC.

Recreation Considerations

7-91. Public Concern: The Forest Service should not harvest timber.

BECAUSE RECREATION GENERATES GREATER INCOME THAN TIMBER-BASED ECONOMIES

Response: The selected alternative contains goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). These Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC.

Cultural and Archaeological Resource Considerations

7-92. Public Concern: The Forest Service should protect significant archaeological sites from the effects of timber harvest.

Response: The Forest Service will protect National Register eligible historic sites from the effects of timber harvest. There are cases when vegetation modification will enhance the characteristics of the site, such as in the case of restoration of native species, or perhaps thinning a stand near a fire tower. The frequency of these cases would be low. Logging activities would only take place within National Register Districts when the logging enhances the district. Buffer zones would be established around the individual sites. All of these activities would include consultation with the Alabama SHPO. Buffer zones placed above bluff lines are 100 feet back from any bluff line over 25 feet high. In cases where potentially eligible bluff shelters are present, a 100-foot buffer zone will be placed above the site (See Forest-wide Standards).

7-93. Public Concern: The Forest Service should not permit timber harvesting within a minimum of 500 feet of top of rock shelters worthy of consideration as a National Register of Historic Places.

Response: See comment PC 7-92 regarding bluff lines.

Socioeconomic Considerations

7-94. Public Concern: The Forest Service should harvest timber for economic benefits.

TO RURAL COMMUNITIES

Response: Indeed, the selected alternative for the Southern Appalachian Plans does contain goals and objectives that will be accomplished by the activity of timber harvesting.

7-95. Public Concern: The Forest Service should conduct commercial timber harvest for economic benefits.

TO LOCAL ECONOMIES

Response: Indeed, the selected alternative for the Southern Appalachian Plans does contain goals and objectives that will be accomplished by the activity of timber harvesting.

7-96. Public Concern: The Forest Service should not harvest timber for economic reasons.

BECAUSE TIMBER HARVEST WILL NEGATIVELY AFFECT TOURISM-BASED BUSINESSES

BECAUSE IT CREATES NEGATIVE EFFECTS ON PRIVATE TIMBER PRODUCTION

Response: The selected alternative for the Southern Appalachian Plans does contain goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). These Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC. A minimum management (custodial) alternative was developed, but was not studied in detail due to its failure to meet the mandates of NFMA and the MUSYA.

7-97. Public Concern: The Forest Service should not allow commercial timber harvest for economic benefits.

Response: The selected alternative for the Southern Appalachian Plans does contain goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). These Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of *goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC. A minimum management (custodial) alternative was developed, but was not studied in detail due to its failure to meet the mandates of NFMA and the MUSYA.*

7-98. Public Concern: The Forest Service should evaluate the impacts of national forest timber on local markets and pricing.

Response: Local timber market conditions are analyzed in the Forest's Timber Supply and Demand Analysis that is done during the Analysis of the Management Situation (AMS). This document is part of the Process Record and gives the Forest a background for their role in the local market and possible effects on pricing. Such characteristics as growing stock, the Forest's relative share of the total market area of all ownerships, growth-drain ratios to understand if growth exceeds harvest, and Forest Service dependent mills are some of the things this analysis discusses. The Forest has been requested to furnish a summary of their timber analysis in Appendix B for the FEIS.

7-99. Public Concern: The Forest Service should cease timber production and increase other products.

Response: The selected alternative for the Southern Appalachian Plans does contain goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). The majority of these goals and objectives, however, are not themed to timber production. Rather, the theme is ecosystem restoration and maintenance and forest health. Lastly, this Plan makes strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC. A minimum management (custodial) alternative was developed, but was not studied in detail due to its failure to meet the mandates of NFMA and the MUSYA.

7-100. Public Concern: The Forest Service should help loggers shift to harvests on private lands.

USING SUSTAINABLE, UNEVEN AGED MANAGEMENT

Response: While this view is appreciated, it is not something within the purview of the Forest Land and Resource Management Plan.

7-101. Public Concern: The Forest Service should utilize the best available science in determining to what extent monetary values can be assigned to non-market goods and services.

Response: The National Forests in Alabama used both market and non-market prices in its economic efficiency analysis. This Forest used values for resource programs suggested in 36 CFR 219.12(g)(1). These values are presented in tables of EIS Appendix B. These tables have been revised for the FEIS to better reflect the sources of the valuations.

These priced market and non-market values along with program costs are used in a present net value analysis, but this economic analysis of quantified measures is not used as the sole means of displaying alternative outputs (FSM 1970.8(5)). Such a present value analysis is one piece of information for the decision maker to use in selecting among alternatives. Other non-priced resources may be discussed qualitatively. Both the priced and non-priced resources in forest management are considered in arriving at an alternative that maximizes net public benefits. After reviewing the planning documentation and comments from the public participation, the determination of the best alternative that maximizes net public benefits is left to the judgment of the decision maker.

7-102. Public Concern: The Forest Service should disclose the instructions and rationale for the data collection direction given to address timber production and management costs.

Response: Forest Service estimates of revenues and expenses are achieved by analyzing historical data. These estimates are for activities that have not happened. We looked at timber harvesting and timber sale planning costs from sales that occurred in the 1990's. The methodology explaining how we derived timber costs and revenues is explained in the Process Record. Most modeling and data estimation techniques are not explained in detail in the EIS.

The Southern Appalachian forests used historical data secured from TSPIRS for 1992-1998. Region 8 forests looked at data concerning Harvest Administration costs (and various subsets of this cost category), Sale Preparation costs, and Inventory and NEPA costs (and various subsets of this cost category). From this data, an average was taken for each year. Then, we took a simple average by year for each forest to arrive at an average cost in each timber sale cost category. This data was used in SPECTRUM.

Each individual forest calculated Reforestation and Timber Stand Improvement costs (and their related subsets of costs, e.g. types of site preparation under Reforestation; species of trees under Reforestation planting; types of Release, Pre-commercial Thin, Road construction under Timber Stand Improvement) from available forest data. Costs were taken from each forest and placed in a category of forest of either Piedmont or Mountain forest. Costs were adjusted to a common year (1996) and a simple average for each region was taken. These costs were also used in the SPECTRUM model after adjusting to 2000 dollars.

The Timber Data Company in Eugene, Oregon collects timber sale data stumpage prices from FS 2400-17 reports, puts this data in a database, and is able to report data out in customized fashions. We purchased this data from hundreds of sales over several years in the 1990 decade. A time series of these years of historical stumpage was analyzed for an estimate of an "average" value for forest stumpage via a regression analysis spreadsheet in Microsoft Excel. This average price was adjusted to 2000 dollars and used in the SPECTRUM model.

Purchaser road credits are no longer used by Region 8 forests. The category of "interest and penalties" is a cost, which is a rare and insignificant amount to the total. These costs are considered exceptions to the typical costs experienced in the timber program. Such future costs are not considered a significant cost category.

Estimated costs and revenues within SPECTRUM can be increased by an inflation factor for future years by the forest analyst.

7-103. Public Concern: The Forest Service should award timber sales only if they are cost effective for the government.

Response: If economics is at issue in any given proposed action, NEPA requires economics to be a part of the analysis disclosure so the decision maker can make a completely informed decision. Certainly, economics was part of the analysis disclosure for the Southern Appalachian Plans in the Final EIS for each Forest.

7-104. Public Concern: The Forest Service should not use tax dollars to subsidize timber harvesting.

Response: USDA Forest Service activities on the forest are governed by a large number of rules and regulations designed to mitigate negative impacts or otherwise protect forest resources. While development of roads is a forest expense, roads create access for other forest users and does not benefit solely timber harvesting. Contrary to what the commenter claims, logging does not necessarily cause most habitat to be damaged. When logging is undertaken, it is conducted in accordance with revised Plan standards and guidelines designed to protect other resource values.

At the programmatic level, estimated costs and benefits for the timber program are analyzed in a present net value fashion. Results of the preferred alternative can be viewed in Chapter 3 of the EIS under "Present Net Value of Alternatives" chapter 3D. Individual timber sales are analyzed before a project is undertaken. Discounted costs and benefits are considered to see if the project will be economically efficient. Sale analyses include costs for roads. If a proposed sale alternative does show a negative return, the decision maker will justify the reason for commencing with the project. Because there are often positive effects on other resource values such as habitat and access for recreation opportunities, there is no mandate for projects to be profitable.

Timber sale projects are put out for competitive bid of what the market will bear for a given quality of timber. Bidders must bid above a "floor" appraised price before a contract will be awarded. Therefore, construction of roads and timber sales on national forests do not necessarily amount to "corporate welfare".

7-105. Public Concern: The Forest Service should conduct NEPA analysis on a range of alternative to providing subsidies to industry.

Response: The premise of the commenter's statement is flawed. There is an assumption of the future timber program on this forest incorporates a subsidy across all alternatives. The Present Net Value analysis found in Chapter 3D of the DEIS estimates that across all alternatives the Timber program is expected to meet its hurdle rate of 4 percent real *return to the federal treasury. Clearly, discounted revenues are expected to cover discounted costs over the planning period. When individual projects are planned, a discounted cash flow analysis of that proposed sale is also conducted in an Environmental Analysis to show the efficiency of that sale*

Allowable Sale Quantity

7-106. Public Concern: The Forest Service should increase the annual timber harvest volume.

FOR RESPONSIBLE STEWARDSHIP OF PUBLIC RESOURCES AND INVESTMENT

BECAUSE OF EFFECTS ON FOREST PRODUCTS INDUSTRIES IN NATIONAL AND INTERNATIONAL MARKETS

TO ACCOMPLISH RESTORATION OBJECTIVES

TO FACILITATE SITE RESTORATION AND FOREST HEALTH

BECAUSE OF ECONOMIC EFFECTS

Response: The planning process for the Southern Appalachians included analysis of a range of alternative management themes. Within these alternatives was a range of levels of timber harvest volumes. The selected alternative does not have the highest level of timber harvest, but addresses the spectrum of significant issues best in its combination of resource activities and emphases.

7-107. Public Concern: The Forest Service should specify that annual timber harvest will not fall below 8.5 million cubic feet.

TO ENSURE SUITABLE HABITAT DIVERSITY

Response: As defined in Chapter 3 of the DEIS, the ASQ indicates the estimated timber yield from suitable lands of a particular management strategy, for a ten-year period.

Annual yields may vary depending on a number of factors including site-specific analyses for individual projects.

7-108. Public Concern: The Forest Service should lower the allowable sale quantity of timber.

TO LEVELS BELOW THE QUANTITY CURRENTLY BEING HARVESTED

Response: The planning process for the Southern Appalachians included analysis of a range of alternative management themes. Within these alternatives was a range of levels of timber harvest volumes. The selected alternative does not have the highest level of timber harvest, but addresses the spectrum of significant issues best in its combination of resource activities and emphases.

7-109. Public Concern: The Forest Service should reduce the amount of forest designated as "suitable" for timber production.

BECAUSE OF THE ENVIRONMENTAL EFFECTS

Response: The planning process for the Southern Appalachians included analysis of a range of alternative management themes. Within these alternatives was a range of levels of timber harvest volumes, and acres of 'suitable for timber production'. The selected alternative does not have the highest level of timber harvest, or suitable acres, but addresses the spectrum of significant issues best in its combination of resource activities and emphases.

7-110. Public Concern: The Forest Service should clarify if the agency must cut more trees over a greater area to satisfy timber demand.

Response: The revised Plan includes timber harvest to achieve ecosystem restoration, forest health, wildlife and other resources goals and objectives. The number of trees cut, and the number of acres harvested will depend on the goals and objectives being met.

7-111. Public Concern: The Forest Service should eliminate the use of allowable sale quantity as a measurement.

Response: Allowable Sale Quantity (ASQ) is a planning requirement (to set a limit on the quantity of timber that may be sold during the period of time covered by the Plan) of the 1982 version of the NFMA Regulations. The proposed planning regulations dated December 2002 does eliminate the ASQ requirement, and uses, instead, long-term sustained yield as the upper limit of timber that may be harvested from suitable land (on a sustained yield basis), consistent with achievement of objectives or desired conditions in the applicable Plan.

Harvest Methods

7-112. Public Concern: The Forest Service should limit timber harvest to small diameter trees.

Response: For the Southern Appalachian Plans, timber harvesting will be used as a tool to achieve goals and objectives that will mainly be ecosystem restoration and maintenance related, or forest health related. The type of harvest and diameter of trees to harvest will be dependent on the goal or objective for any given acre of National Forest land.

7-113. Public Concern: The Forest Service should specify standards requiring that timber harvest be conducted using scientifically sound methods, and that on-site monitoring be conducted by Forest Service staff.

Response: Forest-wide Standards for timber harvest and other resource management activities are in Chapter 2 of the Plan. Additional standards may be found in Chapter 3 along with the management prescription descriptions.

Even-aged Timber Management

7-114. Public Concern: The Forest Service should limit the use of clearcutting to areas where restoration is needed.

Response: The selected alternative contains goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). The Plan makes strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC.

7-115. Public Concern: The Forest Service should only clearcut National Forest System lands that have been planted for the pulp industry.

Response: While no areas have been specifically planted for the pulp industry, we recognize your concern with clearcutting on areas with plantations only. The selected alternative contains goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct).

7-116. Public Concern: The Forest Service should not clearcut National Forest System lands.

Response: Response: The selected alternative contains goals and objectives that will be accomplished by the activity of timber harvesting (including clearcutting, where silviculturally correct). These Plans make strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC.

Fire Management

7-117. Public Concern: The Forest Service should conduct fire suppression in an efficient and cost effective manner.

Response: Thank you for the comment.

7-118. Public Concern: The Forest Service should address the effects of fire on riparian areas.

Response: This is typically done at a site-specific or project level basis.

7-119. Public Concern: The Forest Service should address the effects of fire on clay-rich soils.

Response: This is done by soil type on a site-specific or project level basis.

7-120. Public Concern: The Forest Service should include an additional goal to require that prescribed fires and wildfire controls should be conducted to minimize pollution of surface waters.

AND SHOULD INCLUDE STANDARDS OR OBJECTIVES TO ACCOMPLISH THE GOAL

Response: The forest has developed standards to insure that prescribed fires are conducted to minimize pollution of surface waters. Forest-wide standards and the Riparian Prescription specifically include protection measures related to prescribed fires. The forest also complies with the vegetation management EIS for the Southern Appalachians. Wildfire control measures always consider effects to the resources, including surface waters and aquatic habitat. Wildfire burn rehabilitation measures are also developed to restore aquatic habitats where necessary.

Fire Management Standards and Guidelines

7-121. Public Concern: The Forest Service should address the methods and effects of firebreak construction.

Response: This is done on a site-specific or project level basis.

Role of Fire in Ecosystems

7-122. Public Concern: The Forest Service should address the conflict between the proposed prescribed burn program and the natural role of fire in the Southern Appalachians.

Fire played an important role in shaping the species rich landscape of the southeastern U.S. Fires of both natural and cultural origin were common on the landscape when the present arborescent flora migrated into the region after the last ice age, 8,000 to 10,000 years ago (Delcourt and Delcourt, 1996). Fire has been a part of the southern Appalachian landscape for longer than its current vegetation has been (Delcourt and Delcourt, 1996).

Land and Resource Management Plans provide direction for desired future conditions of ecosystems. In many cases, fire is a necessary tool to meet those desired conditions.

Objectives in Forest Service Manual 5140 are to use fire from either management ignitions or natural ignitions in a safe, carefully planned, and cost effective manner to benefit, protect, maintain, and enhance National Forest System resources; to reduce future fire suppression costs; and, to the extent possible, to restore natural ecological processes and achieve management objectives adopted in approved Forest Land and Resource Management Plans.

Fuels Management

7-123. Public Concern: The Forest Service should provide an adequate analysis of the fuels management program.

Response: Although prescribed burning accomplishes fuel reduction, the primary purpose identified in the revised Plan is restoration of forest health and returning to historical fire regimes. The EIS does include an analysis of direct and indirect effects of fire management, as well as cumulative effects (EIS Chapter 3).

Prescribed Fire

7-124. Public Concern: The Forest Service should reintroduce fire as a management tool.

TO RESTORE LONGLEAF AREAS

TO REDUCE FUELS, AND IMPROVE FOREST HEALTH AND WILDLIFE HABITAT

BECAUSE A 'NO-MANAGEMENT' PHILOSOPHY MAY THREATEN NATURAL RESOURCE MANAGEMENT PLANNING

Response: Fire played an important role in shaping the species rich landscape of the southeastern U.S. Fires of both natural and cultural origin were common on the landscape when the present arborescent flora migrated into the region after the last ice age, 8,000 to 10,000 years ago (Delcourt and Delcourt, 1996). Fire has been a part of the southern Appalachian landscape for longer than its current vegetation has been (Delcourt and Delcourt, 1996).

Land and Resource Management Plans provide direction for desired future conditions of ecosystems. In many cases, fire is a necessary tool to meet those desired conditions.

Objectives in Forest Service Manual 5140 are to use fire from either management ignitions or natural ignitions in a safe, carefully planned, and cost effective manner to benefit, protect, maintain, and enhance National Forest System resources; to reduce future fire suppression costs; and, to the extent possible, to restore natural ecological processes and achieve management objectives adopted in approved Forest Land and Resource Management Plans.

7-125. Public Concern: The Forest Service should not use prescribed fire in Southern Appalachian forests.

BECAUSE IT WILL CAUSE IRREPARABLE EFFECTS TO THE FORESTS AND SPECIES

BECAUSE SUCH USE WILL MAKE THE FOREST FLOOR DRIER

Response: see response to PC 7-122.

7-126. Public Concern: The Forest Service should prohibit the use of prescribed burns near caves and mines that contain bats.

BECAUSE PRESCRIBED BURNS NEAR BATS PUTS THE BATS AT RISK

Response: Standards to protect bats are detailed in Chapter 2 of the Plan.

7-127. Public Concern: The Forest Service should establish standards to minimize the effects of fire on nesting wildlife species between mid-March through June.

Response: Forest-wide standards are detailed in Chapter 2 of the Plan. Additional standard for specific management prescriptions are listed in Chapter 3. The effect of prescribed fire on nesting wildlife is discussed in Chapter 3 of the FEIS.

7-128. Public Concern: The Forest Service should develop standards to protect habitat diversity, conduct thinning of target stands, and conduct prescribed burns.

TO PROTECT MAST PRODUCING SPECIES

Response: Forest-wide standards are detailed in Chapter 2 of the Plan. Additional standards for specific management prescriptions are listed in Chapter 3.

Wildland Fire

7-129. Public Concern: The Forest Service should not conduct prescribed burns.

BECAUSE FIRES DO NOT OCCUR ON A SHORT ROTATION

BECAUSE SOUTHERN APPALACHIAN FORESTS DO NOT REQUIRE PRESCRIBED BURNS

BECAUSE PRESCRIBED BURNS MAY NEGATIVELY AFFECT FOREST ECOLOGY AND SOIL PROCESSES

Response: Fire played an important role in shaping the species rich landscape of the southeastern U.S. Fires of both natural and cultural origin were common on the landscape when the present arborescent flora migrated into the region after the last ice age, 8,000 to 10,000 years ago (Delcourt and Delcourt, 1996). Fire has been a part of the southern Appalachian landscape for longer than its current vegetation has been (Delcourt and Delcourt, 1996).

Land and Resource Management Plans provide direction for desired future conditions of ecosystems. In many cases, fire is a necessary tool to meet those desired conditions.

Objectives in Forest Service Manual 5140 are to use fire from either management ignitions or natural ignitions in a safe, carefully planned, and cost effective manner to benefit, protect, maintain, and enhance National Forest System resources; to reduce future fire suppression costs; and, to the extent possible, to restore natural ecological processes and achieve management objectives adopted in approved Forest Land and Resource Management Plans.

Smoke Management

7-130. Public Concern: The Forest Service should select a method of vegetation management other than prescribed fire.

Response: The Forest Service uses many methods of vegetation management other than fire.

7-131. Public Concern: The Forest Service should ensure that prescribed burns do not significantly contribute to any county exceeding the national ambient air quality standards.

Response: The Forest Service agrees, and this is monitored by a Zone Air Specialist.

Forest Health Management

7-132. Public Concern: The Forest Service should actively manage forests for forest health.

Response: Forest Health is, indeed, a major theme of the alternative chosen to be the Plans for the Southern Appalachian Forests. Management Prescriptions allocated to the Forests reflect a theme of ecosystem restoration and maintenance, which will, in turn promote the most healthy forest conditions possible.

7-133. Public Concern: The Forest Service should define 'forest health' management.

TO LIMIT THE DISCRECTION OF INDIVIDUAL FOREST MANAGERS

Response: The revised Plan establishes a framework for managing a National Forest in terms of goals, objectives, standards, management prescription allocations, and monitoring requirements. However, the revised Plan generally does not make decisions pertaining to site-specific activities. A NEPA-compliant analysis at the local level still needs to be accomplished before making any site-specific project decisions. It is at the project level that individual forest manager have discretion, however site-specific projects must be consistent with the direction in the revised plan.

7-134. Public Concern: The Forest Service should not conduct timber harvest or prescribed burns in Southern Appalachian forests.

BECAUSE BASS' DATA SHOWS THAT MANAGEMENT ACTIONS ARE UNNECESSARY

BECAUSE BASS' DATA SHOWS THAT SOUTHERN APPALACHIAN FORESTS WERE DOMINATED BY TALL, OLD TREES AS A STABLE ECOSYSTEM

BECAUSE THE PLANS ARE BASED ON AN EARLY SUCCESSIONAL MODEL

Response: Several commenters questioned the appropriateness of the even-aged successional model inherent in the Successional Forest Options incorporated in the Revised Plan. They frequently cited materials raised by a forest specialist that contend that Southern Appalachian forests are naturally uneven-aged, and regenerate predominately through "gap-phase dynamics" rather than by larger, more severe disturbances. Some commenters fault the Forest Service for not considering this information.

Contrary to assertions made by some commenters, information compiled by the specialist was considered during planning. It was distributed to staffs of all Southern Appalachian forests undergoing revision, and was reviewed by planners at the forest and regional levels. Points of agreement and disagreement were discussed at varying levels across these forests. There are many points of agreement, which are corroborated by a predominance of mainstream scientific literature. We agree that some major forest types in the Southern Appalachians are low disturbance systems that commonly regenerate through natural development of relatively small canopy gaps, and that frequent fire in these systems is not desirable. These areas of agreement are incorporated in the Revised Plan and EIS through direction and analysis for mesic deciduous forests, which include cove, riparian, mixed mesophytic and northern hardwood forests. This direction and analysis considers the amount of these forests allocated to Forest Successional Options 1 and 2 (which should be dominated by gap-phase processes), the need for canopy gaps within these forests, and the limited role of fire (cite Mesic Deciduous Forest Section of EIS, and appropriate objectives and standards from the Plan). There are, however, some conclusions with which we disagree, as do some members of the academic and research communities with whom we have consulted.

The specialist's presentation of forest conditions in the late 1800s and early 1900s depends heavily upon the Ashe and Ayers Report and descriptions contained in the field notes and maps of the tracts of land that were acquired for inclusion in the National Forests. He also has provided substantive literature (bibliography) to support his views. However, he rejects or ignores the substantial body of scientific literature (much of it published in the last 10 years) that contradicts his conclusions regarding the role of fire and other disturbance in maintaining upland oak and pine forest types.

Unlike the scientific literature used and cited during planning, the specialist's analysis has not been through the rigorous process of peer review, critique, and publication in mainstream scientific journals. The Forest Service contracted review of thespecialist's analysis by Paul and Hazel Delcourt of the University of Tennessee, who have published widely on historical disturbance ecology. Their written review indicates areas of agreement and disagreement similar to those identified by forest planning teams. It also is important to note that the specialist is not an ecologist or forester, professions that are educated and trained to make ecological interpretations of forest condition data. In his paper, use of terms, lack of reference to the most current scientific literature, and resulting conclusions often do not reflect the best available science. Based on these considerations, we believe the analysis was given an appropriate level of consideration during planning.

Although understanding historical and pre-European settlement conditions provides an important context for conservation planning, restoring such conditions is not an overriding objective or legal requirement for Plan revision. In most cases, ecological *conditions have changed too much for this to be feasible, let alone desirable. Plan direction represents a decision on multiple-use management informed by the best science on disturbance ecology, not an attempt to recreate historical conditions.*

Based on synthesis of the scientific literature, our understanding is that Southern Appalachian forests historically have been subject to highly variable disturbance regimes across the landscape. This variation resulted from the interaction of fire, wind, and other disturbance factors with the highly variable topography and edaphic conditions of the mountains. We disagree with the specialist, and follow most current scientific literature, in recognizing that fire, primarily of Native American origin, played an important role in maintenance of upland pine and oak forests, and open woodlands, savannas, and grasslands. Compared to today, forest structure was likely more open on upland sites, due to the influence of fire, and more heterogeneous on lower slopes and coves, due to gap-phase dynamics of older forests. Overall, within-stand structures were likely variable due to the variable effects of natural disturbance factors. Many areas would not easily be categorized as either even-aged or uneven-aged, but some level and pattern of older residual overstory trees would almost always be present, even in areas providing important early-successional habitat. This variable structure can be approximated with uneven-aged, two-aged, and even traditional even-aged management systems, all of which involve retention of varying levels of overstory structure. A patchwork of uniform even-aged stands established by clean clearcuts is clearly outside the historical range of variation of forest structure and is also clearly not the desired condition for any portion of the national forest.

Although the Revised Plan includes objectives for restoration of native fire-maintained habitats, we recognize that we will not be able to restore the influence of fire to the landscape to historical levels due to a variety of logistical and social reasons. Creation of early-successional forests can compensate for the loss of open fire-maintained habitats for some species. So, although we recognize that the mix of types of early-successional habitats maintained under the Revised Plan cannot reflect historical conditions, we have considered the overall abundance of these habitats within an historical ecological context to arrive at objective levels. As some of these fire-maintained habitats are restored, need for early-successional forest as habitat for some species will decline. However, need will not disappear; other species, such as ruffed grouse, depend upon the dense woody growth found in early-successional forests. In addition, other multiple-use considerations, such as need for habitat to support game species for recreation, ecological restoration of native forests, forest health considerations, will continue to make creation of some level of early-successional forest desirable.

Forest Health Management Activities

Forest Health Management Activities General

7-135. Public Concern: The Forest Service should implement on-the-ground management activities to restore forest health and ensure the sustainability of National Forest System lands.

Response: The planning process for the Southern Appalachians included analysis of a range of alternative management themes. The revised Plan makes strategic decisions, consistent with NFMA that "….provide for multiple use and sustained yield of goods and services from the National Forest System……" (36 CFR 219.1(a)). Strategic decisions include Desired Future Condition (DFC), Goals and Objectives to achieve DFC, and a list of activities that may be used to achieve DFC.

Many commenters expressed a desire to see national forests managed for maintenance and restoration of "natural conditions" to support healthy ecosystems, clean water, and abundant wildlife. We feel the revised Plan is in line with these priorities. Within the Southern Appalachian region, vegetation management will be driven by the need to create desired ecological condition.

7-136. Public Concern: The Forest Service should reduce basal areas in pine woodlands and savannas.

TO ENHANCE THE DEVELOPMENT OF A HERBACEOUS UNDERSTORY

Response: The Land and Resource Management Plan allows for basal area reduction in pine woodlands and savannas.

7-137. Public Concern: The Forest Service should only selectively thin forests.

Response: While selectively thinning is appropriate to accomplish some goals and objectives, other objectives can best be met with other silvicultural practices. The revised Plan permits the use of various tools and site-specific analyses will determine which methods are appropriate for a particular project.

7-138. Public Concern: The Forest Service should only conduct timber harvest as incidental to actions for habitat restoration and forest health.

Response: The revised Plan permits the use of various tools and site-specific analyses will determine which methods are appropriate for a particular project. Timber harvest is one of the tools available.

Salvage Timber Harvest

7-139. Public Concern: The Forest Service should allow salvage timber harvest.

WHILE THE TIMBER IS IN GOOD CONDITION

TO PROTECT THE FOREST AND PROVIDE EMPLOYMENT

Response: The selected alternative for the revised Plan contains goals and objectives that will be accomplished by the activity of timber harvesting, and this includes salvage timber harvesting where compatible with those goals and objectives.

Insect and Disease Management

7-140. Public Concern: The Forest Service should analyze both the effects of insects and disease and the effects of suppression activities.

ON GROWTH AND YIELD AND ON REVENUE ESTIMATIONS

Response: It was decided to not include insect and disease infestations projections into the growth and yield estimates because of the uncertainty with which to make projections in the long run over what those level of infestations might be. We do have insect and disease simulators that we considered, but these were determined to be useful for only a 10-20 year projection. The growth and yield estimates used in the SPECTRUM analysis used projections over 100 and sometimes 200 years. Therefore, it was decided to address this in a narrative fashion and explain in the EIS that the volumes do not include the effects from insects and diseases.

7-141. Public Concern: The Forest Service should specify that insects and disease will be allowed to move through riparian zones.

TO STEER MANAGERS TOWARD A MORE ECOLOGICAL AND ECONOMICAL STRATEGY

Response: The revised Plan includes standards for riparian zone in Chapter 2 and 3 to which include standards for insects and disease. Conditions of a particular infestation will determine specific control and suppression methods and will require a site-specific decision.

Noxious Weed Management

7-142. Public Concern: The Forest Service should not control invasive species that are beneficial to wildlife.

BECAUSE SUCH SPECIES WILL BE MAINTAINED NATURALLY BY WILDLIFE

Response: According to Executive Order 13112, all federal agencies are required to work to prevent and control the introduction and spread of invasive species. In addition, this executive order states that federal agencies are not authorized to fund or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species.

7-143. Public Concern: The Forest Service should analyze the effects of non-native species.

ON THE ALABAMA NATIONAL FOREST

Response: The effects of non-native species is discussed in the Forest Health section of the FEIS in Chapter 3B.

Herbicides and Pesticides

7-144. Public Concern: The Forest Service should use herbicides and integrated vegetation management for appropriate management activities when they are the most effective and economical means.

Response: Thank you.

7-145. Public Concern: The Forest Service should provide goals and standards, as recommended, addressing where and when herbicides can be used near water.

TO PROTECT DRINKING WATER

Response: The standards for application of herbicides, from the FEIS for Vegetation management as Supplemented have been detailed in Chapter 2 of the Plan.

7-146. Public Concern: The Forest Service should modify FW-116 and restrict the use of herbicides within 200 feet of streams or passages to streams, in addition to requiring a site-specific analysis.

Response: The standards for application of herbicides, from the FEIS for Vegetation management as Supplemented have been detailed in Chapter 2 of the Plan.

7-147. Public Concern: The Forest Service should rely on natural controls for insects rather than insecticides.

Response: As discussed in chapters 2 and 3 of the Plan, integrated pest management strategies will be used to manage and control insect infestations. Natural controls may be utilized where appropriate.

7-148. Public Concern: The Forest Service should adopt several, specific forest-wide standards for herbicide use designed to minimize risks to humans, wildlife, and the environment.

Response: Appropriate standards from the FEIS for Vegetation Management in the Coastal Plan and Piedmont and the FEIS for Vegetation Management in the Appalachian

Mountains have been brought forward in the plan. The standards for herbicide use can be found in chapter 2 of the plan.

Mineral Resource Management

7-149. Public Concern: The Forest Service should not allow mineral development.

BECAUSE PRESCRIPTION GOALS WILL NOT BE MET

BECAUSE MINERAL DEVELOPMENT IS INCOMPATIBLE WITH RESTORATION AND RECREATION GOALS

ON HERITAGE SITES

Response: Chapter 3, Section 3.A Physical Elements has been revised to address the effects of mineral development. While 92.6% of the federal minerals within the Forest are available for leasing and mineral development, future development is subject to the constraints of the standard lease terms, or lease stipulations required by the specific prescription area standards. For example, the lands within canyon corridors will be leased subject to a no surface occupancy stipulation. Lands subject to mineral development will be restored in accordance with the conditions and standards identified during the site-specific analysis of future proposals, based on the standards and guidelines of the appropriate prescription area.

The Surface Mining Control and Reclamation Act of 1977 prohibits surface mining (strip mining) of federal minerals east of the 100th meridian, therefore no surface mining of Federal minerals can occur on the NFs in Alabama.

Site-specific analysis of the impacts of a proposal will occur when an Application for Permit to Drill (APD), or special use permit application, is received. Based on the project level analysis, appropriate mitigation measures will be required as conditions of the project approval.

7-150. Public Concern: The Forest Service should adequately address the effects of sand and gravel exploration on historic Native American sites.

Response: The Alabama Historic Commission refers to the activities along the Tallapoosa River that has destroyed many proto-historic and historic Creek Indian villages in their comment. The sand and gravel exploration that has taken place on Forest Service land is not on that scale. Section 106 of the National Historic Preservation Act (NHPA) directs the Forest Service to take into consideration the effects of all undertakings, including sand and gravel exploration, on heritage sites, including historic Native American sites.

7-151. Public Concern: The Forest Service should specify criteria to mitigate ecosystem habitats negatively affected by mineral development.

Response: Inclusion of stipulations at time of lease issuance, such as the "no surface use" or "controlled surface use" stipulations facilitates protection of ecosystem habitats. Site-specific analysis of the impacts of a proposal will occur when an Application for Permit to Drill (APD), or special use permit application, is received. Based on the project level analysis, appropriate mitigation measures will be required as conditions of the project approval.

Leasable (Oil, Gas, Coal, Pipelines)

7-152. Public Concern: The Forest Service should adequately address the effects of oil and gas exploration and development.

ON HERITAGE SITES

Response: Chapter 3, Section 3.A Physical Elements, has been revised to address the effects of mineral development based on the Bureau of Land Management's Reasonable and Foreseeable Development Scenario, available for review at the Forest Supervisor's Office.

Site-specific analysis of the impacts of a proposal will occur when an Application for Permit to Drill (APD), or special use permit application, is received. Based on the project level analysis, appropriate mitigation measures will be required as conditions of the project approval.

7-153. Public Concern: The Forest Service should more fully explain the operation and examine the potential for leaks from natural gas wells on the forest.

AS WELL AS THEIR POTENTIAL AIR QUALITY IMPACTS

AS WELL AS FIRE PROTECTION AND EMERGENCY MANAGEMENT AND SAFETY PLANS

AS WELL AS THE STANDARDS AND MEASURES TO CONTAIN POTENTIAL POLLUTION

AS WELL AS THE MONITORING PROGRAM AND COMMITMENTS TO CONTINUE IT

Response: Clarification on minerals operations including oil and gas operations in included in Chapter 3b of the FEIS.

7-154. Public Concern: The Forest Service should discuss the potential for coal mining.

PARTICULARLY ON THE BANKHEAD MANAGEMENT AREA

Response: Chapter 3, Section 3.A Physical Elements, has been revised to address the effects of mineral development based on the Bureau of Land Management's Reasonable

<u>and Foreseeable Development Scenario,</u> available for review at the Forest Supervisor's Office. This includes a discussion on potential coal mining.

Site-specific analysis of the impacts of a proposal will occur when an Application for Permit to Drill (APD), or special use permit application, is received. Based on the project level analysis, appropriate mitigation measures will be required as conditions of the project approval.

Utility and Communication Infrastructure — General

7-155. Public Concern: The Forest Service should ensure that utility providers have access to their transmission lines.

Response: Reasonable access is granted with special use authorizations. The revised Plan determines the general framework for where special uses are allowed, while site-specific decision will actually authorize the use.

Utility Facilities and Communication Sites

7-156. Public Concern: The Forest Service should include an additional goal to require utility corridors and communication sites to minimize environmental, social, and visual impacts.

Response: The forest-wide goals, objectives and standards along with standards of the various management prescriptions accomplish this and an additional goal is not necessary.

7-157. Public Concern: The Forest Service should include an additional standard to limit utility corridors and communication sites in certain management prescriptions.

Response: EPA appears to suggest that a FW standard be added that addresses basically what is already stated in several other individual prescriptions,"for ease of interpretaion". This is not a land management issue but rather a formatting suggestion. Since addressing utility corridors and communications sites in the various prescriptions is consistent with how other similar management issues have been address, then it should remain as written for that reason.

Chapter 8

Social and Economic Values

Social Values (General)

Social Values

8-1. Public Concern: The Forest Service should preserve National Forest System lands.

Response: The revised Plans address 12 common issues and other local issues that include the wide range of desires, wants, needs, and concerns that have been expressed by the users of the national forests. Often times, meeting one set of needs/concerns is in conflict with meeting other needs/concerns. The challenge is to try to find the appropriate level of management that will best address all these issues. The Record of Decision explains how the Selected Alternative is the alternative that does the best job of trying to meet the public's demands while protecting the resources

8-2. Public Concern: The Forest Service should educate the public to use National Forest System lands responsibly.

Response: As stated in Chapter 2 of the revised Plan, natural resource education and public involvement are cornerstones of the Forest Service mission. Chapter 2 also discusses goals and objectives for education and public involvement.

8-3. Public Concern: The Forest Service should keep a seventh-generation perspective.

Response: The planning horizon for the revised Plans is 5 decades.

8-4. Public Concern: The Forest Service should clean up illegal dumps.

Response: We agree that cleaning up illegal dumps is important; however, that is a site-specific project, not a Plan level decision, and is not precluded by this process.

Economic Values

Economic Values (General)

8-5. Public Concern: The Forest Service should raise property taxes.

Response: Levying taxes is outside the authority of the USDA Forest Service and is a function of state and local governments.

Contribution/Role of Agency-Administered Lands and Resources to Economy

8-6. Public Concern: The Forest Service should better explain the use of the IMPLAN model and the employment and income impacts of the separate alternatives.

Response: Regional economics models dealing with input-output analysis are very complex. Their use involves a number of assumptions and judgment factors that may make the findings by two different analysts somewhat different. The IMPLAN model takes a considerable amount of time to learn and to become proficient. Forest Service users have invested considerable amounts of time in training in model building. Therefore, replication and validation by another source may not be likely for a novice user. Important assumptions have been documented in the FEAST spreadsheet that is part of the Process Records. Data sources have been described in Appendix B of the EIS.

Appendix B gives a general overview of how the impact results were generated for each resource or activity on the National Forests in Alabama. Because it is not expected that someone who is unfamiliar with IMPLAN could readily perform input-output analysis, a detailed explanation of every step in building the model and constructing individual resource and activity impact files was not made a part of Appendix B. If the commenter wants to know the procedural process for running IMPLAN, we refer them to "IMPLAN Professional User's, Analysis Guide and Data Guide", Minnesota IMPLAN Group, Inc., 1997, which is part of the Process Records of each forest. The Minnesota IMPLAN Group also offers training classes for model usage.

The various Forest Service resources and activities are discussed on pages B-15 -16 Appendix B. Resource and budget impacts from the IMPLAN model and FEAST spreadsheet are presented and discussed on pages 3D-471 – 475 of the DEIS. We feel this is an adequate description.

Net Public Benefit and Agency Accounting

8-7. Public Concern: The Forest Service should identify and consider economic issues and impacts.

Response: The DEIS analysis of the economics of the forest analysis area was constructed to comply with 36 CFR 219.12 and the Forest Service Manual and

Handbooks, FSM 1970 and FSH 1909.17, respectively. These directives suggest that the Forest conduct an impact analysis showing expected jobs and income associated with the consumption of resources and expenditures from a forest (an equity analysis that shows how a dollar of expected demand for a resource is divided among the various sectors of an economy). The impact tables presented in Chapter 3 of the DEIS satisfies this requirement. Secondly, the directives provide for a present net valuation (an efficiency analysis to show how well expected revenues cover expected costs) of the resource programs showing a discounted value for the estimates of benefits and the costs for conducting these programs over the planning horizon. The present net value tables are likewise shown in Chapter 3 of the DEIS.

Any economic issues that develop in our dialog with the public will also be addressed. For these forests, no additional issues specific to a given forest were raised from the public.

The DEIS presents a mix of goods and service outputs from its SPECTRUM model which has been fully documented in Appendix B.

Output valuations are given in tables of Appendix B (p. B-18). These tables have been revised to better reflect the sources of the valuations.

Demand-Supply analyses are presented as part of the "Analysis of the Management Situation (AMS) which is not automatically made part of the DEIS. Attention to the supply and demand for Wildlife is a part of the AMS and in the forests' "Process Records".

Because of the vast uncertainty of prices and inflation in future years, most prices used in these forests analyses were in constant 2000 prices. When estimates of real price increases were available for historical data before 2000, real price adjustments were made to year 2000. Future prices were not increased. This is theoretically acceptable when a present net value analysis is discounted in real terms as was done in this analysis.

Timber and some recreation impacts in these analyses are qualified with the term that the resulting jobs are "associated" with the resource consumption rather than the jobs are caused by the consumption because there may be other landowners who would satisfy local timber demand if the Forest Service did not offer timber for sale; or local Forest Service recreation users may spend their recreation dollars on other non-wild-land recreation events if they did not visit a local forest. Therefore, impacts would be similar for both these resources even if they were not consumed on national forest lands. Impact estimates are given to show the decision maker the relative importance of the Forests' resource consumption in the local community and have no other purpose, as you seem to intimate with your comment that a "social efficient" policy would be to log no government timber.

All resources whether valued or not are considered in "maximizing net public benefits" to the public. The decision maker has a quantification of those resources that can be priced whether market based or non-marker based of an assigned value. The "weight" of resources is the result of SPECTRUM analyses. Some non-market, non-priced resources such as visual or water quality may be a subjective factor in the maximization of net public benefits. Ultimately, the choice of the preferred alternative is up to that the forest and the Regional Forester. When the Record of Decision is released, the rationale for choosing a given alternative will be addressed.

The efficiency analysis requirements explained in FSH 1909.17 combines market and non-market resources. The Forest Service defines and economic efficiency analysis as containing these two components. A financial analysis required for project timber sales is solely a market commodity resource analysis.

The various expected effects of these Forests' programs are presented in Chapter 3. Where adverse circumstances are found, mitigation measures are discussed. The expenses for these measures are incorporated into the program expense that is accounted for in the Forest budget. We therefore believe that we have accounted for what is expected for an economic analysis that is explained in our Handbook.

8-8. Public Concern: The Forest Service should better determine the combination of forest resources that will maximize net public benefit.

Response: One of the contentions in this comment is that the DEIS failed to include all benefits and costs in the economic efficiency analysis for the understanding of the maximization on net public benefits. Because these items were omitted, the Forest Service had not complied with the guidelines of 36 CFR 219.

The Forest Service does not use its socio-economic analysis quantified measures and indexes as the sole means of displaying alternative outputs (FSM 1970.8(5)). Such a value is one piece of information for the decision maker to use in selecting among alternatives. Other resources that are impacted are discussed qualitatively. Their consequences in forest management are decided along with the monetized resource in arriving at an alternative that maximizes net public benefits. After reviewing the planning documentation and comments from the public participation, the determination of the best alternative that maximizes public net benefits is left to the judgment of the decision maker. Rationale for the selected alternative is given in the Record of Decision.

The Forest Service's goal has been to use the best available data in the preparation of the Southern Appalachian Plan revisions. The best available data for vegetation included the CISC data for each Forest involved. CISC data has always been mandated *to be kept current and accurate by field exams over time. We feel the CISC record is valid for the purposes used in the revision analysis.*

The DEIS analysis of the economics of the forest analysis area was constructed to comply with 36 CFR 219.12 and the Forest Service Manual and Handbooks FSH 1909.17 and FSM 1970, respectively. These directives suggest that the Forest conduct an impact analysis showing expected jobs and income associated with the consumption of resources and expenditures from a forest (an equity analysis of how a dollar of expected demand for a resource is divided among the various sectors of an economy). The impact tables presented in Chapter 3 of the DEIS satisfies this requirement. The "weight" of resources is the result of SPECTRUM analyses. Some non-market, non-priced resources such as visual or water quality may be a subjective factor in the maximization of net public benefits. Ultimately, the choice of the preferred alternative is up to that the Forest and the Regional Forester. When the Record of Decision is released, the rationale for choosing a given alternative will be addressed.

The efficiency analysis requirements explained in FSH 1909.17 combines market and non-market resources. The Forest Service defines and economic efficiency analysis as containing these two components. A financial analysis required for project timber sale is solely a market commodity resource analysis.

Another issue under this comment is that public and non-public timber are not perfect substitutes because the public prefers environmental values to commodity production and therefore there is a cost to the public of "timbering" on NF lands that does not occur on private lands, and the net benefits from timber production are overstated in the present net value analysis. Contrary to what the commenter claims, logging does not necessarily cause most environmental values to be significantly diminished or entirely eliminated. Logging is only conducted on a portion of all national forest lands, and the interval between repeat entries onto the same area is often measured in decades. When logging is undertaken, it is conducted in accordance with revised Plan standards and guidelines designed to protect other resource values. Logged areas are regenerated to a new forest, so any disruption of services is only temporary. Finally, it is important to recognize that some environmental values – e.g., wildlife habitat – may actually benefit from logging. This last point is indicative of a larger problem. The commenter focuses exclusively on the potential negative effects of logging; they ignore the fact that national forest logging can have external benefits as well as costs.

8-9. Public Concern: The Forest Service should use mathematical modeling techniques to identify the most economically efficient solution to meet the goals and objectives of any alternative.

Response: This involves responding to a number of questions specific to the SPECTRUM model:

<u>Question</u> - Where were the resource dollar values obtained? Please provide references. Why were these values deemed appropriate for the Forest? Do the values represent measures of consumer willingness-to-pay? If not, why not?
<u>Response</u> – See the table presenting the Economic Benefits and Financial Revenue Values of the DEIS for these Southern Appalachian forests. The values presented in this table represent market values for Timber and Minerals and assigned values from benefit transfer studies of willingness to pay used by NFS Research for Recreation and Wildlife.

<u>Question</u> - Where were the resource physical output units used for the cost benefit analysis obtained? We can find no reference to them in the DEIS, appendices or draft Plan.
<u>Response</u> – The timber product estimates were taken from the SPECTRUM model and the recreation/wildlife/fish estimates were derived from NVUM (National Visitor Use Monitoring) results. The full procedure for estimating the recreation/wildlife/fish estimates can be found in the process records.

<u>Question</u> - Did the cost benefit analysis include the amount and value of the environmental impacts (e.g. the value of social losses) due to forest harvesting? If not, please provide an explanation for this oversight.
<u>Response</u> – These Southern Appalachian forests have presented a present net value of resources which are suggested in 36 CFR 219.12(g)(1). The forests have discussed only foreseen consequences of our land management alternatives on the environment in a narrative fashion. For those resources that can be reasonably valued via market data (e.g. timber, minerals) and for those non-market resources that have Forest Service estimated values from Forest Service Research, we have presented values in the present net value calculation. For resources that have no values estimated by generally accepted methods, we have chosen to discuss them in a narrative fashion as part of the assessment of net public benefits. Such an economic efficiency analysis is prescribed in the Forest Service Handbook FSH 1009.17, Chapter 10. The discussion of how the selected alternative maximizes net public benefits can be found in the Record of Decision.

Many of the "ecosystem services" or "social losses" that you refer to are considered effects remote from resource management of these forests. Their speculative and unforeseen nature does not warrant a consideration in the efficiency analysis required by 36 CFR 219. Resource effects on other resources are discussed in Chapter 3 of the EIS.

<u>Question</u> - Why was a 4% discount rate used when everything is in real terms? The rate probably should be closer to 2%.
<u>Response</u> – Agency policy makes provision for using a 4 percent <u>real</u> discount rate for long-term resource program analyses in the FSH 1909.17, 15.42.

<u>Question</u> - Why wasn't a more recent price for an RVD used? How does this value compare to travel cost and contingent valuation study values?
<u>Response</u> – The most recent information available at the time of our analysis are prices expressed in 1989 dollars and estimated from 1989 to 2040, which are found in the FS publication "Resource Pricing and Valuation Procedures for the Recommended 1990 RPA Program". We estimated the real price growth to year 2000 and adjusted the values to reflect 2000 prices. Forest Service non-market valuations for forest planning are provided by Forest Service Research and Forest Service Strategic Planning and Resource Assessment in the Washington Office, and they are working on updating these values, but that information is not yet available. The values used are found in Appendix B in the table presenting the Economic Benefits and Financial Revenue Values of the DEIS.

<u>Question</u> - Are recreation and wildlife/fish really a constant throughout all alternatives? This seems very odd, particularly given that the nature of these experiences will vary substantially between alternatives. Disaggregation of visitor days/expenditures by recreation type, and disaggregation of visitor days by recreation type for each alternative appears called for. This type of analysis certainly isn't visible in the employment and labor income tables.
<u>Response</u> – The Forest attempted to accommodate the desired emphasis for the various alternatives by the application of the management prescriptions. Different prescriptions create different recreation settings. Some alternatives were designed to have better settings for recreation than others. However, the Forest made an assumption that recreation budgets and facilities would remain essentially stable during the life of the Plan. Therefore, for purpose of comparison of alternatives, labor income is projected as constant across the alternatives.

Wildlife habitat is affected by the management prescriptions applied. The various alternatives favor particular species by the creation of habitat. However, for the comparison of alternatives, the Forest made an assumption that what would be lost for one wildlife value in a particular alternative would be gained in another. This would lead to wildlife and fish labor income being flat for purposes of comparing the alternatives.

<u>Question</u> - Without disaggregated data one cannot infer changes in size of either outflows or inflows from changes in the net flow. Just because tourism is a larger net importer in 1996 than 1985 does not imply that "travelers were not coming into the analysis area at a greater rate in 1996 than 1985." More could be coming in (more exports), but were swamped by a greater increase in imports, making the net imports larger. Overall, there seems to be confusion between demand and supply in the analysis. Just because recreation facilities are developed doesn't mean they will be used. Nor does current usage imply that there might not be a supply constraint so that actual demand exceeds current usage.

Response – The comment is apparently referring to tables B-139 in the Cherokee NF DEIS appendix B and B-16 in the NF in Alabama DEIS. The implication of the trade flows for the NF in Alabama is that more tourism dollars have left the economy since 1985 (that is, people are leaving their impact areas and traveling outside for tourism experiences than in 1985; this is a net import of tourism because trade dollars are leaving the local analysis areas). For the Cherokee NF 1996 shows tourism to be a net exporter of dollars to the local economy over 1985 (that is, more people are coming into the local analysis area to recreate and visit than are going outside the area). Your statement of more tourists coming into the analysis area (exports), being swamped by a greater increase in imports (people and dollars leaving the area) making net imports larger is a true statement for the National Forests in Alabama, but that is not the case for the Cherokee NF. It is uncertain what you are referring to by stating the need for "disaggregated data" to infer how trade flows are occurring. Our trade flows are simply estimates of industry shares that comprise tourism. Table B-16 of Appendix B (for NF in Alabama) and Table B-139 (for the Cherokee NF) show the disaggregated industry make-up of tourism. We stand by the analysis in our DEIS.

Question - The DEIS states, "For each decade, an average annual resource value was estimated, multiplied by 10 years, and discounted from the mid-point of each decade." The Forest uses 2000 timber and resource prices, and all values are stated in 2000 prices. Are estimated changes in real prices over time accounted for? Are effects of technology accounted for? Is income growth accounted for?
Response – All resources were assumed to be priced in 2000 constant dollars in order to be conservative with the analysis, hence technology and income growth are not accounted for in price estimations. Having a conservative Present Net Value analysis that is still positive indicates a good certainty in your program objectives of achieieving the Forest Service hurdle rate of 4 percent. Predicting income growth and technology changes for the Forest Service planning horizon (50 years) would be pure speculation.

Question - There is a reasonably good discussion of prices used (except for timber), but too little discussion of the assumptions in the analysis and the issues raised by it. For instance, trends in real prices should be taken into account. There is every reason to believe that the value of various natural experiences will rise over time as population and income rise while less and less natural areas are available to the public either through development or posting. This should be accounted for. Water production increasingly is an issue in the southeast as clean water becomes relatively scarcer. That price per unit should be rising in real terms also.
Response – Because of the vast uncertainty of prices and inflation in future years, most prices used in these forests' analyses were in constant 2000 prices. When estimates of real price increases were available for historical data before 2000, real price adjustments were made to year 2000. Future prices were not increased. This is theoretically acceptable when a present net value analysis is discounted in real terms as was done in this analysis. Forest Service planning horizons are 50 years. Trying to estimate expected real price increase over this time period is pure speculation. A more

conservative method is to use constant 2000 prices and costs to see if expected program benefits will satisfactorily cover expected program costs.

Question - Note that, since timber is coming off of NF land, where the public prefers environmental values to commodity production (see above), there is a cost to the public of timbering on NF lands that does not exist when the timbering occurs on private lands. I.e., NF timbering and NIPF timbering are not perfect substitutes from a public perspective. As a result, net benefits from timber production are overstated in the present net value of the alternatives. What about non-consumptive values, such as existence and option values (the willingness of the public to pay for knowing that something exists, even though they never intend to see or use it, and the willingness to pay to have the option of sometime using the resource)?
Response – The U.S. Forest Service's does not attempt to fully enumerate the dollar values of all non-market, non-priced benefits and costs in the planning process that may be of a speculative nature. The agency does, however, attempt to provide as much relevant information as possible to aid in making good planning decisions, and this information may sometimes take the form of monetary estimates of non-commodity values as presented in the Present Net Value tables. U.S. Forest Service activities on the forest are governed by a large number of rules and regulations designed to mitigate negative impacts or otherwise protect forest resources. In the planning process these benefits associated with regulations are seldom quantified in dollar terms. The costs for achieving these benefits are in the form of increased operating costs and reduced timber revenues.

36 CFR 219.12(g) (1) instructs revised Plan development by requiring an analysis of expected outputs during various planning periods. It suggests use of outputs that include marketable goods and services as well as non-market items, such as recreation and wilderness use, and wildlife and fish. These are the resources the forests' FEIS has undertaken to show a present net value as required by 36 CFR 219.

All the Southern Appalachian forests have presented a present net value of resources which are suggested in 36 CFR 219.12(g)(1). These forests have discussed only foreseen consequences of our land management alternatives on the environment in a narrative fashion. For those resources that can be reasonably valued via market data (e.g. timber, minerals) and for those non-market resources that have Forest Service estimated values from Forest Service Research, we have presented values in the present net value calculation. For resources that have no values estimated by generally accepted methods and have a significant part in the selected alternative, we will discuss them in a narrative fashion in the Record of Decision as part of the consideration for maximizing net public benefits.

Many of the "environmental values" that you allude to that are provided by forested land, such as flood control, purification of water, recycling of nutrients and wastes, production of soils, carbon sequestering, pollination, and natural control of pests; and *externalized costs of resource extraction, such as increased rates of death, injury and property damage resulting from accidents involving heavy equipment, log trucks, ORVs and other dangers related to intensive resource use and development, are considered to be either effects remote from resource management or mitigation measures have been discussed in Chapter 3 of the FEIS to prevent many adverse consequences of logging on these forests. For those items we consider speculative and unforeseen, their consideration in the efficiency analysis required by 36 CFR 219 is not warranted. Option values and existence values are not items required to be discussed under 36 CFR 219. These highly controversial methodologies can be of a contentious nature with many publics. The Forest Service has chosen not to use values based on questionable and controversial methodologies and values not specifically required by Forest Service directives.*

The consequences of the forests' programs on the water and wildlife resources are discussed in Chapter 3 of the DEIS. These discussions have offered mitigation measures where the resource may be affected by the timber program. Therefore, adverse effects are believed to be minimal.

<u>Question</u> - Finally, the analysis fails to discuss the weights placed on non-priced goods and services produced by the Forest and, as such, fails to inform the reader how Alternative I came to be the preferred alternative. Please provide an explanation as to how this was determined.
<u>Response</u> – The rationale for the selected alternative is documented in the Record of Decision. This rationale explains how the selected alternative maximizes "net public benefits" which is not to be confused with "present net value". "Net public benefits" includes considering those "benefits" and "costs" that cannot be quantified.

8-10. Public Concern: The Forest Service should clarify the meaning of the SPECTRUM linear programming solution.

Response: This involves responding to a number of questions specific to the SPECTRUM model:

<u>Question</u> - What are the linear programming (LP) decision variables used in the SPECTRUM model formulations?
<u>Response</u> – The SPECTRUM model is comprised of analysis units (areas of land) and different silvicultural management options are available to each analysis unit, including the option of "doing nothing". These silvicultural options include different combinations of thinnings, final harvest methods (e.g., clearcutting, shelterwoods, group selection), and different rotation ages. These different options comprise the "decision variables" in the model.

<u>Question</u> - What is the LP solution algorithm? Does SPECTRUM use the Simplex method, an integer programming solution or a heuristic solution algorithm?

Response – SPECTRUM actually uses a linear program software program called C-WHIZ, which in turn uses the Simplex method.

Question - In the SPECTRUM LP solutions, will any specific forest analysis unit drop out of the timber harvest solution if it has a negative NPV? In other words, does the LP solution retain analysis units in the harvest solution that are themselves unprofitable to harvest?
Response – This depends on the objective function and the set of constraints being used. In determining suited acres, lands can have a negative NPV and still be a part of the suited land base. There are three "stages" to determining suitability, and a part of that analysis is based on meeting Plan objectives. If some lands with a negative NPV are needed to meet a particular objective (which would be entered into the SPECTRUM model as a constraint), then they could become a part of the suited land base.

Cost Benefit Analysis (General)

8-11. Public Concern: The Forest Service should further develop an analysis of average annual cash flows and non-cash benefits.

Response: Table 03 of 1909.12, 4.13 has not been included in the DEIS. A similar table is part of the Process Record. It shows undiscounted as well as discounted decade costs and revenues by alternative and by program.

Non-Market Products and Services (Valuation/Externalities)

8-12. Public Concern: The Forest Service should include an analysis of externalities in the DEIS.

Response: The expected physical effects of resource program implementation of the Forest are discussed in Chapter 3 of the DEIS. Where adverse effects may occur, mitigation measures are prescribed to ameliorate those possibilities.

Your contention that timber harvests develop costs that occur to the environment ("externalities") such as:

1. *Costs take the form of lost jobs and lost revenues to businesses such as those engaged in wilderness recreation outfitting or the gathering of non-timber forest products.*
2. *Costs that take the form of increased expenditures for environmental quality. For instance, when water quality is degraded, municipalities, businesses, and residents downstream are forced to incur higher costs of filtering water.*
3. *Extractive activities on national forests create additional costs, as well, such as increased rates of death, injury and property damage resulting from accidents involving heavy equipment, log trucks, ORVs, and other dangers related to intensive resource use and development. Such uses also contribute to increased*

> *fire risk on national forests, not only due to adverse changes in vegetation structure and composition, but due to increased human access.*

Many of the "externalized" costs that you enumerate are considered effects remote from resource management on the National Forests in Alabama. Their speculative and unforeseen nature does not warrant a consideration in the efficiency analysis required by 36 CFR 219.

When logging is undertaken, it is conducted in accordance with the revised Plan standards and guidelines designed to protect other resource values. Logged areas are regenerated to a new forest, so any disruption is only temporary. The commenter focuses exclusively on the potential negative effects of logging; they ignore the fact that national forest logging can have external benefits as well as costs.

The National Forests in Alabama believe they have analyzed the expected *costs and benefits of their resource programs in accordance with 36 CFR 219.12.*

8-13. Public Concern: The Forest Service should develop quantified monetary values for ecosystem services and incorporate these values into the DEIS.

Comments from these parties relate to allegations of "ecosystem services" of standing timber and externalities of resource extraction programs that were not assessed for allocating lands suitable for timber production in the DEIS. The contention is that the DEIS failed to include these benefits and costs in the economic efficiency analysis for the understanding of the maximization on net public benefits. Because these items were omitted, the Forest Service had not complied with the guidelines of 36 CFR 219.

Response: 36 CFR 219.12(g)(1) instructs revised Plan development by requiring an analysis of expected outputs during the planning period. It suggests use of outputs that include marketable goods and services as well as non-market items, such as recreation and wilderness use, wildlife and fish, protection and enhancement of soil, water, and air, and preservation of aesthetic and cultural resource values. These are the resources the forest DEIS has undertaken to show a present net value as required by 36 CFR 219.

The National Forests in Alabama have presented a present net value of resources which are suggested in 36 CFR 219.12(g)(1). The forest has discussed only foreseen consequences of our land management alternatives on the environment in a narrative fashion. For those resources that can be reasonably valued via market data (e.g. timber, minerals, range) and for those non-market resources that have Forest Service estimated values from Forest Service Research, we have presented values in the present net value calculation. For resources that have no values estimated by generally *accepted methods, we have chosen to discuss them in a narrative fashion as part of the assessment of net public benefits.*

Many of the "ecosystem services" provided by forested land, such as flood control, purification of water, recycling of nutrients and wastes, production of soils, carbon sequestering, pollination, and natural control of pests; and externalized costs of resource extraction, such as increased rates of death, injury and property damage resulting from accidents involving heavy equipment, log trucks, ORVs and other dangers related to intensive resource use and development, are considered effects remote from resource management on the National Forests in Alabama. Their speculative and unforeseen nature does not warrant a consideration in the efficiency analysis required by 36 CFR 219.

Contrary to what the commenter claims, logging does not necessarily cause most ecosystem services to be significantly diminished or entirely eliminated. Logging is only conducted on a portion of all national forest lands, and the interval between repeat entries onto the same area is often measured in decades. When logging is undertaken, it is conducted in accordance with the revised Plan standards and guidelines designed to protect other resource values. Logged areas are regenerated to a new forest, so any disruption of services is only temporary. Finally, it is important to recognize that some ecosystem services – e.g., wildlife habitat – may actually benefit from logging. This last point is indicative of a larger problem. The commenter focuses exclusively on the potential negative effects of logging; they ignore the fact that national forest logging can have external benefits as well as costs.

Lastly, the Forest Service does not use its socio-economic analysis quantified measures and indexes as the sole means of displaying alternative inputs (FSM 1970.8(5)). Such a value is one piece of information for the decision maker to use in selecting among alternatives. Other resources that are impacted are discussed qualitatively. Their consequences in forest management are decided along with the monetized resource in arriving at an alternative that maximizes net public benefits. After reviewing the planning documentation and comments from the public participation, the determination of the best alternative that maximizes public net benefits is left to the judgment of the decision maker.

U.S. Forest Service activities on the forest are governed by a large number of rules and regulations designed to mitigate negative impacts or otherwise protect forest resources. In the planning process, these benefits associated with regulations are seldom quantified in dollar terms. The costs for achieving these benefits are in the form of increased operating costs and reduced timber revenues.

Therefore, it is the U.S. Forest Service's policy to fully enumerate the dollar values of all market and non-market benefits and costs in the planning process that can reasonably *be expected to occur in an attempt to provide as much relevant information as possible to aid in making good planning decisions.*

APPENDIX K

Biological Evaluation of Regional Forester's Sensitive Species

PROGRAMMATIC BIOLOGICAL EVALUATION
of
REGIONAL FORESTER'S SENSITIVE SPECIES

REVISED LAND AND RESOURCE MANAGEMENT PLAN
NATIONAL FORESTS IN ALABAMA

PROGRAMMATIC BIOLOGICAL EVALUATION
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NATIONAL FORESTS IN ALABAMA

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NATIONAL FORESTS IN ALABAMA
Supervisor's Office
Montgomery, Alabama
Bankhead, Conecuh, Talladega & Tuskegee National Forests

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(FSM 2672.4)
of
REGIONAL FORESTER'S SENSITIVE SPECIES

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Bankhead, Conecuh, Oakmulgee, Shoal Creek, Talladega & Tuskegee

I. INTRODUCTION

This Biological Evaluation (BE) is prepared in compliance with policy outlined at Forest Service Manual (FSM) 2670. This policy is designed to avoid impacts that may cause a trend toward listing of a species under the Endangered Species Act, or loss of species viability. A comprehensive analysis of effects of plan revision alternatives on habitats, and the implication of these effects to species viability, is included in the Environmental Impact Statement (EIS) prepared with the revised Plan. This Biological Evaluation relies heavily on that analysis, but also incorporates additional species-specific considerations where warranted. This BE addresses expected effects under the preferred alternative (Alternative I) only. Relative effects of alternatives on Sensitive Species and other species of potential viability concern can be found in the EIS.

In support of the terrestrial species viability analysis in the EIS, a database was prepared through a Participating Agreement with NatureServe, previously the science information branch of The Nature Conservancy. This database provides information on the status and habitat relationships of Sensitive Species. Information in this database was referenced during preparation of this BE, and is incorporated here by reference. Similarly, for the aquatic species viability analysis, a database was prepared that identified species' sensitivity to environmental factors, their distribution by watershed, and an assessment of indicators of watershed condition by watershed. This information was also referenced during preparation of this BE, and is incorporated here by reference.

The direction in the revised Forest Plan is general and does not preclude or replace the requirement for specific, project-level consideration of Sensitive Species. Projects will be evaluated for the need to inventory project areas for these species in accordance with the Region 8 supplement to the Forest Service Manual §2672. This project-level consideration provides another facet of protection for these species in addition to Plan direction. Analysis of effects in this biological evaluation includes the expectation that these project-level processes will be appropriately followed during Plan implementation.

II. PROPOSED ALTERNATIVE

This BE addresses expected effects under the preferred alternative (Alternative I) only. The preferred alternative emphasizes management of forest ecosystems through restoration and maintenance—which ensures healthy watersheds; provides for sustainable and diverse ecosystems that support viable plant, wildlife, and fish populations; and provides for high quality, nature-based recreation opportunities, especially in non-motorized settings with high quality landscapes. Emphasis on restoration and maintenance of forest ecosystems and rare communities would be expected to have additional benefits for sensitive species.

III. AFFECTED AREA

The National Forests in Alabama are seperated into five distinct management areas, which are geographically isolated from one another by large expanses of primarily private lands (See Map 1). These National Forest units are part of the Bankhead, Conecuh, Talladega and Tuskegee National Forests. The Talladega National Forest consists of three units: The Oakmulgee, Shoal Creek and Talladega Ranger Districts. Because the Shoal Creek and Talladega Divisions share the same ecoregions and similar habitat as well as species, these units have been placed together for the analysis process.

Desired future conditions for each management area resulted in the management direction detailed in Chapter 4 of the Revised Forest Plan (January 2003). Unit acres were taken from the Environmental Impact Statement (DEIS) Appendices, Appendix B, Table B-2, and have been rounded to the nearest thousand. The affected areas of proposed management are described below :

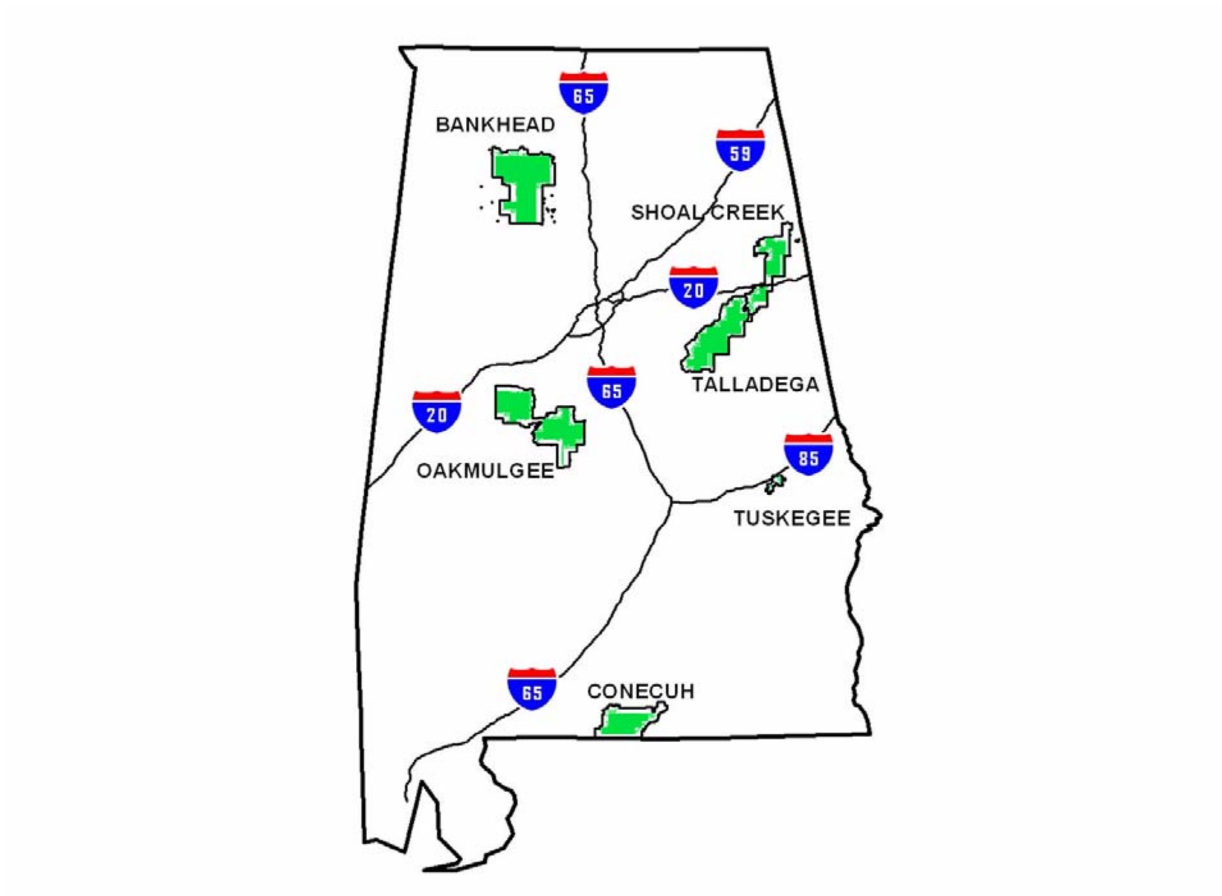
The **Bankhead National Forest** consists of nearly 182,000 acres. Forest ownership is in Lawrence, Franklin and Winston Counties, in northwest Alabama. The majority of this management unit falls within the Cumberland Plateau ecoregion. The southwestern portion of the Bankhead National Forest is in the upper Gulf Coastal Plain.

The **Conecuh National Forest** contains almost 84,000 acres within Covington and Escambia Counties in south central Alabama. It is completely contained within the lower Gulf Coastal Plain, with land types including the Dougherty Plains, Pine Hills, Wet Pine Flatwoods, and the Conecuh & Yellow River Floodplains.

The **Oakmulgee Division of the Talladega National Forest** has over 157,000 acres, spreading across Hale, Bibb, Chilton, Perry, Dallas & Tuscaloosa Counties in west central Alabama. Located in the upper Gulf Coastal Plain, its northern section lies along the Alabama Fall Line, thus ensuring inclusions of Cumberland Plateau community associations.

The **Shoal Creek and Talladega Districts of the Talladega National Forest** contain the southernmost portion of the southern Appalachians, as well as a section of the Piedmont ecoregion. Situated in northeast Alabama, these two Districts span Cleburne, Calhoun, Talladega, Clay and Cherokee Counties, and encompass over 230,000 acres.

The **Tuskegee National Forest**, containing a little over 11,000 acres, lies within Macon County. It runs across the middle to upper Gulf Coastal Plain, making up a major portion of the Uphapee floodplain and the Tuskegee Hills land type associations.



Map 1 – Vicinity map for National Forests in Alabama lands by unit.

IV. METHOD OF SPECIES SELECTION AND ANALYSIS

Sensitive Species are species "identified by a Regional Forester for which population viability is a concern…" (FSM 2670.5(19)). The Regional Forester's list of Sensitive Species is periodically updated to reflect improved knowledge of species' status and to focus on those species most at risk. The most recent Sensitive Species list was issued August 7, 2001. All species on that list that occur or potentially occur on the National Forests in Alabama are evaluated in this document (Tables V.1, V.2, V.3).

V. SENSITIVE SPECIES – NATIONAL FORESTS IN ALABAMA

There are over 182 Regional Forester's Sensitive Species (RFSS) known or suspected to occur on or near one or more of the management units comprising the National Forests in Alabama (Tables V.1, V.2, V.3). Alternatively, see Attachment B, located at the back of the document.

V.1. Terrestrial Animals:

Scientific Name	Common Name	Management Unit of Consideration				
		BA	CO	OA	TA	TU
Corynorhinus rafinesquii	Rafinesque's big-eared bat	FP	FP	FP	FP	FP
Myotis austroriparius	Southeastern myotis		F1	FP		FP
Myotis leibii	Eastern small-footed bat				FP	
Ursus americanus floridanus	Florida black bear		FP			
Aimophila aestivalis	Bachman's sparrow		F2	F2	F2	F2
Falco peregrinus	Peregrine Falcon				F1	
Rana capito	Gopher frog		F1			
Gopherus polyphemus	Gopher tortoise		F2			
Pituophis melanoleucus mugitus	Florida pine snake		F3			
Ophisaurus mimicus	Mimic glass lizard		FP			
Speyeria diana	Diana fritillary	FP			F1	
Callophrys irus	Frosted elfin				FP	
FP= Forest Potential, F1= , F2= , F3= .						

V.2. Plants:

Scientific Name	Common Name	Management Unit of Consideration				
		BA	CO	OA	TA	TU
Aneura maxima (= A. sharpii)	A liverwort	X				
Cheilolejeunea evansii	A liverwort	X				
Nardia lescurii	A liverwort	X				
Pellia X appalachiana	A liverwort	X				
Plagiochila echinata	A liverwort	X			X	
Radula sullivantii	A liverwort	X				
Riccardia jugata	A liverwort	X				
Tetrodontium brownianum	Little Georgia moss				X	
Aesculus parviflora	Small-flowered buckeye	X		X	X	
Agalinis divaricata	Pinelands false foxglove		X			
Agrimonia incisa	Incised agrimony		X			
Andropogon arctatus	Pinewoods bluestem		X			
Arabis georgiana	Georgia rockcress			X		
Arnoglossum sulcatum	Indian plantain		X			
Asplenium X ebenoides	Scott's spleenwort	X				
Aster eryngiifolius	Thistleleaf aster		X			

Scientific Name	Common Name	Management Unit of Consideration				
		BA	CO	OA	TA	TU
Aster georgianus	Georgia aster				X	
Astragalus michauxii	Sandhills milkvetch		X			
Astragalus tennesseensis	Tennessee milkvetch	X				
Aureolaria patula	Spreading yellow false foxglove	X				
Baptisia megacarpa	Appalachian wild indigo		X	X		X
Botrichium jenmenii	Alabama grapefern				X	
Calopogon multiflorus	Many-flower grass pink		X			
Calopogon pallidus	Pale grasspink		X			
Carex brysonii	Bryson's sedge	X				
Carex decomposita	Cypress-knee sedge		X	X		
Carex impressinervia	Ravine sedge			X		
Castilleja sp. nov. "kraliana"	Kral's Indian paintbrush				X	
Coelorachis tuberculosa	Florida jointtail grass		X			
Colinsonia verticillata	Whorled horsebalm				X	
Croton alabamensis	Alabama croton			X		
Cypripedium kentuckiense	Southern Lady's slipper			X		
Delphinium alabamicum	Alabama larkspur	X				
Diervilla rivularis	Riverbank bush-honeysuckle	X				
Echinodorus parvulus	Mudbabies		X			
Fothergilla major	Large witchalder			X	X	
Helianthus longifolius	Longleaf sunflower			X	X	
Helianthus smithii	Smith sunflower				X	
Hexastylis shuttlesworthii var. *harperi*	Harper's wild ginger				X	
Hexastylis speciosa	Harper's heartleaf			X		
Hymenocallis caroliniana (=H. coronaria)	Carolina spider lily			X	X	
Hymenophyllum tayloriae	Taylor's filmy fern	X				
Jamesianthus alabamensis	Alabama jamesianthus	X		X	X	
Juglans cinerea	Butternut	X		X	X	
Lachnocaulon digynum	Pineland bogbutton		X			
Leavenworthia alabamica var. *alabamica*	Alabama gladecress	X				
Leavenworthia crassa	Fleshyfruit gladecress	X				
Lesquerella densipila	Duck River bladderpod	X				
Lilium iridollae	Panhandle lily		X			
Lindera subcoriacea	Bog spicebush		X			
Linum macrocarpum	Spring Hill flax		X			
Lysimachia fraseri	Fraser's yellow loosestrife				X	
Macranthera flammea	Flame flower		X			
Marshallia trinervia	Broadleaf Barbara's buttons				X	
Minuartia alabamensis	Alabama Sandwort	X			X	
Monotropsis odorata	Sweet Pinesap	X				

Scientific Name	Common Name	Management Unit of Consideration				
		BA	CO	OA	TA	TU
Myriophyllum laxum	Loose watermilfoil		X			
Neviusia alabamensis	Alabama snow-wreath	X		X	X	
Panicum nudicaule	Naked-stemmed panic grass		X			
Pieris phillyreifolia	Climbing fetterbush		X			
Pinguicula planifolia	Chapman's butterwort		X			
Pinguicula primuliflora	Southern butterwort		X			
Pityopsis oligantha	Coastal-Plain golden-aster		X			
Plantago sparsiflora	Pineland plantain		X			
Platanthera integra	Yellow fringeless orchid		X			
Platanthera integrilabia	White fringeless orchid	X		X	X	
Polygala hookeri	Hooker's milkwort		X			
Polymnia laevigata	Tennessee leafcup	X				
Quercus arkansana	Arkansas oak			X		
Rhexia salicifolia	Panhandle meadowbeauty		X			
Rhododendron austrinum	Orange azalea		X			
Rhynchospora crinipes	Hairy peduncled beakrush		X			
Rhynchospora macra	Large beakrush		X			
Rhynchospora pleiantha	Coastal beaksedge		X			
Rhynchospora thornei	Thorne's beaksedge		X	X		
Robinia viscosa	Clammy locust	X			X	
Rudbeckia auriculata	Eared coneflower			X	X	
Rudbeckia heliopsidis	Sunfacing coneflower					X
Rudbeckia triloba var. *pinnatiloba*	Pinnate-lobed black-eyed Susan				X	
Ruellia noctiflora	Night flowering ruellia		X			
Sabatia capitata	Appalachian rose gentian				X	
Sarracenia leucophylla	Crimson pitcherplant		X			
Sarracenia rubra ssp. *wherryi*	Wherry's pitcherplant		X			
Schisandra glabra	Bay starvine			X		
Scutellaria alabamensis	Alabama skullcap	X			X	
Sedum nevii	Nevius' stonecrop	X		X	X	
Silene ovata	Blue Ridge catchfly	X				
Silene regia	Royal catchfly			X		
Sporobolus curtisii	Pineland Dropseed		X			
Sporobolus floridanus	Florida dropseed		X			
Talinum calcaricum	Limestone fameflower	X				
Talinum mengesii	Menge's fameflower	X				
Tephrosia mohrii	Pineland hoarypea		X			
Thalictrum macrostylum (=T.subrotundum)	Piedmont meadowrue				X	
Thalictrum mirabile	Little Mountain meadowrue	X				
Thaspium pinnatifidum	Cutleaved meadow parsnip				X	
Tofieldia glabra	Smooth tofieldia		X			
Tridens carolinianus	Carolina fluffgrass		X			

Scientific Name	Common Name	Management Unit of Consideration				
		BA	CO	OA	TA	TU
Trillium lancifolium	Lanceleaf trillium	X		X	X	
Trillium rugelii	Southern nodding trillium				X	
Trillium simile	Jeweled trillium	X				
Xyris chapmanii	Chapman's yellow-eyed grass		X			
Xyris drummondii	Drummond's yelloweyed grass		X			
Xyris isoetifolia	Quillwort yelloweyed grass		X			
Xyris longisepala	Kral's yelloweyed grass		X			
Xyris louisianica	Louisiana yelloweyed grass		X			
Xyris scabrifolia	Harper's yelloweyed grass		X			

V.3. Aquatic Animals

Scientific Name	Common Name	Status[1]	Management Units[2]				
			BA	CO	OA	TA	TU
Necturus alabamensis	Black Warrior waterdog	SC	L				
Graptemys ernsti	Escambia map turtle	S		C			
Stenotherus minor	Loggerhead musk turtle	-	C			R	
Alosa alabamae	Alabama shad	SC		N	H		
Crystallaria asperella	Crystal darter	S		R	R		R
Etheostoma sp. Cf. bellator	Sipsey Warrior darter	S	R				
Etheostoma bifascia	Florida sand darter	S		C			
Etheostoma brevirostrum	Holiday darter	S				L	
Etheostoma davisoni	Choctawhatchee darter	S				C	
Etheostoma ditrema	Coldwater darter	S				R	
Etheostoma douglasi	Tuskaloosa darter	S	A				
Etheostoma parvapinne	Goldstripe darter	S	?	R	R		R
Etheostoma phytophyllum	Rush darter	S	R				
Etheostoma ramseyi	Alabama darter	S			C		
Etheostoma tuscumbia	Tuscumbia darter	S	D				
Etheostoma zonifer	Backwater darter	S			S		R
Hybopsis lineapunctata	Lined chub	S				R	
Notropis uranoscopus	Skygazer shiner	S			A		A
Noturus munitus	Frecklebelly madtom	S			R		
Percina austroperca	Southern logperch	S		R			
Percina brevicauda	Coal darter	S			R	P	
Percina lenticula	Freckled darter	S			R	P	S
Percina macrocephala	Longhead darter	S	H				
Percina palmaris	Bronze darter	S				R	
Cambarus englishi	A Crayfish	S				R	
Cambarus miltus	Rusty gravedigger crayfish	S		P			
Procambarus marthae	A crayfish	S		P	P		
Anodontoides radiatus	Rayed creekshell	S		H	L		L
Elliptio arca	Alabama spike	S	S			S	
Fusconaia succissa	Purple pigtoe	S		S			

Scientific Name	Common Name	Status[1]	Management Units[2]				
			BA	CO	OA	TA	TU
Lampsilis australis	Southern sandshell	S		R			
Lasmigona complanta alabamensis	Alabama heelsplitter	S			C		C
Lasmigona holstonia	Tennessee heelsplitter	S				L	
Margaritifera marrianae	Alabama pearlshell	SC		R			
Obovaria jacksoniana	Southern hickorynut	S	-	-	-	-	-
Obovaria unicolor	Alabama hickorynut	S			P		
Pleurobema hanleyianum	Georgia pigtoe	SC				H	
Pleurobema troshelianum	Alabama clubshell	C				H	
Ptychobranchus jonesi	Southern kidneyshell	S		N			
Quadrula rumphiana	Ridged mapleleaf	S			C	N	
Strophitus connasaugaensis	Alabama creekmussel	S			C	C	
Strophitus subvexus	Southern creekmussel	S		P			
Villosa choctawensis	Choctaw bean	S		R			
Villosa nebulosa	Alabama rainbow	S	U		U	U	
Villosa vanuxemensis umbrans	Coosa combshell (=creekshell)	S				R	
Cheumatopsyche bibbensis	A caddisfly	S			S		
Cheumatopsyche helma	Helma's net-spinning caddisfly	S				S	
Cordulegaster sayi	Say's spiketail	S		P			
Epitheca spinosa	Robust baskettail	S		R			
Gomphus geminatus	Twin-striped clubtail	S		R			
Gomphus hodgesi	Hodges' clubtail	S		S			
Gomphus hybridus	Cocoa clubtail	S		P	R		
Hydropsyche hageni	A caddisfly	S			N		
Hydroptila cheaha	A caddsfly	S				S	
Hydroptila choccolocco	A caddisfly	S				L	
Hydroptila paralatosa	A caddisfly	S			S		
Hydroptila patriciae	A caddisfly	S				P	
Hydroptila setigera	A caddisfly	S				S	
Neurocordulia molesta	Smokey showdragon	S					U
Oecetis morsei	Morse's Long-horn Sedge	S			P		
Ophiogomphus alleghaniensis	Alleghany snaketail	S			P	C	
Ophiogomphus incurvatus	Appalachian snaketail	S				P	
Polycentropus carlsoni	Carlson's Polycentropus caddisfly	S				S	
Progomphus bellei	Belle's sanddragon	S		S			
Rhyacophila carolae	A caddisfly	S	-	-	-	-	-
Somatochlora provocans	Treetop emerald dragonfly	S		U	U		
Stylurus laurae	Laura's clubtail	S			L		
Stylurus townesi	Townes' (bronze) clubtail	S		P			

[1] Status: E = endangered; T = threatened; P = proposed; C = candidate; S = sensitive (USFS, Southeast Region)
[2] Forest Units: Ba = Bankhead, Co = Conecuh, Oa = Oakmulgee, Ta – Talladega & Shoal Creek, Tu - Tuskegee
[3] Status: H = historical, P = potential, A = abundant, C = common, L = locally common, U = uncommon, R = rare, S = sparse, N = near, ? = unknown, - = not likely

VI. SPECIES EVALUATIONS AND DETERMINATIONS

In this section, each Sensitive Species is addressed individually in terms of 1) its status, distribution, and trend; 2) its habitat relationships and likely limiting factors; 3) potential effects of management; and 4) a determination of effect and supporting rationale.

Status, distribution, and trend information are based on a variety of sources that represent the best information currently available. It is expected that the quality of this information will be maintained or improved during Plan implementation, in compliance with FSM 2670.45(4), through inventory and monitoring programs.

Habitat relationships of Sensitive Species were defined during species viability evaluation for the EIS. Each terrestrial Sensitive Species was linked to habitat elements, and each aquatic Sensitive Species was linked to watersheds and key environmental factors. This biological evaluation is based on these habitat relationships. Risks from these habitat relationships are assessed, along with other non-habitat factors, to identify what are believed to be the most critical factors limiting populations.

The EIS includes analysis of management effects to habitats important to Sensitive Species. Each of the terrestrial habitat elements was analyzed for current and future distribution and abundance, the general likelihood that they would be limiting to associated species, and effects of management. Similarly, each watershed was analyzed for potential effects relative to key environmental factors. The details of these analyses are not repeated here, but results, as relevant to each Sensitive Species, are summarized in the narrative and in Attachments A and B. Overall effects to habitats are disclosed, as is the general likelihood that activities conducted as part of Plan implementation will directly impact individuals. The role of National Forest management activities in cumulative effects to the species is also addressed.

Determinations represent the overall expected effect of Plan implementation on each Sensitive Species. Unlike the viability evaluations in the EIS, which focus on risk from overall habitat outcomes across landscapes and watersheds, determinations in this document reflect the effect of National Forest management actions only. As a result, analysis from the EIS may indicate that many habitats are potentially limiting and resulting in risk to species in spite of positive effects of National Forest management. This situation is in most cases due to factors beyond the control of the agency, including the extensive modification of habitats across the larger landscapes within which the National Forest occurs, the infeasibility of quickly restoring all of the habitats on National Forest lands, and invasive and epidemic insects and diseases for which no effective controls exist. However, because ecological sustainability and species viability were one of the primary drivers used to define Plan goals, objectives, and standards, it is expected that Plan effects to most Sensitive Species will be beneficial.

VII. REGIONAL FORESTER'S SENSITIVE SPECIES

VII.A. SENSITIVE TERRESTRIAL ANIMALS

Introduction

Alabama's diversity of habitats is reflected in all the taxa represented in the state. There are eight federally listed terrestrial animals on the National Forests in Alabama (USFS 2003a). In addition to federally listed species, there are twelve species of terrestrial animals currently on the Regional Forester's sensitive species list (USFS 2002). Sensitive terrestrial animals include four mammal, two bird, one amphibian, three reptile and two insect species.

Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)

Distribution, Status, and Trend— This species is widespread over the southern states, but generally at low densities and in scattered locations; it is thought to be declining in many areas (NatureServe Explorer, 2003). This species has not been documented on any management unit of the National Forests in Alabama, despite numerous attempts to find it during documentation of federally listed bat fauna. In Alabama this species is state ranked as S2, *Imperiled*. For viability analysis it was given the ranking of FP, a potential resident of any of the management units on National Forests in Alabama.

Habitat Relationships and Limiting Factors—Viability evaluation indicates this species uses a variety of habitat components, roosting in caves, hollow trees, and other structures, and foraging over open water and in riparian areas (Attachment A). Caves and open wetlands are the habitat components most likely to be limiting due to their rarity on the landscape. Protection of roosts from disturbance is a primary need (NatureServe Explorer 2003).

Potential Management Effects— The revised Plan provides optimal protection and management for caves, wetlands, and lakeshores. All den trees are protected from cutting and are expected to increase in abundance over time. Distribution and abundance of late-successional riparian forests would be maintained. Additional standards protect known roost sites of this species. As a result, habitat conditions for this species are expected to improve as a result of plan implementation. Projects implemented in compliance with this plan present a discountable potential for direct impacts to individuals, because 1) known and potential roosting sites in caves and den trees are protected, 2) management activities in late-successional riparian forests will be limited, and 3) the likelihood of species occurrence in any project area is low. Cumulatively, many of these habitats on private lands are not likely to be maintained or managed favorably, making their presence on National Forest land increasingly important to this species.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because 1) protection measures for caves, den trees, and known roost sites are incorporated, 2) abundance and distribution of den trees and late-successional riparian forests are expected to improve or be maintained, and 3) potential for adversely impacting individuals is discountable. Negative effects to individuals are possible (though at immeasureable, insignificant, and discountable levels) however, overall long-term benefits are expected.

Southeastern bat (*Myotis austroriparius*)

Distribution, Status, and Trend— The Southeastern bat, a former C-2 Federal Candidate, is principally a southeastern species that ranges from coastal North Carolina west to eastern Texas and southeastern Oklahoma (Alabama Agricultural Experiment Station 1986). A large portion of the population apparently occurs in northern Florida in caves (NatureServe Explorer 2003). Apparently a 45-50 % decline occurred over the past 30-40 years with no sign of abatement. In Alabama, this species is state ranked as S2, *Imperiled*. The species is known from the southern edge of Alabama and is known to utilize a cave on Conecuh National Forest. For the viability analysis this species was ranked F1 on the Conecuh NF, and FP on the Oakmulgee and Tuskegee units.

Habitat Relationships and Limiting Factors—This species has high vulnerability to devastation by large scale disasters, such as a regional flood event affecting several caves or roost trees simultaneously. Viability evaluation indicates this species uses a variety of habitat components, roosting in caves, hollow trees, and other structures, and foraging over open water and in riparian areas (Attachment A). Caves and open wetlands are the habitat components most likely to be limiting due to their rarity on the landscape. Protection of roosts from disturbance is a primary need (NatureServe Explorer 2003).

Potential Management Effects— The revised Plan provides optimal protection and management for caves, wetlands, and lakeshores. All den trees are protected from cutting and are expected to increase in abundance over time. Distribution and abundance of late-successional riparian forests would be maintained. Habitat conditions for this species are expected to improve as a result of plan implementation. Projects implemented in compliance with this plan present a discountable potential for direct impacts to individuals, because 1) known and potential roosting sites in caves and den trees are protected, 2) management activities in late-successional riparian forests will be limited, and 3) the likelihood of species occurrence in any project area is low. Cumulatively, many of these habitats on private lands are not likely to be treated so favorably, making their presence on National Forest land increasingly important to this species.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because 1) protection measures for caves, den trees, and known roost sites are incorporated, 2) abundance and distribution of den trees and late-successional riparian forests are expected to improve or be maintained, and 3) potential for adversely impacting individuals is discountable. Negative effects to individuals are possible (though at immeasureable, insignificant, and discountable levels) however, overall long-term benefits are expected.

Eastern small-footed bat (*Myotis leibii*)

Distribution, Status, and Trend— This species is fairly widespread in southeastern Canada and eastern U.S., but very spotty in distribution and rarely found in large numbers

(NatureServe Explorer, 2003). In Alabama, the species' range includes the northernmost tier of counties, and the species is considered S1, or *Critically Imperiled*. This species has not been documented on any management unit of the National Forests in Alabama. For the viability analysis, it was ranked as FP on the Talladega Division, whose northernmost lands may reach the species' southern extent.

Habitat Relationships and Limiting Factors—Viability evaluation indicates this species uses a variety of habitat components, roosting in caves and mines, cliffs and rock fissures, and other structures, and foraging over open water and in riparian areas (Attachment A). Caves and open wetlands are the habitat components most likely to be limiting due to their rarity on the landscape. Protection of roosts from disturbance is a primary need (NatureServe Explorer 2003).

Potential Management Effects— The revised Plan provides optimal protection and management for caves, rock outcrops and cliffs, wetlands, and lakeshores. All den trees are protected from cutting and are expected to increase in abundance over time. Distribution and abundance of late-successional riparian forests would be maintained. Additional standards protect known roost sites of this species. As a result, habitat conditions for this species are expected to improve as a result of Plan implementation. Projects implemented in compliance with this plan present a discountable potential for direct impacts to individuals, because: 1) known and potential roosting sites in caves and den trees are protected, 2) management activities in late-successional riparian forests will be limited, and 3) the likelihood of species occurrence in any project area is low. Cumulatively, many of these habitats on private lands are not likely to be treated so favorably, making their presence on National Forest land increasingly important to this species.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because 1) protection measures for caves, den trees, and known roost sites are incorporated, 2) abundance and distribution of den trees and late-successional riparian forests are expected to improve or be maintained, and 3) potential for adversely impacting individuals is discountable. Negative effects to individuals are possible (though at immeasureable, insignificant, and discountable levels) however, overall long-term benefits are expected.

Florida black bear (*Ursus americanus floridanus*)

Distribution, Status, and Trend— The Florida black bear is a subspecies of the wide-ranging American black bear and occurs only in Florida and the coastal plain areas of Alabama and Georgia. The former candidate for federal listing was found in December of 1998 as not of merit for listing as endangered or threatened (U.S. Fish and Wildlife Service 1998). The Service's status review determined that the population was sustainable at the estimated level of 1600 to 3000 individuals covering much of the species' original range, and residing on secure habitat in four areas: Apalachicola National Forest, Okefenokee National Wildlife Refuge and Osceola National Forest, Ocala National Forest, and Big Cypress National Preserve. In Alabama, about 377 sq km support an estimated population of less than 50 bears in Covington and Mobile Counties. Alabama lists the species as a game species with no open season, and it is ranked as S2, *Imperiled*. Occasional transient males have been reported from the Conecuh National Forest, although no female bears with established home ranges occur in the Conecuh NF. However, the Conecuh National Forest, together with the Blackwater State Forest and Eglin Air Force Base in Florida, represent public lands available for natural expansion of black bear populations. For the viability analysis this species was ranked as FP on the Conecuh.

Habitat Relationships and Limiting Factors—Viability evaluation indicates this species uses a variety of habitat components, including canebrakes, mature mesic hardwood forests, hard mast, den trees, and remote areas (Attachment A). Intense forestry practices involving even-aged timber management over a large area (at the landscape scale) probably reduce habitat suitability for bears. Large-scale winter burning may reduce food resources by reducing blueberry, runner oak and other soft-mast-producing plants. Summer burning may encourage desirable plant species (NatureServe Explorer 2003).

Potential Management Effects— The revised Plan provides optimal protection and management for canebrakes. All den trees are protected from cutting and are expected to increase in abundance over time. Distribution and abundance of mature mesic hardwood forests would be maintained. Public conservation lands such as National Forests are considered desirable and remote from human activities (U.S. Fish and Wildlife Service 1998). Habitat conditions for this species are expected to improve as a result of Plan implementation through restoration of canebrakes, native communities, and native fire regimes. Projects implemented in compliance with this plan present a discountable potential for direct impacts to individuals, because 1) bears are very mobile and occupy large home ranges, and can move during temporary disturbance associated with silvicultural activity, 2) management activities in mature mesic hardwood forests will be limited, and 3) the likelihood of species occurrence in any project area is low. Cumulatively, many of these habitats on private lands are not likely to be treated so favorably, making their presence on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan is expected to have **beneficial effects** to this species because: 1) protection measures for canebrakes 2) abundance and distribution of den trees and mature mesic hardwood forests are expected to improve or be maintained, and 3) potential for adversely impacting individuals is discountable.

<u>Bachman's sparrow (*Aimophila aestivalis*)</u>

Distribution, Status, and Trend— Once a common inhabitant of southern pine forests, this species is now very local. In Alabama, the Bachman's sparrow is ranked as an S3, *Vulnerable*, and is a Priority Species (Partners in Flight 2001) in each of the physiographic regions containing National Forests in Alabama management units. The species is known from point counts and bird surveys on the Talladega and Oakmulgee Divisions of the Talladega National Forest, and the Tuskegee and Conecuh National Forests. For the viability analysis this species was ranked as F2.

Habitat Relationships and Limiting Factors— Viability evaluation indicates this species uses open pine woods with a thick ground cover of native grasses, maintained by frequent growing season fires. These habitats are generally in longleaf pine stands with low tree densities. Woodland or savanna structures are preferred over densely timbered forest stands (Attachment A). Open woodland and savanna conditions maintained by thinning and growing season fires are the habitat components most likely to be limiting due to their rarity on the landscape across the southeast. Restoration of longleaf pine and management of mature and old-growth pine stands, especially longleaf and shortleaf, by thinning and growing season burning is a primary need (NatureServe Explorer 2003).

Potential Management Effects— The revised Plan provides ample opportunity for the restoration of native ecosystems, including coastal and mountain longleaf pine ecosystems. Distribution and abundance of suitable restored woodlands and savannas should increase over existing levels through objectives in the revised Plan for prescribed burning and woodland and savanna restoration. Efforts to restore longleaf pine stands, and woodlands and savannas, as provided in the revised Plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. However, these birds evolved in an ecosystem in which fires (and other disturbance) occur within breeding seasons, and any short-term losses that may occur are more than compensated for by the long-term improvement of landscape level habitat conditions. Improved population health is more critical than the loss of a few individuals (Partners in Flight 2001). Cumulatively, these habitats are not usually maintained on private lands, making their presence on National Forest land increasingly important to this species.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Impacts to individuals are expected because the management actions that may cause mortality or habitat loss in the short-term must be implemented in order to produce long-term benefits to the species' population. Project-level analysis, conducted in compliance with agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability. Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because disturbance-dependent habitats will be restored, and adverse effects to individuals will be offset by greater benefit to the population.

Peregrine falcon (*Falco peregrinus anatum*)

Distribution, Status, and Trend— Peregrine falcons once ranged throughout much of North America from the subarctic boreal forests of Alaska and Canada, south to Mexico. In 1970 the peregrine falcon was listed as endangered under the Endangered Species Conservation Act of 1969, the predecessor of the current law, at a time when the population in the Eastern U.S. had completely disappeared and populations in the west had declined by as much as 80 to 90 percent below historical levels. Because peregrines had been eliminated from the east, the original listing did not include vestigial eastern populations. Thus peregrine falcons in the east were never federally listed. In any case, the ban of DDT allowed an unprecedented recovery of the species, which allowed the delisting of the species throughout its range in 1999. In Alabama the species is ranked as (SHB, S3N) a historic breeder in the state and as S3, *Vulnerable*, during the non-breeding season. Historic breeding range included Lauderdale, Limestone, Madison and Marshall Counties. These counties constitute the northernmost portion of the state. No National Forests in Alabama management units are within the historic breeding range. The Talladega Division, which includes the three highest points in Alabama, has potential nesting sites on the high cliffs ledges and rock outcrops that top those peaks. The peregrine falcon is not a Priority Species for the Southern Cumberland Plateau, the physiographic region within which the Talladega Division lays.

Habitat Relationships and Limiting Factors— Peregrine falcons prefer a tall cliff near water for nesting. Ideal locations include undisturbed areas with a wide view, near water, and close to plentiful prey (NatureServe Explorer 2003). Viability evaluation associates this species with Rock Outcrops and Remoteness (Attachment A). Tall cliffs and rock outcrops are most likely to be limiting due to their rarity on the landscape. Large parcels of public lands, such as National Forests, are already considered remote and desirable to wildlife, however, in the particular case of the Talladega Division, the two highest peaks in the state occur within Designated Wilderness Areas (Dugger and Cheaha), insuring an even greater Remoteness component. Protection of cliffs is a primary need.

Potential Management Effects— The revised Plan provides optimal protection and management for rock outcrops, cliffs, open wetlands, and lakeshores. Public conservation lands such as National Forests are considered desirable and remote from human activities (U.S. Fish and Wildlife Service 1998). Distribution and abundance of these resources would be maintained. As a result, habitat conditions for this species are expected to remain constant as a result of Plan implementation. Projects implemented in compliance with this plan present a discountable potential for direct impacts to individuals, because 1) potential nesting sites on rock outcrops and cliffs are protected, and 2) the likelihood of species occurrence in any project area is low. Cumulatively, many of these habitats on private lands are not likely to be treated so favorably, making their presence on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan is expected to have **beneficial effects** to this species because: 1) potential nesting sites on rock outcrops and cliffs are protected, and 2) the likelihood of species occurrence in any project area is extremely low and potential for adversely impacting individuals is discountable.

Gopher frog (*Rana capito*)

Distribution, Status, and Trend—This species occupies the coastal plain from the southern half of North Carolina to southern Florida, west to Alabama (NatureServe Explorer, 2003). In Alabama, this species is ranked as S2, *Imperiled*. Several breeding ponds have been found on the Conecuh National Forest since research and restoration management for the species began during the late 1980s. For the viability analysis, it was given a Forest Rank of F1, meaning it is very rare, with 1-5 known breeding pond locations.

Habitat Relationships and Limiting Factors—Viability evaluation indicates this species uses a variety of habitat components including (fishless) coastal plain ephemeral ponds for its larval stage, and longleaf pine woodlands and savannas and xeric sandhills where adults share the burrows of gopher tortoises (Attachment A). Both coastal plain ponds and xeric sandhill habitats are very limited on the landscape and most have already been lost to land use conversion, short-rotation pine management, and forest succession during periods of fire suppression (NatureServe Explorer 2003). Protection of coastal plain ponds, especially from introduction of predatory fish species, is necessary for species persistence.

Potential Management Effects— The revised Plan provides optimal protection and management for coastal plain ponds and xeric sandhill communities. Restoration management objectives for woodland and savanna structure in upland pine (especially longleaf pine) are included in the revised Plan. Distribution and abundance longleaf woodlands and savannas would be increased. Xeric sandhill community and coastal plain ponds locations are dictated by soil characteristics, but they too would be improved by restoration fire regimes prescribed in the revised Plan. As a result, habitat conditions for this species are expected to improve as a result of Plan implementation. Projects implemented in compliance with this plan present a discountable potential for direct impacts to individuals, because 1) known and potential breeding pond sites are protected, 2) management activities in wetland, riparian, and coastal plain pond margin areas will be limited, and 3) the likelihood of species occurrence in any project area is low. However, some risk remains during implementation of upland habitat improvements. Cumulatively, many of these habitats on private lands have been lost, and those suitable habitats remaining are not likely to be managed favorably, making their restoration and presence on National Forest land increasingly important to this species.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Impacts to individuals are expected because the management actions that may cause mortality or habitat loss in the short-term must be implemented in order to produce long-term benefits to the species' population. Project-level analysis, conducted in compliance with agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability. Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because disturbance-dependent habitats will be restored, and adverse effects to individuals will be offset by greater benefit to the population.

Gopher tortoise (*Gopherus polyphemus*)

Distribution, Status, and Trend—This species occupies the coastal plain from the southern half of South Carolina to southern Florida, west through southern Alabama, Mississippi and eastern Mississippi (NatureServe Explorer, 2003). In Alabama, this species is ranked as S3, *Vulnerable*. Gopher tortoises commonly occur in suitable habitats on the Conecuh National Forest where it was given a Forest Rank of F2.

Habitat Relationships and Limiting Factors—Viability evaluation indicates this species uses a variety of habitat components including longleaf pine woodlands and savannas and xeric sandhills where the tortoises build burrows in deep sandy soils (Attachment A). Land use conversion, development, and commercial forestry are the primary reasons for range-wide declines as forest stands in a woodland or savanna condition and sandhill habitats have been lost (NatureServe Explorer 2003). Restoration and protection of longleaf pine woodlands and savannas, and xeric sandhill communities are necessary for species persistence.

Potential Management Effects— The revised Plan provides optimal protection and management of xeric sandhill communities. Restoration management objectives for woodland and savanna structure in upland pine (especially longleaf pine) are included in the revised Plan. Distribution and abundance of longleaf woodlands and savannas would be increased. Xeric sandhill community distribution is dictated by locations of deep sands, but they too would be improved by restoration fire regimes prescribed in the revised Plan. As a result, habitat conditions for this species are expected to improve as a result of plan implementation. Burrows are located and avoided during management treatments; however, some risk of impacts to individuals remains. Cumulatively, many of these habitats on private lands have been lost, and those remaining are not likely to be managed favorably, making their presence and restoration on National Forest land increasingly important to this species.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Impacts to individuals are expected because the management actions that may cause mortality or habitat loss in the short-term must be implemented in order to produce long-term benefits to the species' population. Project-level analysis, conducted in compliance with agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability. Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because disturbance-dependent habitats will be restored, and adverse effects to individuals will be offset by greater benefit to the population.

Florida pine snake (*Pituophis melanoleucus mugitus*)

Distribution, Status, and Trend— This species is usually found in sandhill habitat where longleaf pine and scrub oaks are dominant and gopher tortoises and pocket gophers occur (Alabama Agricultural Experiment Station 1986). In Alabama, this species is ranked as S2, *Imperiled,* and may intergrade with the black pine snake on the Conecuh National Forest, the National Forests in Alabama management unit within the species' range. For the viability analysis this species was ranked as F3.

Habitat Relationships and Limiting Factors—Viability evaluation indicates this species uses a variety of habitat components including longleaf pine woodlands and savannas, xeric sandhills, and downed woody debris in remote areas where gopher tortoises and pocket gophers build burrows in deep sandy soils (Attachment A). Pine snakes feed on pocket gophers and use the burrows of pocket gophers and gopher tortoises for shelter. Public conservation lands such as National Forests are considered desirable and remote from human activities (U.S. Fish and Wildlife Service 1998). Land use conversion, development, and commercial forestry are the primary reasons for range-wide declines as forest stands in a woodland or savanna condition and sandhill habitats have been lost (NatureServe Explorer 2003). Restoration and protection of gopher tortoise and pocket gopher habitat in longleaf pine woodlands and savannas, and xeric sandhill communities are necessary for species persistence.

Potential Management Effects— The revised Plan provides optimal protection and management of xeric sandhill communities. Restoration management objectives for woodland and savanna structure in upland pine (especially longleaf pine) are included in the revised Plan. Distribution and abundance of longleaf woodlands and savannas would be increased. Xeric sandhill community distribution is dictated by locations of deep sands, but they too would be improved by restoration fire regimes prescribed in the revised Plan. This would result in improved habitat conditions for gopher tortoises and pocket gophers. As a result, habitat conditions for this species are expected to improve as a result of Plan implementation. Cumulatively, many of these habitats on private lands have been lost, and those remaining are not likely to be treated so favorably, making their presence and restoration on National Forest land increasingly important to this species.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Impacts to individuals are expected because the management actions that may cause mortality or habitat loss in the short-term must be implemented in order to produce long-term benefits to the species' population. Project-level analysis, conducted in compliance with agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability. Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because disturbance-dependent habitats will be restored, and adverse effects to individuals will offset by greater benefit to the population.

Mimic glass lizard (*Ophisaurus mimicus*)

Distribution, Status, and Trend— This species is found in the Atlantic and Gulf coastal plains, from southeastern North Carolina to northern Florida and westward through the Florida panhandle to Pearl River County, Mississippi. Glass lizards are fossorial and difficult to survey. Very little historical distribution or abundance information is available. Up to 5 extant sites with 50% in good condition and 50% in fair condition exist in Alabama. Populations are thought to be declining in Alabama, as preferred habitat has declined in the State. Therefore, this species is ranked as S2, *Imperiled*, by the state and FP, *Potential* on the Conecuh National Forest, the National Forests in Alabama management unit within the species' range.

Habitat Relationships and Limiting Factors—Viability evaluation indicates this species uses a variety of habitat components including longleaf pine woodlands and savannas, downed woody debris, and occasionally seepage bogs (Attachment A). Land use conversion, development, and road mortality are the primary reasons for range-wide declines (NatureServe Explorer 2003). Restoration and protection of longleaf pine woodlands and savannas is necessary for species persistence.

Potential Management Effects— The revised Plan provides optimal protection and management of seepage bog communities. Restoration management objectives for woodland and savanna structure in upland pine (especially longleaf pine) are included in the revised Plan. Distribution and abundance of longleaf woodlands and savannas would be increased. As a result, habitat conditions for this species are expected to improve as a result of Plan implementation. Cumulatively, many of these habitats on private lands have been lost, and those remaining are not likely to be treated so favorably, making their presence and restoration on National Forest land increasingly important to this species.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Impacts to individuals are expected because the management actions that may cause mortality or habitat loss in the short-term must be implemented in order to produce long-term benefits to the species' population. Project-level analysis, conducted in compliance with agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability. Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because disturbance-dependent habitats will be restored, and adverse effects to individuals will offset by greater benefit to the population.

Diana fritillary (*Speyeria diana*)

Distribution, Status, and Trend— This species has been found recently primarily in the mountains of central Virginia and West Virginia through the western Carolinas and eastern Tennessee into extreme northern Georgia and adjacent Alabama (NatureServe Explorer, 2003). This species is known to occur on the Talladega Division (F1) and has potential to occur on the Bankhead (FP). Occurrences are counted by the number of breeding demes. In Alabama this species is state ranked as S3, *Vulnerable*.

Habitat Relationships and Limiting Factors—Viability evaluation indicates this species uses a variety of habitat components including hardwood woodlands and mixed pine-hardwood woodlands and forests (Attachment A). Caterpillars of this species feed on plants of the genus *Viola*; however, females lay eggs seemingly at random among grasses. Adults feed on nectar-producing flowers in meadows, glades, and woodlands. Populations of these butterflies are thought to be fragile, and likely to die out in heavily forested areas. Provision of varied habitats with woodland and savanna components is a primary need (NatureServe Explorer 2003).

Potential Management Effects— Glades would receive optimum protection and restoration under the revised Plan. Distribution, abundance, and quality of upland woodland and savanna habitats would be improved under the revised Plan. As a result, habitat conditions for this species are expected to improve as a result of Plan implementation. Some risk of impacts to individuals exists under woodland and savanna restoration objectives. However, cumulatively, many of these habitats on private lands are not likely to be treated so favorably, making their presence on National Forest land increasingly important to this species, and overall beneficial to populations.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Impacts to individuals are expected because the management actions that may cause mortality or habitat loss in the short-term must be implemented in order to produce long-term benefits to the species' population. Project-level analysis, conducted in compliance with agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability.

Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because disturbance-dependent habitats will be restored, and adverse effects to individuals will offset by greater benefit to the population.

Frosted elfin (*Callophrys irus*)

Distribution, Status, and Trend— Southern populations of this species are referred to as *Baptisia* feeders, meaning they feed chiefly on plants of the *Baptisia* genus (NatureServe Explorer, 2003). This species may occur in Alabama, and if it does, is most-likely to occur on the Talladega Division. In Alabama this species is state ranked as SU, *Unrankable* and FP for the viability analysis.

Habitat Relationships and Limiting Factors—Viability evaluation indicates this species uses a variety of habitat components including early–successional forests and woodlands, and savannas (Attachment A). Little is known about the role of fire in the ecology of this species, but its pupae are not in the soil and are thought to be exposed to fires. However, this species also apparently prefers flowers of several genera of Ericaceae, which are often fire associates (NatureServe Explorer 2003).

Potential Management Effects—Distribution and abundance of early-successional forests and woodland and savanna habitats would be adequate under the revised Plan. Some risk of impacts to individuals exists under woodland and savanna restoration objectives. However, cumulatively, many of these habitats on private lands are not likely to be treated so favorably, making their presence on National Forest land increasingly important to this species, and overall beneficial to populations.

Determination and Rationale— Implementation of the Forest Plan **may impact individuals, but is not likely to cause a trend toward listing or loss of viability**. Impacts to individuals are expected because the management actions that may cause mortality or habitat loss in the short-term must be implemented in order to produce long-term benefits to the species' population. Project-level analysis, conducted in compliance with agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability. Overall, implementation of the Plan is expected to have beneficial effects to the preferred habitat of this species because disturbance-dependent habitats will be restored, and adverse effects to individuals will offset by greater benefit to the population.

VII.B. SENSITIVE PLANTS

Introduction

The National Forests in Alabama have well over 100 sensitive plant species, 4 candidate plant species and numerous locally rare species on or near national forest lands. This NFAL total is nearly one-half of all the state tracked species listed in Alabama, and in spite of the small land-base, with the National Forests in Alabama occupying less than 3% of the total land base in Alabama. This places the National Forests in Alabama as a critical refugium for many habitats and sensitive and locally rare species throughout Alabama.

All of the species listed above are rare throughout their range. The tracking of these species is primarily a result of their apparent limited distribution and the fragile nature of the habitats upon which they depend. Suitable habitat has been found to occur on National Forests in Alabama lands, and is occupied by these sensitive and locally rare species. Habitat loss through land conversion and development remain the principle reasons cited by all sources as contributing to a trend toward listing or keeping these species federally listed. Additional impacts include modification of habitat, loss of fire, changes in hydrological function, changes in landform, building of dams, invasion of non-native plant species and over-collection or poaching from wild populations.

Broadcast herbicide (including boom spraying and backpack spraying) is detrimental to all these sensitive and locally rare plant species (Kral, pers comm 2002) specifically because most herbicides target broad-leaved herbaceous species. Mechanical soil disturbance, compaction, rutting and activities that could alter the hydrology or landform of the population sites, habitat or potential suitable sites should be avoided. State highway and powerline rights-of-way are often vulnerable to herbicide spraying or other roadside maintenance activities, drought, and competition with successional vegetation or invasive non-native species.

Based on several of the plants dependence on wetland habitat these species could be positively managed by protecting sites from encroachment by woody shrub species leaving a partial (or thinned) overstory canopy in place and ensuring that activities taking place in areas where the plant occurs do not adversely affect the hydrology of the site (Moffett, 2002). Management options would include hand removal of woody midstory/shrub encroachment, thinning based on site-specific recommendations and mitigation, and burning. Total canopy removal is not recommended for most species (Moffett 2002). In cases where National Forest lands lie downstream from known federally listed plant populations, suitable habitat sites need to be monitored to survey for new colonies.

Many of these sensitive, candidate and locally rare species occur within rare communities. Several standards for rare communities will ensure their maintenance and restoration across the landscape. Rare communities would be protected from detrimental effects caused by management actions across all alternatives. Rare communities would be inventoried in proposed project areas when projects are being proposed which have the potential to adversely affect them. Because of these standards, most regional forester sensitive and locally rare species will fall under protection and restoration mandates. Additionally, Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected.

Summary of impacts

The combination of prescription allocations, forest-wide standards, and site specific mitigations described above afford very good protection to the Regional Forester's sensitive species and locally rare species populations and habitats from potential negative effects due to forest management activities. Despite this, some species may have some inherent biological limitations that could continue to pose risks to long-term viability, especially at sites where population numbers are low. Based upon this, it is apparent that while Forest Service conservation actions may contribute to improve rangewide viability, they cannot, in all cases, maintain it.

Under the Plan, the integrity of these sites will be protected in all alternatives by adherence to the standards listed in the rare community (9F), canyon corridor (4F) and riparian (11) prescriptions. In some cases, such as restoration efforts or reintroduction of species, the National Forests in Alabama can play a positive role in recovery and are expected to result in positive impacts.

Therefore, under Alternative I, the current Forest Service Manual and Handbook regulations will continue to ensure that habitat and populations of Regional Forester sensitive species, federal candidate and locally rare species will be protected and conserved.

As previously stated, the National Forests in Alabama will continue to play a critical role as refugia for federally threatened and endangered species. Inherent biological limitations based upon population dynamics may continue to pose risks to the species long-term viability, especially at small sites. Potential impacts to individuals remain at all sites through plant poaching. As conversion and habitat modifications continue on private lands, it is to be expected that more species and critical habitat will be lost. For example, out of 27 quality wetlands documented by Dr. Robert Kral in Alabama 20 years ago, only 3 currently exist in any shape or form (Kral, 2002). This trend is not expected to change over the next 50 years. As a result, the role for protection and restoration of these sensitive and locally rare species on the National Forests in Alabama will continue to become more critical over time. Surveys are will continue to be conducted to inventory for federally listed and candidate species and suitable habitat, and monitoring of known sites will continue.

Because rare plants often receive little or no protection on private land, and are often not well inventoried, public land plays a critical role in their conservation. . Cumulatively, therefore, persistence of these species in the area of the national forest, as well as across their ranges, will be greatly enhanced from efforts on the national forest to maintain, manage and expand populations.

VII. B. 1 **Habitat**

For the purposes of this document, only sensitive and candidate species are directly addressed by species. However, there are innumerable locally rare species or species of concern, whether due to rarity on the landscape, loss of habitat or poaching of the species for horticultural or medicinal uses. This locally rare list for the forests is based on coordination with numerous state and non-government agencies, as well as species occurrences on the forests. As such it is constantly being updated, based on the most current information. To account for those locally rare species, the habitat that is most commonly associated with them will be briefly evaluated in this section.

Bogs, Fens, Seeps, Seasonal Ponds

Distribution, Status and Trend
Flatwood bogs, hillside bogs and seepage bogs are extremely dependent on the hydrological forces and flows present in the area. They have water tables close to the surface, or are directly dependent upon the flow of water from the relatively higher upland areas (recharge areas). The moist conditions are maintained by seepage or overland water flow (MacRoberts, 1993). The soils consist of organic surface layers and acidic sandy or organic soils. There may or may not be an underlying concave lens of clay (National Wetlands Research Lab, unpublished). There has been an unprecedented loss of habitat of over 90% in the Coastal Plains alone (MacRoberts, 1998). These habitat types are rare on the landscape.

Habitat relationships and limiting factors
These systems were assigned a high likelihood of being a limiting factor in viability based on the highly restricted distribution and low relative abundance. The habitat is fairly well distributed within the planning area, but the number and size of high quality habitat patches is greatly reduced.

Potential Management Effects
Restoration and maintenance of these communities requires active and frequent management, including frequent or growing-season prescribed fire, hand removal of shrub or overstory, and thinning or mid-story control. Currently, these community types are becoming less common on the landscape. Although fire should be a primary tool used in restoration and maintenance of these communities, this is sometimes limited by smoke management, fuel loading, proximity to private lands or state highways or other critical considerations. A full range of additional restoration methods should be considered, including the restriction of mechanical access to the dry season, the use of vehicles equipped with low-psi, smooth rubber tires and other prescription-level mitigative methods associated with site-specific recommendations. Because of the extremely specific conditions of soils and hydrology that these need to persist, the management which is applied needs to be site-specific to provide optimal protection, maintenance and/or restoration.

Determination and Rationale
Because all alternatives place priority on protection and maintenance of these communities, cumulative effects on national forest lands are expected to be positive. However, a significant proportion of Southern Appalachian wetland rare communities are located on private lands (SAMAB 1996: 190) where protection may be poorly regulated. For these reasons, protection and/or maintenance of these habitats on national forest land is important to maintaining viability of associated species within the region.

Open Wetlands

Distribution, Status and Trend

Dominant vegetation may be herbs, shrubs, trees, or some complex of the three. Ponds in this group include limesink, karst, and depression ponds, which may hold areas of shallow open water for significant portions of the year. Also included are all impoundments and associated wetlands resulting from beaver activity. These are recognized as being rare on the landscape, encompassing less than 1% of the land base.

Habitat relationships and limiting factors
The wetter sites are seasonally inundated or saturated for 100-150 days per year (FNAI and FDNR, 1990). They usually occur in low, relatively flat, poorly drained terrain, sinkhole regions, or remnant oxbows and bayous. Soils typically consist of sands mixed with a high clay or organic component. This habitat has a moderate to high likelihood of expressing limitations to associated species based on it’s abundance and distribution throughout the landscape, primarily due to the requirements of soil, hydrology and the availability of an intact landscape in order to form and maintain open wetlands.

Potential Management Effects
These sites are extremely vulnerable to soil compaction, soil disturbance, rutting, depredation by feral hogs, and any other activity that disrupts the hydrology, especially during the wet season. Protection of these areas needs to be strongest during the wet season. The abundance and distribution may be maintained or improved through purposeful restoration. However, in some cases the opportunity to decrease the risk to associated species may not exist, dependent on condition and landscape community.

Determination and Rationale
Wetland communities are an integral portion of the landscape and may be found embedded throughout the coastal plain longleaf pine association. In many cases, the lands administered by the privately funded conservation groups, state and federal agencies serve as a refuge for natural rare plant communities and species that have been largely eliminated from private lands by extensive anthropogenic disturbance.
Planned levels of maintenance and restoration activities on National Forest lands will influence the future abundance of coastal plain wetland communities, and are expected to provide beneficial effects under the preferred alternative.

River Channels

Distribution, Status and Trend
These riverine rare communities are characterized by 1) sites adjacent to or within stream channels that are exposed to periodic flooding and scour, and 2) presence of significant populations or associations of species at risk. These communities may be found in both Appalachian and Piedmont regions as well as the Coastal Plain. These include river scour, gravel and sand bars as well as the channel itself. This habitat element is categorized as rare, with less than 100 occurrences throughout the planning area.

Habitat relationships and limiting factors
The primary management need is that of protection from activities that could disrupt wetland hydrology or other community structures and functions. Some sites may require periodic

vegetation management to maintain desired herbaceous and/or shrubby composition, especially if the associated species require a type of canopy opening or mid-river channel openings. This habitat is ranked as a high likelihood that it's restricted abundance and distribution could play a limiting role in the viability of an associated species.

Potential Management Effects
This habitat is maintained or improved by providing optimal protection, maintenance, and restoration to all occurrences. Primary management needs are protection from disturbance during development of road crossings, and maintenance of desirable in-stream flows. Wetland rare communities would be protected and maintained.

Determination and Rationale
Alternative I places priority on protection and maintenance of these communities. However, a significant proportion of Southern Appalachian wetland rare communities are located on private lands (SAMAB 1996: 190) where protection may be poorly regulated. For these reasons, protection of these habitats on national forest land is important to maintaining viability of associated species within the region. This habitat is expected to continue to be maintained under the preferred alternative.

Glades and Barrens

Distribution, Status and Trend
Glades and barrens are characterized by thin soils and exposed parent material that result in localized complexes of bare soils and rock, herbaceous and/or shrubby vegetation, and thin, often stunted woods. At a minimum, this rare community complex includes even rarer plant associations including but not limited to Limestone or dolomite woodlands and glades, serpentine woodlands and glades, shale glades and barrens, mafic glades and barrens, grassy pine glades and prairies. At the current time, it is estimated that these conditions exist on less than 1% of the National Forests in Alabama, although the sites that do occur tend to be very well distributed and embedded in several ecosystems.

These communities may be found in the Appalachian, Cumberland Plateau and Piedmont regions on the Bankhead, Oakmulgee, Shoal Creek and Talladega units. Limestone or dolomite, and sandstone glades and barrens occur primarily in the Ridge and Valley physiographic provinces ranging from Northern Alabama to Kentucky. Good examples are few and very restricted in distribution. Shale and mafic woodlands are more widespread in distribution, and may be forested if fire has not played a role in their maintenance or restoration. Most occurrences for mafic associations are from the Piedmont, but may occur as high as 2800 feet in elevation.

Habitat relationships and limiting factors
Numbers of species of concern associated with glades, barrens, and associated woodlands include approximately 17 species on the Piedmont and 110 species in the Southern Appalachian/Cumberland Plateau. The majority are vascular plants (88% and 91% in Piedmont and Southern Appalachian/Cumberland plateau, respectively) followed by insects

and reptiles.   There is a moderate probability that this habitat type is inherently limiting to the viability of associated species based on it's rarity on the landscape.

Potential Management Effects
To achieve desired composition and structure within these communities, many will require active restoration, such as basal area reduction, woody understory and mid-story control, or prescribed fire. Prescribed fire will often be needed to maintain these communities once restored. However, even though the number of habitat sites cannot be increased overall, thru the use of fire the improvement and restoration of current existing sites in various conditions can be greatly enhanced.

Determination and Rationale
Although the glade and barren communities are naturally restricted in distribution by soil conditions, under the rare community prescription all occurrences would be managed for restoration and maintenance of their characteristics. This emphasis is expected to result within 50 years in a relative abundance and distribution of this community on the National Forests in Alabama similar to that which occurred historically. However, since the majority of the best glades and woodlands occur on either private lands or lands administered by other agencies, any occurrences may be crucial to the recovery and maintenance of these rare community types.

Basic Mesic forests

Distribution, Status and Trend
These communities are characterized by closed-canopy deciduous overstories and rich and diverse understories of calciphilic herbs, underlain by high-base geologic substrates. On lower elevation sites, these communities are more typically found on north and east facing slopes. Basic mesic forest communities are found in both the Appalachian and Piedmont regions. These communities, although rare on the landscape, are very well distributed throughout the planning area.

Habitat relationships and limiting factors
The Southern Appalachian Assessment (SAMAB 1996:49) combined mesic and xeric mafic communities, and concluded that only 25% of the known occurrences for species associated with mafic and other calcareous habitats, occurred on National Forest land. Several species of viability concern are associated with basic mesic forests, with the majority being vascular plants. This habitat has a moderate likelihood of posing limitations on the associated species especially since this community will remain relatively rare on the forest because of its naturally limited distribution.

Potential Management Effects
All high quality basic mesic forest communities will be managed under the 9F (rare community) prescription under all alternatives. Primary management needs are protection from undesirable disturbance. These communities are characterized by low intensity, low frequency disturbances, and are often most threatened by recreational use, since many are

desirable for interpretive trails. Several standards for rare communities ensure their maintenance or restoration across the Forest. The 9F prescription encourages the exclusion of basic mesic forests from prescribed burning blocks where this can be accomplished without large increases in fireline construction, and discourages direct firing unless necessary to secure control lines. Only low intensity fires are allowed. Although the abundance and distribution of this habitat element is strictly limited by available soils and hydrological conditions, alternative I will provide optimal protection and potential maintenance opportunities.

Determination and Rationale
Based on regional conditions reported in SAMAB (1996: 49) the National Forests in Alabama likely contains a relatively small proportion of known occurrences of this community type; examples of the type on private lands are unlikely to receive the same level of protection. It is expected that the cumulative effects of development, recreational use, timber harvest, and other activities on private lands will result in a decrease of good examples of these community types across the landscape, making national forest examples increasingly valuable to regional conservation.

Rock Outcrops and Cliffs

Distribution, Status and Trend
Rock outcrop communities are characterized by significant areas of exposed, usually smooth, exfoliating granite, sandstone or calcareous rocks, with scattered vegetation mats and abundant lichens. These communities are found in both the Appalachian, Cumberland Plateau and Piedmont regions and include the Bankhead, Oakmulgee, Shoal Creek and Talladega. This community includes sandstone, granite and limestone outcrops.

The low-elevation forested boulderfield community is characterized by rock fields, found below 3,500 feet elevation, that support a variable density of trees, typically dominated by a mixed pine (Pinus palustris, P. echinata and P. virginiana) and Oak/Hickory overstory. The understory is often composed of currant and Rockcap fern. It also may contain a rich bryophyte community. A new type-location of low elevation boulderfield was recently discovered and described on the Talladega/Shoal Creek analysis area in 2002 (Majors, 2002). These are distinguished from talus slopes by the presence of trees. It is found in the Appalachian region, on the Talladega and Shoal Creek units.

These communities are very rare on the landscape (in the case of the low-elevational boulderfield, less than 5 occurrences have been documented). They do tend to be poorly distributed (clumped) across the landscape, although the number of high quality patches is still similar to reference conditions.

Habitat relationships and limiting factors
Rock outcrop and cliff communities are considered rare communities and will be managed optimally for protection, restoration, and/or maintenance through the 9F (rare community) prescription. This direction is the same under all plan alternatives thus

the effects of National Forest management on these communities and associated species is expected to be positive. This habitat type will remain rare and poorly distributed on National Forest lands however, due to it's naturally limited distribution. Viability of associated species will remain at risk, though management strategies will minimize this risk by maintaining or restoring existing sites and associated populations.

Potential Management Effects
As stated above, rock outcrop and cliff communities are considered rare communities and will be managed optimally for protection, restoration, and/or maintenance through the 9F (rare community) prescription. There will be limited opportunity to decrease any viability risks to associated species in these habitats, due to the fact of the limitation in abundance, wide spacing on the landscape, and the fact that many of these require protection rather than active management.

Determination and Rationale
These communities are vulnerable to negative impacts on private lands, making National Forest sites critical to maintain. Overall, the protection afforded by the rare community and canyon prescriptions will provide a highly effective buffer as well as guidelines for maintenance and protection. As mitigation and protection above these communities is maintained, the sites on National Forest lands should remain intact. The effect of National Forest management and protection on these communities and associated species is expected to be positive.

Spray Cliffs

Distribution, Status and Trend
Cliff and bluff communities are characterized by steep, rocky, sparsely-vegetated slopes, usually above streams or rivers. Spray cliff communities may be seasonally dry, but are normally predominantly wet, and include communities associated with waterfalls, such as spray cliffs and rock houses. These communities are found in the Appalachian and Cumberland plateau regions, including the Bankhead, Shoal Creek, and Talladega. These have also been found along the Cahaba directly north of the Oakmulgee. These are very rare throughout the planning area, but those that exist seem to occur in the same abundance relative to conditions present prior to European settlement.

Habitat relationships and limiting factors
Spray cliff communities are considered rare communities and will be managed optimally for protection, restoration, and/or maintenance through the 9F (rare community) prescription and the canyon prescription. A subset of these communities that are associated with riparian areas (spray cliffs, waterfalls, etc.) are also afforded protection by the riparian prescription. This habitat type will remain rare and poorly distributed on National Forest lands however, due to it's naturally limited distribution. Viability of associated species will remain at risk, though management strategies will minimize this risk by maintaining existing sites and associated populations.

Potential Management Effects

Spray cliff communities are considered rare communities and will be managed optimally for protection, restoration, and/or maintenance through the 9F (rare community) prescription. However, this habitat type will remain rare and poorly distributed on National Forest lands due to its naturally limited distribution.

Determination and Rationale
These communities are vulnerable to negative impacts on private lands, making National Forest sites critical to maintain. Overall, the protection afforded by three overlapping prescriptions will provide a highly effective buffer as well as guidelines for maintenance and protection. As mitigation and protection above these communities is maintained, the sites on National Forest lands should remain intact. The effect of National Forest management and protection on these communities and associated species is expected to be positive.

Canebrakes

Distribution, Status and Trend
Although at the time of European settlement, canebrakes were common in the Southeast, they rapidly disappeared following settlement due to factors such as overgrazing, clearing of land for farming, altered burning regimes, and changes in floodplain hydrology (Brantley and Pratt, 2001). Large canebrakes are extremely rare today and poorly distributed, and therefore it is critical to maintain these communities where they occur on Forest Service land.

Canebrakes are characterized by almost monotypic stands of giant or switch cane (*Arundinaria gigantea or A. tecta*), usually with no or low densities of overstory tree canopy. They are typically found in bottomlands or stream terraces. Although cane is found commonly as an understory component on these sites, provisions of the Rare Community Prescription apply only to larger patches (generally greater than 0.25 acres) exhibiting high densities that result in nearly monotypic conditions, or to areas selected for restoration of such conditions. This community is found in the Appalachian, Piedmont, and Coastal Plain regions, and occurs on all units in Alabama.

Habitat relationships and limiting factors
Analysis indicates that these rare canebrake communities will remain rare on the forest because of their naturally limited distributions. Therefore, viability of species that require these habitats would remain at some risk, although management strategies are expected to minimize this risk by maintaining existing sites and associated populations.

Potential Management Effects
Primary management needs are restoration and maintenance through overstory reduction and periodic prescribed fire. Management activities would be conducted to restore and maintain the canebrakes. These management options would include prescribed burning to control competing herbaceous and woody vegetation and restore culm vigor, and overstory and midstory removal to restore declining stands of cane.

Determination and Rationale

Plan management direction is to protect, restore, and maintain occurrences of canebrakes. Standards and guidelines for canebrake communities will be followed. Because priority is put on these communities, effects of national forest management on them and the associated species listed above is expected to be beneficial under alternative I.

Baygalls and Bayheads

Distribution, Status and Trend
The baygalls and bayheads take their name from the prevalence of bay trees (sweetbay and redbay) and gallberry. These can occur at the heads of drainage areas, where the water is funneled into restricted areas. They have been observed directly below steep hillside seeps. Some are associated lineally along small permanent watercourses while others occupy large depressed areas. Baygalls tend to support a mixture of mesophytic and hydrophytic trees and shrubs and remain moist even during the dry seasons of the year (Mount 1980). Standing water occurs in places during the wet seasons, but bays are considered terrestrial habitat. The understory vegetation is frequently thick and accessibility difficult.

Coastal plain baygalls and bayheads can be distinguished from surrounding forests and woodlands by a decrease in elevation, an increase in shrub density, a change in overstory composition to predominately bays, and the presence of water, inundated soils, and moist conditions even during dry periods. These are listed as occurring in less than 1% of the landscape across Alabama, but with fairly even distribution throughout. Occurrences are typically small in size ranging up to ten acres.

Habitat relationships and limiting factors
Many of the impacts which may be analyzed deal with hydrology and hydrological changes which may or may not occur due to management, or in cases, lack of management or restoration. Secondarily, the structure, composition and function of the areas impact the hydrology, which in turn, may further impact the structure and function of the system. This habitat has a moderate likelihood that it will be somewhat limiting to the associated species. It is present throughout the coastal plain, but the high quality habitat patches may be somewhat reduced.

Potential Management Effects
Alternatives that emphasize high densities of trees or minimal human intervention would be the most beneficial to the baygalls communities. This system is often in a state of flux or transition, being a highly dynamic system. The current management is at or near optimal at this point in time, and would be maintained under the proposed alternative

Determination and Rationale
It is expected that continued protection and restoration of these communities, as emphasized in the rare community prescription will continue to ensure the presence and full functionality of these rare community types.

Coastal Plain Ponds and Swamps

Distribution, Status and Trend
Coastal plain ponds, flatwoods depressions and sinkholes occur as imbedded features, usually found in pine flatwoods, in the southeastern coastal plains. They are influenced by drainage changes affected by impermeable clay lenses, slight depressions, peat accumulations, or limestone karst weathering. Surrounding higher terrain is underlain by deep sand, causing these ponds to be fed almost entirely by groundwater. These drainage changes cause seasonal, periodic, or permanent inundation. When dry, or reduced in size due to seasonal drought, these communities are subject to fires spreading from adjacent uplands. Winter fires are unlikely to burn these communities, except during extreme drought cycles. Surrounding vegetation and hydrology vary widely depending on the depth of the impermeable clay lens and the size of the watershed influencing the pond. Vegetation conditions range from cypress and gum ponds, to shrub-dominated swamps or bays, to continuous herbaceous flats or depressions. These are incredibly rare communities, and only fairly well distributed across the landscape. The number and size of habitat patches are reduced from reference conditions.

Habitat relationships and limiting factors
A full range of additional restoration methods should be considered, including the restriction of mechanical access to the dry season, the use of vehicles equipped with low-psi, smooth rubber tires and other prescription-level mitigative methods associated with site-specific recommendations. Fires should be allowed to burn across or into these sites, discouraging the use of plow or dozer lines. This habitat element is fairly distributed across the coastal plain, but has a moderate likelihood of exhibiting limitations on associated species due to the site-specific requirements of the habitat itself.

Potential Management Effects
Maintenance and restoration of these habitat types are highly management-dependent. Emphasizing high densities of trees or minimal human intervention would be the most beneficial to the Atlantic white cedar, baygalls, and swamp communities. Often, in these coastal plain wetland community types, fire is used as a primary restoration or maintenance tool. Sometimes, the fires may merely burn the dry standing material at the water's edge and across the water's surface if continuous fuel is available. In other cases, the fire may reach permanent standing water and fail to enter the main body of the wetland community, which remains green and full of moisture. If fires do penetrate, as may happen during a dry season or period of drought, these areas are only opened up temporarily, often to be replaced with regenerated shrubs and herb bogs. There is little additional opportunity to decrease the risk to associated species by management of these habitats except through land acquisition or protection of current examples on public lands.

Determination and Rationale
It is expected that continued protection and restoration of these communities, as emphasized in the rare community prescription would continue to ensure the presence and full functionality of these rare community types.

Sandhills

Distribution, Status and Trend
Embedded within the landscape of the upland coastal plain pine, are the xeric oak sandhills, also called deep sandylands or simply sandhill communities. This habitat type, a fire subclimax, is characterized by a dominance of sand post oak, blackjack oak, bluejack oak and turkey oak, with a scattering of longleaf pine (Mount, 1980). Understory components include dwarf post oak, haws and persimmon. Ground cover includes a little bluestem and wiregrass, soft greeneyes, reindeer lichen and a variety of legumes (most conspicuous being Baptisia spp and Lupinus spp.). This habitat type develops in areas having deep sandy soil caps – where elevations are sufficient to prevent the water table from approaching the surface.

This community type is known to occur in the East Gulf Coastal Plain with between 1% and 10% occurrence across the ecosystem, where it is restricted to extremely deep sandy soils. It is distinctive for its lack of wiregrass due to the extreme edaphic conditions. This sandhill association is widespread on Lakeland soils. Single longleaf pines maintain a sentinel status above the main canopy. The understory of scrub oaks, mainly turkey oak, bluejack oak, sand live oak and sand post oak, is highly variable, from shrubs to small trees (depending on interval, season, and pattern of fire), and from very sparse to very dense.

Habitat relationships and limiting factors
Sandylands, as an embedded community in the upland longleaf pine ecosystem used to be more commonly distributed throughout the coastal plain. In many cases, the lands administered by the privately funded conservation groups, state and federal agencies serve as a refuge for the last remaining coastal plain longleaf pine associations, with their attendant natural rare plant communities and species. The upland longleaf pine ecosystem with associated communities that remain encompass less than 1 percent of their historical occurrence, especially on private lands, largely due to development and other extensive anthropogenic disturbance. There is, however, only a moderate probability that this habitat will exhibit limiting factors on the viability of associated plant species, especially where management can actually play upon the inherent dynamics present in these communities.

Potential Management Effects
Xeric oak sandylands, as a whole, are dependent on dormant, growing and lightning season fires to retain their structurally open aspect and high species diversity. Without fire, the communities associated with pine savannahs are subject to hardwood encroachment and conversion to another community type. As fire-maintained communities, pine savannahs burn naturally, on a one to five year interval. It should be noted that the xeric sandylands and upland pine communities, as an inherent condition of their placement in the landscape, often serve, hydrologically, as the recharge area for the lower elevation, wetter sites, including bogs, ponds, and bayhead/pocosin areas. Management has a good chance of providing optimal maintenance and restoration to this habitat type, based upon natural occurrences.

Determination and Rationale
Planned levels of maintenance and restoration activities on National Forest lands will influence the future abundance of coastal plain upland communities. The ability to meet the activity levels requiring thinning, burning and/or restoration methods will be met in alternative I. These upland coastal plain habitats will continue to reflect the trend set forth in under the direct

effects section, with great benefits arising from the restoration and management activities under Alternative I. It is expected that continued protection and restoration of these communities, as emphasized in the rare community prescription will continue to ensure the presence and full functionality of this ecosystem.

Wet Savannahs and Flatwoods

Distribution, Status and Trend
The Coastal Plain Flatwoods, bogs, ponds and other embedded wetlands were once a frequent occurrence across the southeastern coastal plain landscape (Mount 1980, Platt 1998). The pine flatwoods, also referred to as wet pine savannah, wet woodland flatwoods and piney-woods bog complex (Mount 1980), is a fire subclimax community. The low pine flatwoods occur on low, flat terrain and is usually dominated by slash pine (Mount 1980). Wiregrass is a frequent ground cover, with pitcher plant bogs embedded sporadically throughout the flatwood area. In this community type, the water table is at or near the surface during the wet seasons of the year, although the ground may be quite dry near the middle of fall and the beginning of the winter season. Ponds, pools and bogs occur in flatwood depressions scattered across the landscape. Within the longleaf pine ecosystem, wet pine flatwoods are fairly distributed, often occurring in large patches (greater than 100 acres).

Habitat relationships and limiting factors
Soils typically consist of sands mixed with a high clay or organic component. These sites are extremely vulnerable to soil compaction, soil disturbance, rutting, depredation by feral hogs, and any other activity that disrupts the hydrology, especially during the wet season. Protection of these areas needs to be strongest during the wet season. There are numerous rare species associated with these rare community types including several species of orchids, yellow-eyed grasses and various carnivorous plants. This habitat is somewhat limited in abundance, but where it does occur, tends to be well-distributed over the appropriate landscape. This habitat has a moderate probability that it will exhibit limiting factors on the viability of associated plant species, especially where management can actually play upon the inherent dynamics present in this community.

Potential Management Effects
Fire plays a crucial role in the restoration and maintenance of these communities. Restoration and maintenance of these communities requires active and frequent management, including frequent or growing-season prescribed fire, hand removal of shrub or overstory, and thinning or mid-story control. Currently, these community types are becoming less common on the landscape. Although fire should be a primary tool used in restoration and maintenance of these communities, this is sometimes limited by smoke management, fuel loading, proximity to private lands or state highways or other critical considerations. A full range of additional restoration methods should be considered, including the restriction of mechanical access to the dry season, the use of vehicles equipped with low-psi, smooth rubber tires and other prescription-level mitigative methods associated with site-specific recommendations. Although the abundance and distribution of this habitat element is limited by the soils and

hydrology, management can actually play a more active role in restoration and maintenance of this community.

Determination and Rationale
Planned levels of maintenance and restoration activities on National Forest lands will influence the future abundance of coastal plain wetland communities. The ability to meet the activity levels requiring thinning, burning and/or restoration methods will depend on management intensity and emphasis on restoration as outlined in alternative I.

Mature Mesic Hardwood Forests

Distribution, Status and Trend
The mixed mesophytic community type typically thrives on north or north- east facing slopes and toe slopes, in association with small streams, narrow drains, well-drained floodplains and sheltered coves. The soils are fertile and well-drained and sunlight reaching the floor is moderate to low. According to Martin et al. (1993), mixed mesophytic forests are among the most biologically diverse ecosystems in the temperate regions of the world and can consist of over 30 canopy species. These community types will vary in species composition across the five National Forests in Alabama due to their occurrence in different geographical areas fairly distributed throughout the state. Variation in elevations, soils, and climatic factors all play a role in the assemblage of plants.

Habitat relationships and limiting factors
The abundance of mesic deciduous forests in the future will be primarily dependent on the management of existing hardwood stands to maintain hardwood dominance. However, there also are opportunities to increase the availability of these forests by restoring oak forests to appropriate sites now occupied by pine plantations. Mesic deciduous forests currently comprise between 1% and 10% of the land base in the National Forests in Alabama with a moderate possibility of limiting associated species due to lack of relative abundance.

Potential Management Effects
These forest types are characterized by relatively low levels of disturbance, and from a habitat perspective, their primary value is providing habitat for a variety of species dependent on mid- to late-successional forest stages. A key management issue for this community is maintenance of a high proportion of this type in mid- and late-successional conditions to provide habitat for associated species. There are a number of viability concern species that are broadly associated with mature mesic deciduous forests, and others that are more specifically associated with such forests at varying elevations. There is opportunity for decreasing risks to associated species through increasing restoration where appropriate.

Determination and Rationale
The cumulative effect on the quantity and distribution of mesic deciduous forests are determined by considering trends in the status of these communities through time and across private and public ownerships. Based on regional conditions reported in SAMAB (1996: 49) the National Forests in Alabama likely contain a relatively small proportion of known occurrences of this community type on a landscape scale. However, examples of the type on

private lands are unlikely to receive the same level of protection, where it is expected that the cumulative effects of development, recreational use, timber harvest, and other activities on these private lands will result in a decrease of good examples of these community types across the landscape. Even though people increasingly use the National Forest for recreational or social needs, protection actions will have positive effects, thus making national forest examples increasingly valuable as bio-reserves and contributing to regional conservation.

Mature Hemlock Forests

Distribution, Status and Trend
Eastern hemlock forests typically occur on acidic soils and often have a dense shrub layer composed of ericaceous species. On the Bankhead unit, they are usually associated with steep slopes and canyons directly adjacent to rivers and creeks. These communities are typically low in herbaceous diversity, but may support rich bryophyte communities. These are only known from the Bankhead National Forest, and even there are rare on the landscape.

Habitat relationships and limiting factors
Eastern hemlock occurs on less than 1% of the National Forests in Alabama land base. The current amount and distribution of mature eastern hemlock forests is threatened by the recent emergence of the hemlock wooly adelgid in the southern Appalachians. First identified in the eastern United States near Richmond, VA in 1924, this exotic pest has recently spread into the southern Appalachians and threatens to spread throughout the range causing mortality within five years after initial infestation (SAMAB 1996). However, as of 2002, no hemlock wooly adelgid has been identified on the National Forests in Alabama. All of this combines to pose a high likelihood of limitation to the viability of associated species.

Potential Management Effects
Eastern hemlock forests are naturally limited in distribution, occurring primarily in association with north facing coves and slopes and riparian systems**.** Under all alternatives forest-wide standards are included that defer existing hemlock forests from regeneration cutting during this plan period. In general, the use of prescribed fire will be consistent with the vegetation management, which is low. Prescribed burning in hemlock forests will only occur as part of a larger prescribed burn and will only be allowed to back through the hemlock sites. No fire lines will be constructed in these areas. Regardless of management efforts, this habitat is expected to decrease in distribution and abundance as a result of factors substantially outside of agency control.

Determination and Rationale
Hemlock forests would be managed to optimize its natural distribution, abundance, and condition in all plan alternatives, potential effects through plan implementation to these vegetative communities should be as positive as can be expected, given the inherent threats to this system. There are twenty-six species of plants and animals with viability concerns that are associated with hemlock forests.

Mature Oak Forests

Distribution, Status and Trend
In the southern United States, acres of oak-hickory and oak-pine forests have increased over the last 50 years. (USDA Forest Service 2001: 49). Oak and oak-pine forests are common throughout the South, comprising over half of the timberland of the region as a whole (USDA Forest Service 2001: 91-92). Oak-hickory forests are the dominant forest type in the Southern Appalachian Ecoregion, and are codominant with loblolly-shortleaf pine forests in the Piedmont Ecoregion. Southern yellow pine forest types dominate the Coastal Plain Ecoregion, but oak and oak-pine forests still comprise nearly 30 percent of the timberland in the Southern Appalachian Ecoregion.

Habitat relationships and limiting factors
Although the abundance of oak-pine forests in Alabama at the time of European settlement is not clear, a variety of natural and anthropogenic factors may have enhanced and maintained this forest type before pre-settlement times. For example, the periodic occurrence of insect pathogens, ice storms, lightning fires, and the use of fire by Native Americans may have maintained this forest type. At present, fire suppression efforts over many decades have increased the abundance of fire-intolerant species such as red maple and sourwood, which have invaded this forest type. These pose a moderate to low probability of limitation to the viability of associated species.

Potential Management Effects
The xeric to mesic oak-pine forests considered here are oak-dominated forests containing a significant pine component. In some cases, these oak-dominated forests are presently more common due to fire suppression and encroachment within the pine and pine-oak forests. However, periodic, low-intensity fires are important to the ecology and sustainability of oak-pine forests. In fact, plant diversity in most dry and dry-mesic oak-pine forests is relatively low, particularly in the absence of fire when one or two layers of ericaceous species dominate the forest under-story (White and Lloyd 1998). It is given that some decline of this habitat element is to be expected based on management action and increased burning. However, as more information becomes available, it is indicative that some of the higher quality sites and the higher diversity exist in those systems that have a lower basal area, but a higher frequency of later summer and fall burns.

Determination and Rationale
Oak and oak-pine forests are common on the National Forests in Alabama as well as on adjacent forest industry, nonindustrial private, and other public lands (Thompson 1998a,b). Management opportunities permitted in most alternatives would ensure continued oak dominance on national forest lands. However, the majority of these oak forests are on nonindustrial private lands. These lands are the least likely to receive active forest management and therefore the loss of oak dominance is likely to be more problematic in these areas.

Mature Yellow Pine Forests

Distribution, Status and Trend

During the last 50 years across the southeastern United States, pine plantations have increased, expanding from 1% of the total pine forest acres to 48% of those acres (USDA Forest Service 2001: 1). At the same time, the 20-year trend reported for the Southern Appalachian Assessment area (SAMAB 1996: 27) shows a downward trend of 16% for mature southern yellow pine forests. These two facts together suggest that natural yellow pine forests have declined significantly and represent an opportunity for large-scale restoration of this community type.

Habitat relationships and limiting factors
Several species of viability concern are associated with late-successional southern yellow pine forests maintained in open conditions by frequent fire. (EIS, Appendix F). While public lands support the majority of late-successional acres, the structure and composition of these forests has been altered due to years of fire suppression resulting in less than optimal habitat conditions. Fire intolerant species such as Virginia pine have proliferated while other pines (shortleaf, pitch, table mountain, longleaf) have seen dramatic declines (NatureServe 2002, Martin et al 1993). In the absence of fire, hardwoods, shrubs, and vines have replaced the open, grassy, herbaceous layer that is characteristic of frequently burned areas, and hardwoods have encroached into the midstory further affecting forest structure. This change in forest structure and resulting habitat condition has had a direct effect on species dependent upon these communities. In addition to declines in species dependent upon specific habitat attributes, entire pine communities are in decline. This may be due to several factors including fire suppression, land conversion, population growth and other human-induced impacts.

Potential Management Effects
For the National Forests in Alabama, alternative I provides the most opportunity for management of mature yellow pine forests. The ability to use fire as a management tool will play a critical part in restoring natural species assemblages and forest structure within the southern yellow pine communities. The Broomsedge Bluestem grasses are species which show direct increase due to canopy openings and prescribed burning, and can often be tied to healthy mixed pine and pine oak forests (Varner, 1998). Projected activities should be sufficient to enhance existing habitat conditions within pine and pine-oak forests above their current levels. Longer rotation ages coupled with more frequent fire will enhance habitat attributes such as grassy understories and standing snags needed by several declining bird species (Dickson 2001). Analysis indicates that in 50 years this habitat element will be relatively abundant and well distributed across the forest.

Determination and Rationale
Pine and pine-oak forests are common on the National Forests in Alabama as well as on adjacent private and public lands. The distribution of age classes varies considerably based upon ownership patterns, with the majority of older pine forests occurring on public lands. Management opportunities will ensure continued persistence of these communities on national forest lands with a focus on maintenance and restoration of natural species assemblages. Public lands already provide a vital function in providing the bulk of mid- and late-successional southern yellow pine forests and as restoration proceeds within these communities on national forest lands, the importance of these habitats to species of regional viability concern will increase.

Mature Longleaf Pine Forests

Distribution, Status and Trend
The Coastal Plain Upland Longleaf Pine communities used to encompass over 90 million acres of the Gulf and Atlantic Coastal Plain (MacRoberts, 1991, Platt, 1998). The longleaf pine savannah, also called wet woodlands and rolling hill savannahs (Mount 1980), is a fire subclimax community. It is typically dominated by longleaf pine. The soils where the pine exist are well drained, but in most cases, not excessively so. A sandy topsoil may be present, but is often shallow. Because of the fire dependence, the burning rotation on the coastal plain has been observed to fall within a range of 1-5 years, with an average range for prescribed burning on a 2-4 year rotation. This range of fire occurrence may include restoration as well as maintenance purposes. Understory trees are often few and widely spaced including pine regeneration. The ground cover varies, but includes a variety of wiregrass, bluestem and bracken fern. Herbaceous legumes tend to be common in relatively open areas. This habitat occurs on the majority of the Conecuh, Oakmulgee and Tuskegee units in Alabama.

Habitat relationships and limiting factors
The upland longleaf pine ecosystem, with it's embedded communities used to be found as the dominant association throughout the coastal plain. In many cases, the lands administered by the privately funded conservation groups, state and federal agencies serve as a refuge for the last remaining coastal plain longleaf pine associations, with their attendant natural rare plant communities and species. The upland longleaf pine communities that remain encompass less than 1 percent of their historical occurrence, especially on private lands, largely due to development and other extensive anthropogenic disturbance.

Potential Management Effects
Restoration and maintenance activities that result in an open forest canopy such as prescribed burning (including dormant, frequent, and summer burning), thinning, mid-story removal, mowing, and possible direct herbicide application directly affects the abundance of this community type.

Determination and Rationale
Planned levels of maintenance and restoration activities on National Forest lands will influence the future abundance of coastal plain upland communities. The ability to meet the activity levels requiring thinning, burning and/or restoration methods will determine the final restoration and/or maintenance of this community. These upland coastal plain habitats will continue to reflect the trend set forth in under the direct effects section of the EIS, with the greatest benefits arising from the restoration and management activities under Alternative I. It is expected that continued protection and restoration of these communities, as emphasized in the rare community prescription will continue to ensure the presence and full functionality of this ecosystem.

Mature Mountain Longleaf Pine Forests

Distribution, Status and Trend
Mountain longleaf, a small subset of the vast longleaf forest of the south, is a critically endangered component of the once vast longleaf pine forests that stretched from Virginia to east Texas (Varner et al 2000). Mountain longleaf is known to occur in the Blue Ridge and Ridge & Valley physiographic regions at the southern terminus of the Appalachian Mountains. Mountain longleaf occurs primarily on the ridges and southern/western aspects of the region, and was historically found in pure longleaf patches, embedded in a landscape composed of mixed pine-hardwood stands.

Habitat relationships and limiting factors
The mountain (or montane) longleaf community was historically maintained in an open forest community by fire, both natural ignitions (such as lightning) and anthropogenic fire (Komarek 1974, Robbins and Myers 1992). As such, the system is fire dependent to maintain the open stand structure, species composition and forest function. Current research indicates that a fire return of two years is necessary to gain the stand structure of a savannah, with two to four year returns for maintenance of the species composition (Varner et al 2000). Fire suppression, conversion, naval store use, feral hogs and commercial development have greatly reduced the acreage in longleaf forest.
Perhaps the most important component in determining the successional stage in a mountain longleaf system, are the bluestem grasses. Bluestems (*Andropogon ternarius, A. virginicus* and *A. scoparius*) are abundant in frequently burned longleaf pine stands throughout their range. In many cases, the community type is named the longleaf-bluestem community, recognizing the critical importance of the understory grasses in the system. As fire frequency increases, the abundance and percent cover, in bluestems increases and conversely, as fire return decreases, bluestems decline or disappear entirely as woody species encroach into the stand.

Potential Management Effects
Restoration and maintenance of these communities requires active and frequent management, including rapid rotational burning, growing-season prescribed fire or mowing, and thinning or mid-story control. Currently, these community types are becoming less common on the landscape, although the restoration potential is great. In addition, since the age of the standing mountain longleaf is critical for several species, the restoration effort will take time to allow trees to age sufficiently to support red-cockaded woodpeckers and other cavity dependent species. Although fire should be a primary tool used in restoration and maintenance of these communities, this is sometimes limited by smoke management, fuel loading, proximity to private lands or state highways or other critical considerations. Additional methods should be considered during restoration using a full range of available options and site-specific recommendations

Determination and Rationale
The mountain longleaf pine-bluestem ecosystem, with its embedded communities used to be found as the dominant association in the ridges and south/western facing slopes of the Blue Ridge and Ridge & Valley provinces. In many cases, these critical lands have been drastically reduced due to fire suppression and land management uses. The mountain longleaf pine communities that remain encompass less than 1 percent of their historical occurrence,

especially on private lands, largely due to development and other extensive anthropogenic disturbance. Since the system is actively restored and maintained with the use of fire, as a fire dependent system, it is unlikely that large scale restoration of the system will occur in the future across it's historic range. These critical habitats will continue to reflect the greatest benefits arising from the restoration and management activities under Alternative I.

Canopy Gaps

Distribution, Status and Trend
Canopy gaps offer an early successional stage for species which can occur in conjunction with nearly any other habitat. These have been observed to be fairly common across the landscapes of all the ecoregions, and are present in nearly every habitat on national forest lands. They are also fairly well distributed throughout the landscape, offering micro-habitat for those associated species which will thrive under those conditions. Under both the current and proposed alternative for the National Forests in Alabama, canopy gaps are expected to persist and be maintained both naturally and with management assistance where necessary.

Habitat relationships and limiting factors
Since the canopy gap is more a condition or opportunity rather than a true habitat, by nature it is transitory, with ephemeral effects. However, the opportunities thus created by the canopy gap can often allow associated rare or sensitive species the chance to flower, put on fruit and maintain the seedbank within a larger habitat or community. Canopy gaps can have a moderate to low impact as a limiting factor to certain associated rare or sensitive plant species, dependent upon the larger habitat in which the gap is present. It is clear, however, that often these temporary gaps can result in an increase in flowering and fruiting of specific plant species.

Potential Management Effects
Canopy gaps can be singletree or multiple tree gaps. Windthrow, storms, insects, disease, flooding, and fire can all play a role in gap creation. Gap effects can also be seen along manmade openings, singletree removal, small SPB sites and from other related activities. The abundance and distribution of these can be improved through purposeful restoration or providing for successional progression in an un-even-aged setting. Maintenance and restoration are key goals to establishing and maintaining these gap effects.

Determination and Rationale
Since canopy gaps are often fairly limited in size, it is estimated that these are some of the most easily replicated form of habitat or sub-habitat that can be directly created, restored or maintained within a system. Based on their abundance and low likelihood of limitation of viability of any associated species, this habitat will continue to persist and quite probably flourish under the preferred alternative.

Woodlands, Savannas and Grasslands

Distribution, Status and Trend

Permanent grasslands, savannas, and woodlands were once a frequent occurrence across the southeastern landscape (DeSelm and Murdock, 1993; Davis et.al, 2002). Based on physiognomic class definitions from the the International Community Classification System (Natureserve, 2002), woodlands are open stands of trees with crowns usually not touching (forming 25%-60% canopy cover), and savannas, either hardwood or pine, have only scattered tree cover occupying no more than 25% canopy cover. Grassland, savanna, and woodland habitats differ from early successional habitats in that they are maintained permanently open using prescribed fire or mowing, and differ from xeric oak and southern pine forests in that tree densities are lower than those found in forests, especially even-aged forests.

Habitat relationships and limiting factors
All associated woodlands, savannas and grassland communities have dense herbaceous understories dominated by grasses such as little bluestem, Indiangrass, and needlegrass, and forbs such as asters, goldenrods, and legumes. Numbers of species of concern compiled as part of the Southern Appalachian Forest planning process include 26 species from the piedmont and 90 species from the Southern Appalachians. Of these, the majority are vascular plants. There is a moderate probability of the habitat abundance affecting associated species viability.

Potential Management Effects
Restoration and maintenance of these communities requires active and frequent management, including frequent or growing-season prescribed fire or mowing, and often associated with thinning or mid-story control. Currently, these community types are rare on the landscape, although the restoration potential is great, primarily limited by smoke management associated with prescribed burning at urban interfaces. Opportunities for the restoration of woodland/savannas occur on xeric, subxeric, and intermediate sites occurring along ridgetops, south, or west-facing aspects, and can have positive effects on viability through active management and restoration efforts.

Determination and Rationale
Restoration and maintenance are likely to benefit habitat for species included within this habitat association. Although the analysis indicates that this habitat element is well distributed across the landscape, but is currently very rare. Under Alternative I, this habitat element is expected to increase over the life of the Forest Plan.

Cedar Woodlands

Distribution, Status and Trend
The cedar woodland forest and cedar glades typically occur on areas of limestone or dolomite rock. They are associated with shallow or rocky soils or outcrops. Cedar glades occur primarily in the Interior Low Plateau province of the eastern United States. Its center of distribution is in middle Tennessee and radiates out to adjacent states, which includes northwest Alabama. The cedar glade community can be sporadically found in other physiographic provinces. (Quarterman, 1986)

Cedar woodlands and cedar glades are found on approximately less than 1% of the Bankhead National Forest. These forest types are characterized by relatively low levels of disturbance, and from a habitat perspective, their primary value is providing habitat for a variety of species dependent on early- to late-successional forest stages.

Habitat Relationships and Limiting Factors
The cumulative effect on the quantity and distribution of cedar woodland forests and cedar glades is determined by considering trends in the status of these communities through time and across private and public ownerships. Even though people increasingly use the National Forest for recreational or social needs, protection actions will have positive effects. However, based on regional conditions reported in SAMAB (1996: 49) the Bankhead National Forest contains a relatively small proportion of known occurrences of this community type; examples of the type on private lands are unlikely to receive the same level of protection. It is expected that the cumulative effects of development, recreational use, timber harvest, and other activities on private lands will result in a decrease of good examples of these community types across the landscape, making national forest examples increasingly valuable to regional conservation. There is currently a moderate potential that the abundance and condition of this habitat type will have an effect on the viability of associated species.

Potential Management Effects
The primary management recommendation is protection from activities that could disrupt the glades or woodlands or other community structures and functions. Specifically, these include protection from disturbance during development of roads, and maintenance of desirable in-stream flows, maintaining an open woodland quality, buffer zones to keep equipment out and disallowing excessive fuel loading within the habitat. Protection, maintenance and restoration to all occurrences is recommended, keeping management and condition near optimal.

Determination and Rationale
Cedar woodlands have been ranked as relatively rare on the landscape, and a rare community. Since rare communities would be protected or restored across all alternatives, the effects of National Forest management on these communities and associated species would be positive under all alternatives. In an effort to restore some of the ecological role that these communities have historically played, the revised Plan (Alternative I) will contain objectives for restoring complexes of cedar woodlands and cedar glades. However, it should be understood that this community will remain relatively rare on the forest because of its naturally limited distribution.

Late Successional Riparian

Distribution, Status and Trend
The river floodplain hardwood community type is common in active flood plains on large river systems and sandbars. Following disturbance, this community may form farther from the riverbank. This community type may also occur within narrow box canyons, V- shaped ravines, on colluvial deposits, and on narrow, confined terraces. It may also encompass hemlock canyons, exhibit old-growth characteristics, or transition into mesic hardwood forests. Flooding is usually infrequent; however, they may be temporarily flooded in the spring (The Nature Conservancy, 2000). These forest types are characterized by relatively low levels of

disturbance, and from a habitat perspective, their primary value is providing habitat for a variety of species dependent on mid- to late-successional forest stages.

Habitat relationships and limiting factors
Bottomland hardwood forests are becoming less common, comprising 1.2 % of the land area of the SAA area. The forest type is least abundant in the river floodplain hardwood communities. Decline can most likely be attributed to logging with none to little hardwood regeneration. However, on a landscape level, late successional riparian forests, encompassing all forest types, are found throughout the planning area. Because of the riparian guidelines and existing standards, there is little likelihood that this community will have impacts on associated species viability.

Potential Management Effects
A key management issue for this community is maintenance of a high proportion of this type in mid- and late-successional conditions to provide habitat for associated species. There are a number of viability concern species that are broadly associated with mature mesic deciduous forests, and others that are more specifically associated with such forests at varying elevations. However, this habitat is currently being maintained, although location of elements may shift over time as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to maintain and increase abundance of this habitat.

Determination and Rationale
The cumulative effect on the quantity and distribution of bottomland hardwood forests are determined by considering trends in the status of these communities through time and across private and public ownerships.. Based on regional conditions reported in SAMAB (1996: 49) the National Forests in Alabama likely contain a relatively small proportion of known occurrences of this community type on a landscape scale. However, examples of the type on private lands are unlikely to receive the same level of protection, where it is expected that the cumulative effects of development, recreational use, timber harvest, and other activities on these private lands will result in a decrease of good examples of these community types across the landscape. Even though people increasingly use the National Forest for recreational or social needs, protection actions will have positive effects, thus making national forest examples increasingly valuable as bio-reserves and contributing to regional conservation.

Early Successional Riparian

Distribution, Status and Trend
Riparian habitats encompass the transition area between aquatic systems and upland terrestrial systems. Riparian habitats include a mosaic of native plant and animal communities (with associated native species) and successional stages. Within the vegetation mosaic, mature forest or old-growth conditions predominate because the majority of species dependent on riparian habitat require older forest conditions. As a result, early successional riparian habitat mainly consists of single tree canopy gaps, frequent flood damage, alluvial meadows and stream scour as well as some canebrake habitat overlaps.

Within the Southern Appalachian Assessment (Assessment) study area there are approximately 2.3 million acres in the riparian zone. The land cover classes for the riparian study area were as follows: 70 percent forested, 22 percent pasture/herbaceous, 3 percent cropland, 4.3 percent developed/barren, and 0.7 percent wetland. Ownership of land in the riparian zone in the Assessment area is mainly private, approximately 85%, with national forests being the next major owner at approximately 10%. The remaining 5% is owned by national parks, the Cherokee Indians, other federal holdings, and state parks and forests (SAMAB 1996). It has been estimated that less than 1% of the current riparian habitat on the National Forests in Alabama is in an early seral stage, although exact numbers do not currently exist at this time.

Habitat relationships and limiting factors
Natural disturbances such as floods, channel meanders, beaver activity, hurricanes, windstorms, ice damage, insect and disease outbreaks and fires can be important natural causes of early seral conditions that are necessary for certain species and plant communities, and can have a direct impact upon species viability. To achieve the desired habitat conditions described above, the Plan designates riparian corridors for perennial and intermittent streams, and common standards for channeled ephemeral streams. Because the riparian corridor will be managed to retain, restore, and/or enhance the inherent ecological processes and functions of the associated aquatic, riparian, and upland components within the corridor, this will be accomplished through riparian corridor guidance and standards, and applicable common standards. These standards and guidelines may have a beneficial effect on the communities and their associated species

Potential Management Effects
The management goal for the riparian habitats is to maintain or enhance the structural and functional integrity of riparian habitat and associated aquatic and upland habitat. Riparian corridors include the concept of buffering streams to retain important stream functions, but they also encompass the functional aspects of riparian areas relative to uplands. Therefore, they present the opportunity to manage riparian habitat as a more completely functioning system in which streams and uplands mutually influence each other (Knutson and Naef, 1997, Tiner 1999). The opportunity to increase the rate of restoration may have a beneficial effect on the viability of associated species.

Determination and Rationale
Plan management direction is to retain, restore, and/or enhance riparian habitat. Goals, objectives, standards, and guidelines for riparian corridors and channeled ephemeral streams will be followed. Because priority is put on these communities, national forest management is expected to have no adverse effect on them, and may be beneficial in many cases.

VII. B. 2. Regional Forester Sensitive Species – The Federal Candidate Species

Georgia Rockcress (*Arabis georgiana)*

Distribution, Status, and Trend
Georgia Rockcress, a federal candidate, is typically found alongside rivers or streams on glades or rock barren outcrops in Georgia and Alabama. It has been found on the Oakmulgee Ranger

District on the National Forests in Alabama, on the northern section. It typically blooms from March to May, producing fruits from May to August. It is recommended to search during the fruiting period since these are the key field identification characteristics. It is found in the Coastal Plain, Piedmont and Ridge & Valley ecoregions of Alabama. Georgia rockcress is apparently rare throughout it's range, although a few large populations have been found in Alabama. It is currently being evaluated by the USFWS for proposal for listing, thus the candidate species status.

Habitat relationships and limiting factors
Habitat has been described as rocky (limestone, shale or granite-gneiss) bluffs and slopes along water courses as well as along sandy eroding riverbanks ((Patrick et al, 1995). These types of habitat, due to the interface of the glades and bluffs with the streams or rivers, are of necessity limited to specific areas. Lack of fire and loss of habitat due to development or access creation have been the main limiting factors

Potential Management Effects
All cedar glade communities, habitat at for the Georgia rockcress, would be managed under the 9F (rare community) prescription under all alternatives. Several standards for rare communities ensure their maintenance and restoration across the landscape. Rare communities would be protected from detrimental effects caused by management actions across all alternatives. Rare communities would be inventoried in proposed project areas when projects are being proposed which have the potential to adversely affect them.

Since federal candidate plant species receive little or no legal protection on private land, this species may be vulnerable to extirpation on surrounding glades and suitable habitat. National Forest lands need to be especially cautious to retain and positively manage any habitat and occupied habitat for this species

Determination and Rationale
It is important to realize that the dolomite glades of Alabama are a highly localized feature with several endemic rare plant species; thus may be more sensitive to environmental or site-specific events, beyond the control of forest management implementation. However, based on the retention, maintenance and restoration imperatives of the rare community (9F) prescription, and under the implementation of Alternative I, a determination of "**may impact individuals but not likely to cause a trend to federal listing or a loss of viability**" is implicated for the Georgia rockcress.

Georgia Aster – (*Aster georgianus)*

Distribution, Status, and Trend
Georgia Aster, a candidate for federal listing, is a plant of roadsides, open woods, barrens and glades, utility rights-of-way, or other sunny situations, and appears to be adaptable to dry, open habitats independent of soil type (Mathews, 1993). Georgia Aster is known to occur in Alabama, North Carolina, Georgia, South Carolina, and Virginia. Based on information summarized in a status survey completed in December 1993, there are 56 surviving

populations, though many appear to be declining (Matthews 1993). On the Talladega National Forest, Georgia Aster occurs at 3 geographically distinct sites (Survey information 2002) including one occurrence that has been suggested may be the largest known site found to date in Alabama (ALNHP 2002). All sites occur along roadsides or powerline rights-of-way, making them vulnerable to management actions. However, two of the populations found on the Talladega National Forest are at low numbers (unpublished data, USDA Forest Service).

Habitat relationships and limiting factors
Historically, much of the species' habitat was xeric woodlands, savannas, or grasslands that were maintained in an open condition by fires caused by lightning or Native American burning (Mathews 1995; Davis et al. 2002).

Potential Management Effects
The Revised Forest Plan (Alternative I) includes a forest-wide objective to maintain existing populations of Georgia Aster at a desired minimum population size of 250 individuals each. A population size of at least 250 plants may ensure maintenance of genetic diversity, protect against random events that may lead to local extinctions, and facilitate attraction of pollinators (Kindscher 2002). Maintenance of existing populations is provided by general standards requiring protection and maintenance of sites supporting populations needed to maintain species viability, plus other Forest Service policy (FSM 2670.22) designed to ensure Forest Service actions do not contribute to the need for federal listing of species under the Endangered Species Act. This objective and policy provisions are the same across all alternatives. Maintenance of existing sites would likely involve prescribed burning, but could also include other vegetation management treatments, such as vegetation cutting where needed to control competing vegetation. Broadcast herbicide (including boom spraying and backpack spraying) is detrimental to the species (Kral, pers comm 2002). Site-specific planning of these activities would be used to ensure that adverse effects to populations would not occur. Seed collection, propagation, or out planting, may also be used to supplement populations or ensure their spread from rights-of-way into adjacent stands.

Additional objectives included in the Revised Forest Plan should increase abundance of optimal habitat for this species and create opportunity for establishment of new populations. Objectives call for restoration and maintenance of woodland, savanna, and grassland habitats. In addition, glades and barrens, with which this species is sometimes associated, are identified as rare communities and would be restored or maintained. Ongoing inventories would continue to document new occurrences in these habitats, providing them with the site-specific protections afforded to existing sites.

Because rare plants often receive little or no protection on private land, and are often not well inventoried, public land plays a critical role in their conservation. Additionally, occurrence of this species on roadsides and utility corridors, and requirements for active management, namely prescribed fire, suggest that this species will continue to be vulnerable to extirpation on private land in the future. Cumulatively, therefore, persistence of the species in the area of the national forest, as well as across its range, will be greatly enhanced from efforts on the national forest to maintain and expand populations.

Determination and Rationale
Based on provisions for protection and maintenance of existing Georgia Aster population sites, as well as objectives for restoring and improving suitable habitat, the alternative I is expected to potentially have a beneficial impact, and **may impact individuals but not likely to cause a trend towards federal listing or loss of viability** on the Georgia Aster.

Fleshy-fruited Glade-cress (*Leavenworthia crassa Rollins var crassa)*

Distribution, Status, and Trend
The Fleshy-fruited glade-cress is listed as a Candidate for federal listing by the USFWS and is on the Regional Forester's Sensitive Species list for the southern region, USDAFS. This is only known to occur in southeastern Lawrence and southwestern Morgan counties in Alabama. This glade-cress has been found in two glades on the Bankhead National Forest. It has been reported but believed to be extirpated from Lauderdale County (McDaniels et al 1987).

Habitat relationships and limiting factors
This gladecress is an annual herb occurring on limestone glades, fallow fields and along roadsides on the Cumberland Plateau ecoregion (McDaniels et al 1987). It can be locally abundant in only a few areas within this small range.

Potential Management Effects
Gladecress prefers a sunny, open habitat. Canopy openings around the margins of limestone open and cedar glades should prove beneficial to this species as long as no habitat is altered, rutted, entered by mechanical means or otherwise destroyed. Fire may be beneficial as long as the fuels are not heavy and the fires are not intense or for long duration. Monitoring should be conducted before and after all burning activities (Kral 1983). Also, if a glade is not actively managed, over time it will become encroached by eastern red cedar and other hardwoods, rendering it too shady for the gladecress

All cedar glade communities, habitat at for fleshy-fruited glade-cress, would be managed under the 9F (rare community) prescription under all alternatives. Several standards for rare communities ensure their maintenance and restoration across the landscape. Rare communities would be protected from detrimental effects caused by management actions across all alternatives. Rare communities would be inventoried in proposed project areas when projects are being proposed which have the potential to adversely affect them.

Since federal candidate plant species receive little or no legal protection on private land, this species may be vulnerable to extirpation on surrounding glades and suitable habitat. National Forest lands need to be especially cautious to retain and positively manage any habitat and occupied habitat for this species.

Determination and Rationale
It is important to realize that the Fleshy-fruited glade-cress is an annual, and thus may be more sensitive to environmental or site-specific events, beyond the control of forest management

implementation. However, based on the retention, maintenance and restoration imperatives of the rare community prescription, under the implementation of alternative I a determination of "**may impact individuals but not likely to cause a trend to federal listing or a loss of viability**" is implicated for the Fleshy-fruited glade-cress.

White Fringeless Orchid (*Platanthera integrilabia*)

Distribution, Status, and Trend
White fringeless orchid (*Platanthera integrilabia*) is listed as a Candidate for federal listing by the US Fish and Wildlife Service and is on the Regional Forester's Sensitive Species List for the Southern Region. A Conservation Strategy (Bailey, 2001) was developed for this species in 2001 that includes a rangewide summary of existing population information and a comprehensive literature review. Much of the information provided below is taken from that document.

Platanthera integrilabia (Corell) Luer is currently known from a total of sixty-one extant locations within five states (Alabama, Georgia, Kentucky, Mississippi, and Tennessee) and is considered extirpated from three states (North Carolina, South Carolina, and Virginia). Existing populations are summarized in Table 1

Platanthera integrilabia is known from 4 locations on the Shoal Creek, 1 location on the Talladega, and 1 location on the Bankhead. The Talladega site (first reported in 1992) contains approximately 5 individuals, two of which were in flower when first discovered. The Shoal Creek Sites (first reported in 1995) are estimated to contain several hundred plants and is the largest known site in Alabama for this rare plant.

Habitat relationships and limiting factors
Platanthera integrilabia populations occur across a wide geographic area and consequently are found under a diverse array of environmental conditions. Because of this, it is difficult to characterize the specific habitat requirements for any given locale, however, in general plants are found in wet, boggy areas, stream heads, or seepage slopes in acidic muck or sand, in flat or at the bottom of sharply sloped streamside in association with species of *Sphagnum* moss and one or more of the following fern species: Cinnamon fern (*Osmunda cinnamomea*), chain fern (*Woodwardia areolata*), and New York fern (*Thelyptris noveboracensis*).

The rarity of *Platanthera integrilabia* throughout it's range may be dependent on a combination of several factors including natural rarity of habitat, habitat loss, low seed germination rates, low flowering and fruit-set rates, and lack of effective pollinators. Habitat loss is recognized as the primary threat to the species rangewide and can be manifested directly through habitat conversion, or indirectly, though alterations to the hydrology at a given site that occur as secondary effects from activities such as road building, timber harvest, mechanical entry, horse logging, rutting, etc. Siltation of habitat, herbivory, and competition from exotic species are other threats that may impact populations.

Like many orchid species, *Platanthera integrilabia* is dependent upon a symbiotic relationship with a fungus for seed germination (Zettler et al. 1990, Zettler and McInnis 1992, Zettler 1994, Currah et al. 1997). While an individual orchid capsule may produce thousands of dust-like seeds, only a tiny fraction of those seeds will be dispersed to a site that supports adequate habitat conditions and the required fungal species for seed germination. While many orchid species have a symbiotic relationship with several different fungal species, it has been suggested (Crock 1996, Zettler 1996) that the distribution of *Platanthera integrilabia* is further limited by the fact that there may be only a single fungal symbiont capable of initiating seed germination. Zettler (1996) showed that both in the lab and under natural conditions only 3% of *Platanthera integrilabia* seeds germinate to produce a seedling plant. Similarly, only a very small percentage of individuals ever flower and set viable seeds. With so many biological constraints affecting the viability of populations, the importance of maintaining existing populations and quality habitat through land management is heightened.

Under the Revised Forest Plan the integrity of these sites will be protected in all alternatives by adherence to the standards listed in the riparian prescription. The Shoal Creek sites are also allocated to the rare community prescription.

Potential Management Effects
A Conservation Strategy (Bailey 2001) that was completed for Platanthera integrilabia emphasizes monitoring of existing populations and inventory of suitable habitats to locate new populations. Major threats to National Forests in Alabama populations are feral hogs, plant poachers, exotic/invasive plants, and alterations to existing hydrology and timber management activities.

Annual monitoring of a site in Tennessee has detected the presence of the non-native grass *Microstegium vimineum* in the small drainages that feed the bog. Indications of a potential problem have been sighted near two Alabama sites. This species rapidly colonizes disturbed soils in both full sun and shaded conditions and is extremely difficult to eradicate, but the species seems unable to penetrate the established, dense herbaceous cover within the bog. At this time there is no practical method to treat this species near this site without adverse effects to numerous other species in the area. This may change in the future if the species is able to invade the bog.

The Rare Community (9F) and Riparian (11) prescriptions provide adequate protection for Platanthera integrilabia from potential negative effects of management activities on the Shoal Creek District. The Talladega District site has not been surveyed for criteria making it eligible for rare community status but may be currently protected by the riparian prescription, which is designed to maintain the integrity of habitats within that zone. If the site is determined to meet the definitions of one of the National Forests in Alabama Rare Communities, it will also be managed under the Rare Community prescription Standards. Additionally, the National Forests in Alabama Revised Forest Plan includes forest-wide standards that 1) protect individuals and locations of species needed to maintain their viability within the planning area, and, 2) control exotic species where they are causing adverse effects to species of viability concern within the planning area.

The combination of prescription allocations, forest-wide standards, and site specific mitigations described above afford very good protection to Platanthera integrilabia populations and habitats from potential negative effects due to forest management activities. Despite this, the species has some inherent biological limitations that could continue to pose risks to its long-term viability, especially at sites where population numbers are low.

Determination and Rationale
On the National Forests in Alabama, all wetland habitats and known sites for Platanthera integrilabia are currently protected under all Plan alternatives. Additionally, pre-project surveys will be conducted in all areas within close proximity to known or potential habitat for the species to ensure that secondary effects do not alter the integrity of sites. Potential impacts to individuals remain at all sites through plant poaching. An assessment of potential impacts from invasive exotic plants has not indicated a tangible threat this time. Inherent biological limitations based upon population dynamics may continue to pose risks to the species long-term viability, especially at small sites. Based upon this, under the implementation of any Plan alternative a determination of "**may impact individuals but not likely to cause a trend to federal listing or a loss of viability**" is made for Platanthera integrilabia.

VII. B. 3. **Regional Forester Sensitive Species**

A Liverwort (*Aneura maxima* =[*A. sharpii*]) is currently known from a few locations on the Bankhead National Forest. This Appalachian endemic is known from the mountains of Vermont south to North Carolina and Alabama. It is typically found on humus or gravelly soil at the base of wet outcrops, along streams, and around waterfalls (Hicks 1992). It is found in and around rock house rare communities. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

A Liverwort (*Cheilolejeunea evansii*) is currently known from less than 5 locations on the Bankhead National Forest. This species is found on the bark of trees in moist escarpment gorges, in the hemlock canyons. This is a disjunct population from the South and North Carolina sites, where it was believed to be a rare endemic. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Liverwort (*Nardia lescurii*) has been identified as occurring in rock shelters and on peaty soils over rocks in canyons containing riparian areas on the Bankhead National Forest. This is a

Southern Appalachian endemic species from Virginia to Georgia and Alabama. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Liverwort (*Pellia X appalachiana*) is currently known from 2 locations on the Bankhead National Forest. This species is associated with late-successional mature riparian habitat in canyons and rock cliffs. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability.**

Liverwort (*Plagiochila echinata*) is currently known from locations on the Talladega and Bankhead management units. It is tied to cliff habitat, and late-successional riparian forests, and bases of cliff bluffs. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability.**

Liverwort (*Radula sullivantii*) is another species that has been found in less than 5 locations on the Bankhead National forest as part of a disjunct population. This has formerly been considered to be endemic to the Appalachian Mountains of North Carolina, South Carolina, Georgia and Tennessee. It prefers shaded rock outcrops around streams and waterfalls as well as mesic rock houses in canyons and rock gorges. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Liverwort (*Riccardia jugata*) is associated with downed wood in late successional riparian forest habitat. It occurs on wet wood and humus in moist areas, and is endemic to the Appalachian Mountains in North Carolina and Tennessee. The current population occurs in the hemlock canyon corridor and rock houses on the Bankhead, far separated from the NC and Tennessee populations. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Little Georgia Moss (*Tetrodontium brownianum*) has been found on the ridgetops of the Talladega Mountains and on the Bankhead National Forest. It is associated with rock outcrops and cliffs, spray cliffs and late successional riparian habitat. On the Bankhead, this falls within the canyon corridor prescription. On both units, it is covered by the riparian prescription that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability.**

Small-flowered buckeye (*Aesculus parviflora*)
This species has been assigned an F1/F2 ranking for combined locations on the Bankhead, Talladega, and Oakmulgee units. It is found in the coastal plain as well as on the Cumberland plateau, ranging from Alabama and South Carolina to Georgia and Florida. Occurs in an open woodland setting, often in a mesic hardwood community.

This species has a moderately high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. It is very rare on the forest units, and high quality occurrences with large numbers of individuals are not known to occur.

Management actions may include some canopy gap creation, but for the most part, this species does well under full canopy. It does tolerate low fires, and tends to root sprout when disturbed. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Pinelands false foxglove (*Agalinis divaricata*)
This species is ranked as an F1 on the Conecuh National Forest. This species tends to prefer open longleaf pine savannah habitats. It prefers open canopy, with little to no shrub competition.

There is a low likelihood of limitation to the species because of the habitat and as a result this species has only a moderately high viability risk. However, efforts to restore the longleaf pine habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Incised agrimony (*Agrimonia incisa*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Conecuh National Forest (FP), since it has been found within 1 mile of the administrative boundary. This species is a lower gulf coastal plain endemic that occurs within the longleaf pine ecosystem. Habitat includes sandhills and upland longleaf pine communities. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected. Based upon this, the implementation of Alternative I will have **no impact** on this species.

Pinewoods bluestem (Andropogon arctatus)
This species is only found on the Conecuh National Forest, with less than 5 known locations documented. It is found on the transitional areas from longleaf pine to wet savannahs, bogs and flatwoods.

Pinewoods bluestem prefers a sunny, open savannah-like habitat transitioning into a bog. As a result of the ties to the bogs and wet savannahs this species has a moderately high to high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

The habitat is most effectively maintained by regular growing season burning, especially in the summer. Canopy openings and thinning are also likely to be beneficial as long as no rutting occurs, and activities are confined to strict oversight during the dry season. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Indian plantain (*Arnoglossum sulcatum*)
This is endemic to the southeastern gulf coastal plain bogs and wet pine savannahs. It is only found in the Florida panhandle, southwestern Georgia and southeastern Alabama. It is only found in a few sites on the Conecuh National Forest.

As a result of the ties to the bogs and wet savannahs, this species has a high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Scott's spleenwort (*Asplenium X ebenoides*)
This spleenwort has been found on dry sandstone outcrops and cliff sides on the Bankhead National Forest. It is known from only two locations. On the Bankhead, this falls within portions of the canyon corridor prescription, but certainly is covered within the rare community prescription. This species has a high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat.

Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Thistleleaf aster (Aster enyngiifolius)
This species is only found to be endemic to the southeastern gulf coastal plain bogs, lowlands, flatwoods, pine savannas and seeps. The specific habitat requirements apparently also include good exposure to light, constant hydrological flow and sandy-peat soils. This has only been reported from Covington County in Alabama.

As a result of it's rarity as well as the ties to the bogs and wet savannahs this species has a very high viability risk. Efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat potential for this species. Activities used to achieve this restoration may disturb individuals, which makes it critical to identify all individuals before project implementation. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and may prove to have beneficial effects over time.

Sandhills milkvetch (*Astragalus michauxii*)
The sandhills milkvetch is known from only a single location on the Conecuh National Forest. This species is ranked as an F1 on the Conecuh National Forest. This species tends to prefer open longleaf pine savannah and xeric sandyland habitats. It prefers open canopy, with little to no shrub competition.

There is a low to moderate likelihood of limitation to the species because of the habitat. In spite of this, and as a direct result of only a single known location, this species has a high viability risk. However, efforts to restore the longleaf pine and sandyland habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run.

Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species

Tennessee milkvetch (*Astragalus tennesseensis*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is highly probable that it could occur on the Bankhead National Forest (FP), since it has been found within one-quarter mile of the administrative boundary. This species is an Alabama endemic, often associated with glades and barrens where they overlap cedar glades or calcareous outcrops. It has been documented along the northern administrative boundary of the Bankhead. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species that have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species.

Spreading yellow false foxglove (*Aureolaria patula*)
This species has been reported from a single location on the Bankhead National Forest. It is found in Tennessee, Alabama and northwestern Georgia. Occurs in an open mature oak woodland setting.

This species has a moderately high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. It is very rare on the forest units, and high quality occurrences with large numbers of individuals are not known to occur.

Management actions may include some canopy gap creation, but for the most part, this species does well under full canopy. It does tolerate low fires. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Appalachian wild indigo (*Baptisia megacarpa*)
This species has been ranked as an F2 and has been found on the Oakmulgee, Tuskegee, and Conecuh units. This prefers moist shaded ravine slopes, streambanks, bluffs and rises in sandy bottoms. It is a SE coastal plain endemic, only found in southwest Georgia, north Florida and Alabama, which seems to be the center of the endemism.

It grows in light to deep shade, in fine sands or sandy loams; it is in sites that are rarely dry, receiving quite a bit of hydrological flow from the uplands, but neither do the sites commonly flood. It is normally associated with spring woodland forbs that require well-drained, moist substrates and disappear when the overstory is completely removed. It does not seem to tolerate disturbance or over-drying of the soils.

This species has a moderately high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Alabama grapefern (*Botrychium jenmanii*)
This species is moderately widespread across the southeast, but rare across its range (NatureServe 2003). On the National Forests in Alabama, it is known from 1 location. For the viability evaluation, it was given a Forest Rank of F1, meaning it is very rare, with 1-5 known occurrences.

The viability evaluation links this species with canopy gaps in moist woods, and open woodlands and grasslands on drier sites. Both of these conditions are less abundant now than they were historically due to dense regrowth of cutover forests near the turn of the century, and decades of fire suppression. Reasons for this species' rarity are not well understood (NatureServe 2003).

Efforts to restore canopy gaps in mature mesic forests, and woodlands, savannahs, and grasslands, as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Plan implementation is expected to have long-term beneficial effects to this species because many disturbance-dependent habitats will be restored, and adverse effects to known individuals will be avoided through project-level analysis. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Many-flowered grass pink (*Calopogon multiflorus*)
The many-flowered grass-pink is listed as an F1 on the Conecuh National Forest. It is strongly tied to bogs and seeps embedded within the coastal plain longleaf ecosystem. The blooming on these species are sometimes sporadic, and only lately have they been tied to blooming stimulation by November or December burns.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs and wet savannahs, this species has a high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Pale grasspink (*Calopogon pallidus*)
The pale grass-pink is listed as an F1 on the Conecuh National Forest. It is strongly tied to bogs and seeps embedded within the coastal plain longleaf ecosystem. The blooming on these species are sometimes sporadic, and only lately have they been tied to blooming stimulation by March/April burns.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs and wet savannahs, this species has a high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Bryson's sedge (*Carex brysonii*)
Bryson's sedge is currently known from 2 locations on the Bankhead National Forest. Endemic, with the only locations situated on the Bankhead. It occurs in rich alluvial deposits along the Sipsey river canyon, and embedded in the hemlock forest system. There is a very high viability risk associated with this species both due to the habitat limitations, lack of management options, and the relative scarcity of this species.

This species is associated with late-successional mature riparian habitat in canyons and rock cliffs. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Cypress-knee sedge (*Carex decomposita*)
This species occurs in a single location on the Oakmulgee, with potential to occur on the Conecuh National Forest. It can be found in cypress swamps and coastal plain ponds.

These habitats are listed as occurring in less than 1% of the landscape across Alabama, but with fairly even distribution throughout. Fire is normally either not a driving force in this system, or it is a rare occurrence. Most of these sites require little to no disturbance, and merely protection. Habitat for this species falls under the rare community and overlaps the riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Ravine sedge (*Carex impressinervia*)
Ravine sedge is currently known from less than 5 locations on the Oakmulgee unit. This species is associated with late-successional mature riparian habitat in basic mesic forest conditions. This species has a moderately high risk for viability loss, based on the fact that this species is also found in 3 other states, as well as the more abundant habitat distribution.

Habitat for this species falls under the rare community and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Kral's Indian paintbrush (*Castileja sp. nov. kraliana*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Oakmulgee and the Talladega National Forest (FP), since it has been found within the Choccolocco Mountain Longleaf Pine Wildlife Refuge, and the Oakmulgee contains potential critical habitat as well. This species is a mountain longleaf pine endemic that occurs within the ridgetop longleaf pine ecosystem. Habitat includes dry sandhills and montane longleaf pine communities. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provide guidance to survey for those species which have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species.

Florida jointtail grass (*Coelorachis tuberculosa*)
This species is ranked as an F1 on the Conecuh National Forest. This species tends to be a bit more general in its habitat preferences, ranging from bogs, seeps, wet pine flatwoods, streamsides, moist edges of coastal plain ponds, depressions and wet savannahs. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run.

Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Whorled horsebalm (*Collinsonia verticillata*)
This species has been found in only 3 locations on the Talladega National Forest. This prefers moist shaded hardwood slopes and rich soils. It is a southern Appalachian endemic, and Alabama seems to contain the southernmost population reported.

It grows in light to deep shade, in fine sands or sandy loams; it is in sites that are rarely dry, receiving a steady hydrological flow from the uplands, but neither do the sites commonly flood. It is normally associated with spring woodland forbs that require well-drained, moist substrates and disappear when the overstory is completely removed. It does not seem to tolerate disturbance or over-drying of the soils.

This species has a high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Alabama croton (*Croton alabamensis*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Oakmulgee unit (FP), since it has been found within one mile of the administrative boundary. This species is an Alabama endemic, often associated with glades and barrens where they overlap basic mesic oak forests on calcareous outcrops. It has been documented on the Bibb Glades and along the Cahaba River. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species which have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species.

Southern lady's slipper (*Cypripedium kentuckiense*)
This species has been ranked as an F1 and has been found on only a single location on the Oakmulgee units. This prefers moist shaded ravine slopes, streambanks, bluffs and rises in sandy bottoms.

It grows in light to deep shade, in fine sands or sandy loams; it is in sites that are rarely dry, receiving quite a bit of hydrological flow from the uplands, but neither do the sites commonly flood. It is normally associated with spring woodland forbs that require well-drained, moist substrates and disappear when the overstory is completely removed. It does not seem to tolerate disturbance or over-drying of the soils.

This species has a moderately high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Alabama larkspur (*Delphinium alabamicum*)
The Alabama larkspur is known from less than 5 locations on the Bankhead National Forest. It is primarily a plant associate of Glades, barrens and cedar woodlands. These are limestone or calcareous based communities.

There is a moderate likelihood of limitations intrinsic to the habitat that would act upon this species. In addition, this species is of extremely limited abundance and distribution, further increasing the viability risk. As a result, it is ranked very high for a viability risk, making it critical to undertake and complete habitat restoration whenever the opportunity presents itself. In addition, maintenance and protection of these habitats are also highly critical, but supported in the current forest plan alternative. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Riverbank bush honeysuckle (*Diervilla rivularis*)
This species has been ranked as an F2 and has been found on the Bankhead National Forest. This prefers moist shaded ravine slopes, streambanks, bluffs and rises in sandy bottoms.

It grows in light shade to open canopy on rocks or cliffs, including spray cliff conditions. It has been found on boulders in the center of the river course. The main requirement seems to be some light and constant water source.

This species has a moderately high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Mudbabies (Dwarf burhead) (*Echinodorus parvulus*)
Mudbabies occur in less than 5 locations on the Conecuh National Forest.
It can be found in cypress swamps, karst depressions and coastal plain/sinkhole ponds.

These habitats are listed as occurring in less than 1% of the landscape across Alabama, but with fairly even distribution throughout. Fire is normally either not a driving force in this system, or it is a rare occurrence. Most of these sites require little to no disturbance, and merely protection. Habitat for this species falls under the rare community and overlaps the riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Large Witchalder (*Fothergilla major*)
This species has been ranked as an F1 and has been found on the Oakmulgee and Talladega National Forest. It is a common associate with ridgetop and dry rocky longleaf pine forests, and open woodland savannah settings, often over sandstone. It is found only in Alabama, Tennessee and Georgia in the mountains and piedmont ecosystems.

The habitat plays a moderate role in limiting the viability of this species, currently at a high risk, while management can mitigate this effect by playing a critical role in restoring habitat.

Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Longleaf sunflower (*Helianthus longifolius*)
The longleaf sunflower occurs in a single location on the Talladega and a single location on the Oakmulgee. It is an associate with ridgetop and montane longleaf pine open woodland settings.

This is a species that occurs on glades and barrens, as well as rocky ridgetops. The habitat plays a moderate role in limiting the viability of this species, currently at a high risk, while management can mitigate this effect by playing a critical role in restoring habitat.

Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Smith sunflower (*Helianthus smithii*)

Smith's sunflower has now been located at 5 sites on the Talladega National Forest. It is an associate with ridgetop and montane longleaf pine settings.

This is a species that occurs on dry rocky ridgetops as well as mountain longleaf slopes. The habitat plays a moderate role in limiting the viability of this species, currently at a high risk, while management can mitigate this effect by playing a critical role in restoring habitat.

Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Harper's wild ginger (*Hexastylis shuttlesworthii var. harperi*)
This species has been found in only 3 locations on the Talladega National Forest. This prefers moist shaded hardwood slopes and rich soils. It is a southern Appalachian endemic, and Alabama seems to contain the southernmost population reported.

It grows in light to deep shade, in fine sands or sandy loams; it is in sites that are rarely dry, receiving a steady hydrological flow from the uplands, in rich mesic hardwoods. It is also associated with bogs and forested seeps.

This species has a high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Harper's heartleaf (*Hexastylis speciosa*)
This species is known from less than 5 locations on the Oakmulgee. It is found in transitions from bog to baygall habitat, in bays and seepages as well as partial shade of evergreen thickets. The soils are permanently wet.

This species is impacted by fires coming through the landscape. However, this appears to have only a temporary impact on the species, especially since the primary reproduction is vegetatively through root suckers. As a result of the rarity of its habitat, as well as it's high viability risk this species will need to be inventoried for protection of known sites during project planning.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Carolina spider lily (*Hymenocallis caroliniana*)
This species has been ranked as an F1 on the Oakmulgee, Bankhead and Talladega units. This prefers river corridors, sandbanks, cobbles, stream scours and riparian habitat.

It grows in light shade to open canopy on alluvial deposits and gravel. It has been found on boulders and cobbles in the center of the river course. The main requirement seems to be some light and constant water source.

This species has a moderately high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Taylor's filmy fern (*Hymenophyllum tayloriae*)
The Taylor's filmy-fern is another species that has been found in less than 5 locations on the Bankhead National forest and may be part of a disjunct population. It prefers shaded rock outcrops around streams and waterfalls, spray cliffs as well as mesic rock houses in canyons and rock gorges. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability.**

Alabama warbonnet *(Jamesianthus alabamensis*)
This species has been ranked as an F2 and has been found on the Oakmulgee, Talladega and Bankhead National Forest. This prefers moist shaded-to-partially-sunny riparian forests, alluvial deposits, basic mesic or circumneutral soils, streambanks, bluffs and rises in moist sandy bottoms.

This species has a moderately high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Butternut (*Juglans cinerea*)
This species has been ranked as an F1 and has been found on the Bankhead National Forest. This prefers moist shaded-to-partially-sunny riparian forests, alluvial deposits, basic mesic or circumneutral soils, streambanks, bluffs and rises in rich coves.

It grows in light shade to open canopy on rocks or cliffs, including spray cliff conditions and late successional riparian basic forests. The main requirement seems to be some light and constant water source.

This species has a high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Pineland bogbutton (*Lachnocaulon digynum*)
This species is currently rated as an F2 on the Conecuh National Forest. It occurs along sandy margins of coastal plain ponds, bogs, seeps, seasonal ponds, lakeshores or other exposed sandy areas of wetlands. This species is a gulf coastal plain endemic, and can be locally abundant within a single watershed.

As a result of the ties to the bogs, seeps and ponds, this species has a moderately high to high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Excessive mowing around lakeshores should be avoided, as this inhibits the production of seed. Areas should not be overplanted with trees as this disturbs the sunny open habitat requirements of this species. Regular burning at differing times of the year should prove beneficial in keeping the habitat open as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Alabama gladecress (*Leavenworthia alabamica var. alabamica*)
The Alabama gladecress is ranked as an F1 on the Bankhead National Forest. It is primarily a plant associate of glades, barrens and cedar woodlands. These are limestone or calcareous based communities.

There is a moderate likelihood of limitations intrinsic to the habitat that would act upon this species. In addition, this species is of extremely limited abundance and distribution, further increasing the viability risk. As a result, it is ranked very high for a viability risk, making it critical to undertake and complete habitat restoration whenever the opportunity presents itself. In addition, maintenance and protection of these habitats are also highly critical, but supported in the current forest plan alternative. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Duck river bladderpod (*Lesquerella densipila*)

The Duck river bladderpod is known from less than 5 locations on the Bankhead National Forest. It is primarily a plant associate of glades, barrens and cedar woodlands. These are limestone or calcareous based communities.

There is a moderate likelihood of limitations intrinsic to the habitat that would act upon this species. In addition, this species is of extremely limited abundance and distribution, further increasing the viability risk. As a result, it is ranked very high for a viability risk, making it critical to undertake and complete habitat restoration whenever the opportunity presents itself. In addition, maintenance and protection of these habitats are also highly critical, but supported in the current forest plan alternative. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Panhandle lily (*Lilium iridollae*)
This lily is found in fewer than 5 locations on the Conecuh National Forest. It is found only in Florida, Southwest Georgia and South Alabama. It prefers acidic soils of bogs, open wet pinelands, open edges of swamps, baygall transitional areas and streamsides within bogs.

As a result of the ties to the bogs and wet savannahs and poaching from illegal collections, this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Bog spicebush (*Lindera subcoriacea*)
This species is known from less than 5 locations on the Conecuh National Forest. It is found in transitions from bog to baygall habitat, in bays and seepages as well as partial shade of evergreen thickets. The soils are permanently wet.

This species is impacted by fires coming through the landscape. However, this appears to have only a temporary impact on the species, especially since the primary reproduction is vegetatively through root suckers. As a result of the rarity of its habitat, as well as it's high viability risk this species will need to be inventoried for protection of known sites during project planning.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Spring hill flax (*Linum macrocarpum*)
This flax is endemic to the south Alabama hillside bogs, seeps and wet savannahs, and has been found in only 2 locations on the Conecuh National Forest.

As a result of the ties to the bogs and wet savannahs and its extreme rarity, this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Fraser's yellow loosestrife (*Lysimachia fraseri*)
This species has been ranked as an F1 on the Talladega National Forest. This prefers river corridors, sandbanks, cobbles, stream scours and riparian habitat.

It grows in light shade to open canopy on alluvial deposits and gravel, streambanks, scours and first level terraces. It has been found on boulders and cobbles in the center of the river course. The main requirement seems to be some light and constant water source.

This species has a high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**

Flame flower (*Macranthera flammea*)
The orange bear tongue is a biennial species that is found to be endemic in the southeastern gulf coastal plain. It is found in less than 5 bogs on the Conecuh National Forest. It can be found on the lower edges of bogs next to streams, and transitioning into the baygalls and bayheads.

This species prefers the dynamic ecotone between the bog and baygall interface. As a result of the ties to the bogs and wet savannahs and it's relative scarcity on the landscape, this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular growing season burns are necessary to maintain the habitat and ensure that it continues to receive enough sunlight. In addition, the burning reduces competition that would otherwise be present from the baygall shrub associates. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Broadleaf Barbara's buttons (*Marshallia trinervia*)
This species is ranked as an F1 on the Talladega and Bankhead National Forests. This species tends to require bogs, seeps, and streamsides. It prefers a somewhat open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the scarcity of the species itself; this species has a very high viability risk. However, efforts to restore and maintain bog and seepage habitat as well as streamside habitat elements as provided in the revised plan should provide increased habitat for this species.

Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Alabama sandwort (*Minuartia alabamensis*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Bankhead National Forest (FP), since it has been found within one mile of the administrative boundary. This species is an Alabama endemic, often associated with glades and barrens and rock outcrops. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species that have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species.

Sweet pinesap (*Monotropsis odorata*)
The sweet pinesap is rated as an F1 on the Bankhead National Forest and has the potential to occur on the Oakmulgee. It has been cited as an associate of mature southern yellow pine forests, and open woodland or savannah settings. Additional habitat has been described as open mature oak woodlands, with a pine component.

The habitat plays a moderate to low role in limiting the viability of this species, currently at a high risk, while management can mitigate this effect by playing a critical role in restoring habitat.

Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Loose water milfoil (*Myriophyllum laxum*)
This species is a southeastern gulf coastal plain endemic that requires forested shallow still waters that is acidic. As a result it is found in coastal plain ponds, fens, wet pine savannahs and flatwoods, forested lakeshores and swamps. This species has only been found in 3 locations on the Conecuh National Forest, and has a high to very high risk of loss of viability.

These habitats are listed as occurring in less than 1% of the landscape across Alabama, but with fairly even distribution throughout. Fire is normally either not a driving force in this system, or it is a rare occurrence. Most of these sites require little to no disturbance, and merely protection. Habitat for this species falls under the rare community and overlaps the riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Alabama snow-wreath (*Neviusia alabamensis*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Bankhead National Forest, Talladega National Forest and the Oakmulgee unit (FP), since it has been found close to the administrative boundaries of all three units. This species is an Alabama endemic that requires canopy gaps in basic mesic forests and in late successional riparian forests. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species that have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species.

Naked-stemmed panic grass (*Panicum nudicaule*)
There are more than five known locations of this species on the Conecuh National Forest. It is a Florida panhandle endemic that can be found in bogs, flatwoods and wet pine savannas.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs and wet savannahs, this species has a moderately high/high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Climbing fetterbush (*Pieris phillyreifolia*)
The Climbing heath has the rank of F2 on the Conecuh National Forest. It is the only climbing vine in the heath family in the southern region. It forms a woody evergreen vine and is found ascending swamp-dwelling trees, usually Pond cypress, by creeping up the bark. It can be found in cypress swamps, karst depressions and coastal plain/sinkhole ponds.

These habitats are listed as occurring in less than 1% of the landscape across Alabama, but with fairly even distribution throughout. Fire is normally either not a driving force in this system, or it is a rare occurrence. Most of these sites require little to no disturbance, and merely protection. Habitat for this species falls under the rare community and overlaps the riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Chapman's butterwort (*Pinguicula planifolia*)
This species is found to be endemic in the panhandle of Florida, southern Alabama and southeastern Mississippi in very wet portions of bogs, wet ditches, low flooded swales, and soggy areas at the transitional edges of swamps. It is also often found in habitats that flood for part of the year. It can be found only rarely on the Conecuh National Forest.

As a result of the ties to the bogs and wet savannahs and poaching from illegal collections, this species has a high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Southern butterwort (*Pinguicula primuliflora*)

This species is endemic in the panhandle of Florida, southern Alabama and southeastern Mississippi, always associated with small streams, rills, or areas where some flow occasionally occurs. It can be locally abundant at the edges of boggy streams, where it occurs on the Conecuh National Forest.

Between the ties to the bogs and wet savannahs and poaching from illegal collections, this species has a high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Coastal-plain golden-aster (*Pityopsis oligantha*)
The Coastal plain golden aster is listed as an F1 on the Conecuh National Forest. It is, as the name implies, a coastal plain endemic that can be found on the upper ends of bogs and seeps, transitioning to the upland longleaf pine communities.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs and wet savannahs, this species has a high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Pineland plantain (*Plantago sparsiflora*)
The pineland plantain is listed as an F1 on the Talladega National Forests. A southern Appalachian endemic, it is an associate with ridgetop and dry rocky mountain longleaf pine forests, and open woodland or savannah settings.

It occurs on dry sandy soils, rocky slopes and in moderately open stands. The habitat plays a moderate role in limiting the viability of this species, currently at a high risk, while management can mitigate this effect by playing a critical role in restoring habitat.
Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and

protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Yellow fringeless orchid (*Platanthera integra*)
This species is endemic to the gulf coastal plain bogs, seeps, wet meadows and savannahs. There are less than 5 known locations for this on the Conecuh National Forest. Blooming is also periodic, and does not seem to be directly tied to management actions or inactions. It prefers open sunny habitat, although it does seem to tolerate shading, and sometimes occurs in the transition to the baygall habitat.

As a result of the ties to the bogs and wet savannahs and poaching from illegal collections, this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular growing season burning alternating with year-round seasonal burning should combine the best methods for keeping the habitat open and relatively shrub-free. Thinning and canopy removal should prove beneficial if these are done with strict oversight during the dry season to avoid compaction and rutting of the soils. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Hooker's milkwort (*Polygala hookeri*)
This species is listed as an F1 on the Conecuh National Forest. It is endemic to the southeastern coastal plain and Alabama in particular. It can be found in the wetter portions of bogs and seeps and wet pine flatwoods and savannahs.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs and wet savannahs; this species has a high or very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Tennessee Leafcup (*Polymnia laevigata*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Bankhead National Forest (FP), since it has been found close to the administrative boundary. This species has been associated with glades and barrens, open oak woodlands, open ridgetops and rock outcrops. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species that have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species.

Arkansas oak (*Quercus arkansana*)
The Arkansas Oak is rated as an F2 on the Oakmulgee district. It is a common associate with ridgetop and dry rocky longleaf pine forests, and open woodland savannah settings. It is found only in the upper gulf coastal plains, often at the fall line or transition to a more northern ecoregion.

It occurs on dry sandy soils, rocky slopes and around small drainheads. It is also surprisingly shade tolerant to some degree. The habitat plays a moderate role in limiting the viability of this species, currently at a high risk, while management can mitigate this effect by playing a critical role in restoring habitat.

Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Panhandle meadowbeauty (*Rhexia salicifolia*)
This species has only a single known occurrence on the Conecuh National Forest and in Alabama. It is restricted to the limey shores of sinkhole ponds or in poorly drained flatwoods, and may be found in conjunction with Kral's yellow-eyed grass. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Orange azalea (*Rhododendron austrinum*)
This species is listed as an F2 on the Conecuh National Forest. It grows in the poorly drained flatwoods, alluvial river terraces and flood plains on sandy acid soils.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs and wet savannahs; this species has a moderately high viability risk. However, efforts to restore wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Hairy peduncled beakrush (*Rhynchospora crinipes*)
This species is ranked as an F1 on the Conecuh National Forest. This species tends to be a bit more general in its habitat preferences, ranging from bogs, seeps, wet pine flatwoods, streamsides, moist edges of coastal plain ponds, depressions and wet savannahs. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Large beakrush (*Rhynchospora macra*)
The large beakrush is a F1 species in bogs on the Conecuh National Forest. This species is specifically tied with bogs and embedded hillside seepage communities in the coastal plain.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs and wet savannahs; this species has a high or very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Coastal beaksedge (*Rhynchospora pleiantha*)
The Coastal beaksedge is an F1 on the Conecuh National Forest. It is associated with open wetlands and pond margins of sinkhole ponds located within wet savannahs and flatwoods. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Thorne’s beaksedge (*Rhynchospora thornei*)
Thorne’s beaksedge has been reported as an F1 for both the Conecuh and the Oakmulgee units. In each case, it has been associated with a seepage bog or pond margin, with open sunny conditions.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Clammy locust (*Robinia viscosa*)

The clammy locust is rated as an F1 on the Talladega and Bankhead National Forests. A southern Appalachian endemic, it is an associate with ridgetop and dry rocky mountain longleaf pine forests, and open woodland or savannah settings.

It occurs on dry sandy soils, rocky slopes and around small drainheads. It is also surprisingly shade tolerant to some degree. The habitat plays a moderate role in limiting the viability of this species, currently at a high risk, while management can mitigate this effect by playing a critical role in restoring habitat.

Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Eared coneflower (*Rudbeckia auriculata*)

This species has been ranked as an F1 and has been found on the Oakmulgee and Talladega National Forest. This prefers moist shaded-to-partially-sunny riparian forests, alluvial deposits, river corridors and streambanks.

It grows in light shade to open canopy on rocks or cobbles, even in the middle of the stream course. The main requirement seems to be some light and constant water source.

This species has a high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Sun-facing coneflower (*Rudbeckia heliopsidis*)
This species is rated as an F2 on the Tuskegee National Forest. It is an associate with longleaf pine forests, and open woodland or savannah settings as well as open early successional forest settings.

It occurs on dry sandy soils, slopes and in moderately open stands. The habitat plays a moderate to low role in limiting the viability of this species, currently at a high risk due to it's lack of relative abundance, while management can mitigate this effect by playing a critical role in restoring habitat.

Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Pinnate-lobed black-eye Susan (*Rudbeckia triloba var pinnatiloba*)
This species has been ranked as an F1 on the Talladega National Forest. This prefers moist shaded hardwood slopes and rich soils as well as the overlap into the late successional riparian forests.

It grows in light to deep shade, in fine sands or sandy loams; it is in sites that are rarely dry, receiving a steady hydrological flow from the uplands, but neither do the sites commonly flood. It is normally associated with spring woodland forbs that require well-drained, moist substrates and disappear when the overstory is completely removed. It does not seem to tolerate disturbance or over-drying of the soils.

This species has a high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Night flowering Ruellia (*Ruellia noctiflora*)

There are currently less than 3 known sites of this plant on the Conecuh National Forest. The night-flowering Ruellia only flowers at night, although blooms may still be visible early in the morning. This plant prefers wiregrass bogs and open savannas, transitioning up to dryer sites in the upland longleaf pine communities.

This species has a high to very high viability risk, mainly due to the low abundance. Even the known sites contain fewer than 4 individuals. It prefers open canopy, with little to no shrub competition. Efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Appalachian rose gentian (*Sabatia capitata*)

The Appalachian rose gentian is rated as an F2 on the Talladega National Forests. A southern Appalachian endemic, it is an associate with ridgetop and dry rocky mountain longleaf pine forests, and open woodland or savannah settings.

It occurs on dry sandy soils, rocky slopes and in moderately open stands. The habitat plays a moderate role in limiting the viability of this species, currently at a high risk, while management can mitigate this effect by playing a critical role in restoring habitat.

Regular use of fire and canopy removal should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

White-topped pitcherplant (*Sarracenia leucophylla*)

This pitcherplant is found in southwestern Georgia, through the Florida Panhandle and southern Alabama to southeastern Mississippi, with Alabama at the center of the endemism. This species only occurs on the Conecuh National Forest in bogs and wet savannas. It is found throughout the forest in high-quality bog habitat.

Between the ties to the bogs and wet savannahs and poaching from illegal collections, this species has a high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration efforts may prove to have beneficial effects on this species.

Wherry's pitcherplant (*Sarracenia rubra ssp. wherryi*)
This pitcher plant grows up to 14 inches tall, with reddish veins on the green pitcher. The main species is found from central coastal North Carolina south to Georgia and west to southeastern Mississippi. However, this has been identified at only a few locations on the Conecuh National Forest. It is extremely rare.

One complicating factor is that several subspecies of the red pitcher plant have been described by numerous botanists. The subspecies in Conecuh National Forest has been identified as Wherry's, but other red pitcher plants have subsequently been identified as the Gulf red pitcher plant. In no case are the species found at more than 5 sites throughout the forest.

Between the ties to the bogs and wet savannahs and poaching from illegal collections, this species has a high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its extreme rarity, identification and protection of known sites during project planning is important for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability** and restoration efforts may prove to have beneficial effects on this species.

Bay starvine (*Schisandra glabra*)
This species has been ranked as an F1 on the Oakmulgee. This prefers moist shaded hardwood slopes and rich soils as well as the overlap into the late successional riparian forests.

It grows in light to deep shade, in fine sands or sandy loams; it is in sites that are rarely dry, receiving a steady hydrological flow from the uplands, but neither do the sites commonly flood. It is normally associated with spring woodland forbs that require well-drained, moist substrates and disappear when the overstory is completely removed. It does not seem to tolerate disturbance or over-drying of the soils.

This species has a high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Alabama skullcap (*Scutellaria alabamensis*)
This species has been ranked as an F1 on the Talladega National Forest and has the potential to occur on the Bankhead National Forest. This prefers moist shaded hardwood slopes and rich soils.

It grows in light to deep shade, in fine sands or sandy loams; it is in sites that are rarely dry, receiving a steady hydrological flow from the uplands, but neither do the sites commonly flood. It is normally associated with spring woodland forbs that require well-drained, moist substrates and disappear when the overstory is completely removed. It does not seem to tolerate disturbance or over-drying of the soils.

This species has a high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Nevius' stonecrop (*Sedum nevii*)
This species has been ranked as an F1 and has been found on the Talladega and Bankhead National Forests, with potential to occur on the Oakmulgee. This prefers moist shaded-to-partially-sunny riparian forests, alluvial deposits, basic mesic or circumneutral soils, streambanks, bluffs and rises in rich coves.

It grows in light shade to open canopy on rocks or cliffs, including spray cliff conditions, dry calcareous waterfall areas, boulders in the middle of the stream course and late successional riparian basic forests. The main requirement seems to be some light and constant water source.

This species has a high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Blue Ridge catchfly (*Silene ovata*)
This species has been ranked as an F1 on the Bankhead National Forest. This prefers moist shaded hardwood slopes and rich soils as well as the overlap into the late successional riparian forests.

It grows in light to deep shade, in fine sands or sandy loams; it is in sites that are rarely dry, receiving a steady hydrological flow from the uplands, but neither do the sites commonly flood.

It is normally associated with spring woodland forbs that require well-drained, moist substrates and disappear when the overstory is completely removed. It does not seem to tolerate disturbance or over-drying of the soils.

This species has a high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Royal catchfly (*Silene regia*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Oakmulgee, Talladega or Bankhead National Forest (FP), since it has been found nearby each of the administrative boundaries. This species is often associated with glades and barrens, mature open woods and woodlands and forested grasslands. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species that have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species

Pineland dropseed (*Sporobolus curtisii*)
This species is ranked as an F1 on the Conecuh National Forest. This species tends to be a bit more general in its habitat preferences, ranging from bogs, seeps, wet pine flatwoods, to upland longleaf pine. It prefers open canopy, with little to no shrub competition.

There is a moderate likelihood of limitation to the species because of the habitat however, this species has a high viability risk due to the scarcity of the species, rather than the habitat. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Florida dropseed (*Sporobolus floridanus*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Conecuh National Forest (FP), since it has been found within one mile of the administrative boundary. This species is a Florida panhandle endemic, and often found in transitions from upland longleaf pine to wet savannas and flatwoods. Forest

Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species that have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species

Limestone fameflower (*Talinum calcaricum*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Bankhead National Forest (FP), since it has been found within one mile of the administrative boundary. This species is an Alabama endemic, often associated with calcareous glades and barrens and rock outcrops. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species that have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impactt** on this species
FP Bankhead

Menge's fameflower (*Talinum mengesii*)
The Menge's fameflower is known from less than 5 locations on the Bankhead National Forest. It is primarily a plant associate of glades, barrens and cedar woodlands.

There is a moderate likelihood of limitations intrinsic to the habitat that would act upon this species. In addition, this species is of extremely limited abundance and distribution, further increasing the viability risk. As a result, it is ranked very high for a viability risk, making it critical to undertake and complete habitat restoration whenever the opportunity presents itself. In addition, maintenance and protection of these habitats are also highly critical, but supported in the current forest plan alternative. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Pineland hoarypea (*Tephrosia mohrii*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Conecuh National Forest (FP), since it has been found just inside the administrative boundary, although on private land. This species is a Florida panhandle endemic, and often found in transitions from upland longleaf pine to dry sandylands and xeric oak/prickly pear habitat. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species that have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species

Piedmont Meadowrue (*Thalictrum macrostylum = T. subrotundum*)
This species has been ranked as an F1 on the Talladega National Forest. This prefers moist shaded hardwood slopes and rich soils. It is also associated with late successional riparian

habitat. It is a southern Appalachian endemic, and Alabama seems to contain the southernmost population reported.

It grows in light to deep shade, in fine sands or sandy loams; it is in sites that are rarely dry, receiving a steady hydrological flow from the uplands, but neither do the sites commonly flood. It is normally associated with spring woodland forbs that require well-drained, moist substrates and disappear when the overstory is completely removed. It does not seem to tolerate disturbance or over-drying of the soils.

This species has a high viability risk, due primarily to the scarcity on the landscape rather than any limiting factors inherently present in the habitat. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Little mountain Meadowrue (*Thalictrum mirabile*)
This is another species that has been found in less than 20 locations on the Bankhead National forest and may be part of a disjunct population. It prefers shaded rock outcrops around streams and waterfalls, spray cliffs as well as mesic rock houses in canyons and rock gorges. Habitat for this species falls under the canyon corridor and riparian prescriptions that will minimize potential negative effects from management at the programmatic level. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**

Cutleaved meadow parsnip (*Thaspium pinnatifidum*)
The Cutleaved meadow parsnip is ranked as an F1 on the Bankhead National Forest. It is primarily a plant associate of glades and barrens and woodlands savannas and grasslands, a subset being cedar woodlands. These are limestone or calcareous based communities.

There is a moderate likelihood of limitations intrinsic to the habitat that would act upon this species. In addition, this species is of extremely limited abundance and distribution, further increasing the viability risk. As a result, it is ranked high for a viability risk, making it critical to undertake and complete habitat restoration whenever the opportunity presents itself. In addition, maintenance and protection of these habitats are also highly critical, but supported in the current forest plan alternative. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Smooth tofieldia (*Tofieldia glabra*) is not currently known from any locations on the National Forests in Alabama, though based upon the species' rangewide distribution it is possible that it could occur on the Conecuh National Forest (FP), since it has been found close to the administrative boundary. This species is a Florida panhandle endemic, and often found in bogs and seeps as well as wet savannas and flatwoods. Forest Wide Standards state that individuals needed to maintain viability of a species within the planning area would be protected and the FSM provides guidance to survey for those species that have a high probability of occurrence on the units. Based upon this, the implementation of Alternative I will have **no impact** on this species

Carolina fluffgrass (*Tridens carolinianus*)
This species is ranked as an F1 on the Conecuh National Forest. This species tends to be a bit more general in its habitat preferences, ranging from bogs, seeps, wet pine flatwoods, streamsides, moist edges of coastal plain ponds, depressions and wet savannahs. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Lanceleaf trillium (*Trillium lancifolium*)
This species has been ranked as an F2 and has been found on the Oakmulgee, Talladega and Bankhead National Forest. This prefers moist shaded-to-partially-sunny riparian forests, alluvial deposits, basic mesic or circumneutral soils, streambanks, bluffs and rises in moist sandy bottoms.

This species has a moderately high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. However, most of the occurrences should fall within the riparian prescription, as well as the rare community prescriptions. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Southern nodding trillium (*Trillium rugelii*)
This species has been ranked as an F1 and has been found only on the Talladega National Forest. This prefers moist shaded-to-partially-sunny riparian forests, alluvial deposits, basic mesic or circumneutral soils, streambanks, bluffs and rises in moist sandy bottoms.

This species has a very high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. However, most of the occurrences should fall within the riparian prescription, as well as the rare community prescriptions. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Jeweled trillium (*Trillium simile*)
This species has been ranked as an F1 and has been found only on the Bankhead National Forest. This prefers moist shaded-to-partially-sunny riparian forests, alluvial deposits, basic mesic or circumneutral soils, streambanks, bluffs and rises in moist sandy bottoms.

This species has a very high viability risk, due primarily to the scarcity on the landscape as well as limiting factors inherently present in the habitat. However, most of the occurrences should fall within the riparian prescription, as well as the rare community prescriptions. Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**.

Chapman's yellow-eyed grass (*Xyris chapmanii*)
Chapman's yellow-eyed grass is listed as an F1 on the Conecuh National Forest. It is one of two that prefers bogs and wet pine flatwoods instead of sinkhole pond margins. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Drummond's yellow-eyed grass (*Xyris drummondii*)
This species is ranked as an F2 on the Conecuh National Forest. Drummond's yellow-eyed grass is found in high quality bogs, seasonal pond margins, wet poorly drained areas of flatwoods, and related moist habitats within the gulf coastal plain. In some intact watersheds it has been found to be locally abundant. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Quillwort yellow-eyed grass (*Xyris isoetifolia*)
This species has only a single known occurrence on the Conecuh National Forest and in Alabama. It is restricted to the sandy shores of sinkhole ponds or in poorly drained flatwoods. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Kral's yellow-eyed grass (*Xyris longisepala*)
Kral's yellow-eyed grass has less than 5 known locations documented on the Conecuh National Forest. It prefers moist sandy shores of limestone/sinkhole ponds where it often occurs with the panhandle meadowbeauty. It becomes most abundant during periods of low water when seeds deposited germinate. The flowers unfold a midday, a key identifying characteristic. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Louisiana yellow-eyed grass (*Xyris louisianica*)
This is the other yellow-eyed grass that prefers bogs and wet pine savannahs. There are less than 3 known occurrences of this species on the Conecuh National Forest. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

Harper's yellow-eyed grass (*Xyris scabrifolia*)
This species is ranked as an F1 on the Conecuh National Forest. This species tends to be a bit more general in its habitat preferences, ranging from bogs, seeps, wet pine flatwoods, streamsides, moist edges of coastal plain ponds, depressions and wet savannahs. It prefers open canopy, with little to no shrub competition.

There is a high likelihood of limitation to the species because of the habitat and as a result of the ties to the bogs, coastal plain ponds and wet savannahs; this species has a very high viability risk. However, efforts to restore bog and wet savannah habitat as provided in the revised plan should provide increased habitat for this species.

Regular use of fire should prove beneficial to this species as well. Activities used to achieve this restoration may disturb individuals in the short run, but improve conditions in the long run. Because of its rarity, it is critical that proper identification and protection of known sites during project planning is completed for providing opportunities for population expansion.

Based upon this, the implementation of Alternative I **may impact individuals but is not likely to cause a trend toward federal listing or loss of viability**, and restoration management efforts may prove to have beneficial effects on this species.

VII.C. SENSITIVE AQUATIC ANIMALS

Within the National Forests in Alabama, aquatic species compose 38% of the Regional Forester's sensitive species (USFS 2002). There are 68 sensitive aquatic species including 23 insects, 21 fish, 18 mussels, three crayfish, two reptiles, and one amphibian. Two species on the Regional Forester's sensitive species list (Southern hickory nut and a caddisfly, *Rhyacophila carolae*) are unlikely to be found on the National Forests in Alabama and are thus not discussed in detail within this assessment.

In addition to the 25 federally listed aquatic species associated with the National Forests in Alabama (USFS 2003a), there are five aquatic species considered as candidates for future listing (USFWS 2000a). These candidate species are included within the 68 aquatic species currently on the Regional Forester's sensitive species list. Two candidate mussels (Georgia pigtoe and Alabama clubshell) are thought to be historical at locations on or near the National Forests in Alabama (USFWS 2000a). Both species may be extirpated from the watersheds of the National Forests in Alabama, and Georgia pigtoes may be extirpated from the State.

General Potential Management Effects – In general, Forest Service management activities that could influence aquatic species would include actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, elevate temperatures, remove or alter streamside vegetation, or limit large woody debris. In some cases, direct effects of mechanical damage or mortality could also be within the realm of possibility. However, the Forest-wide, riparian, and streamside management zone standards of the revised Forest Plan will minimize, if not avoid, all of these potential effects.

For example, the revised Forest Plan contains numerous standards that will protect against sediment release during such management activities as prescribed burning, silviculture, or road and trail construction and maintenance. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning. However, such effects would be minimized to the extent that they would be cumulatively insignificant, especially when coupled with proactive restoration goals and objectives, and given the development and consideration of aquatic species and habitat conservation strategies. Also, increasing emphasis on upland and riparian forest health restoration would eventually lead to decreased background levels of sediments from erosion, a benefit to sediment sensitive aquatic species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed restoration and consequently provide protection against adverse alterations in flow. Cumulatively there could be some alteration in run-off and hydrology due to watershed wide patterns of land use. However, under the proposed actions of the revised Forest Plan, flow-altering land uses are expected to be moderated, and on-Forest watershed conditions would continue to improve from historic conditions. The revised Forest Plan stipulates the use of protective measures and limitations on the extent and methods of vegetative removal, road and facility construction and maintenance, and soil compaction (numerous Forest-wide and watershed standards and objectives). Forest Service activities would therefore have minimal negative effects on the magnitude and duration of flood flows. Proposed actions also would have negligible effects on base levels of stream flow. Under the proposed action, all Forest Service facilities will eventually be switched over to municipal water supplies. There would be no surface water extraction and minimal ground water use. Reservoirs may either benefit or negatively affect aquatic species by increasing or decreasing the amount and duration of base flows. However, all of the impoundments associated with these species are operated by other agencies for municipal water supplies or flood control and therefore not under the management of the U.S. Forest Service.

Full implementation of the revised Forest Plan would minimize the potential for chemical contamination from Forest Service roads, equipment, and herbicide and pesticide use. Measures will also be in place to avoid chemical contamination from mines and oil and gas operations. Proposed actions will include protective measures for lake fertilization activities, thus limiting the potential for adversely altering downstream water chemistry or nutrient levels. Also, revised Forest Plan standards would minimize the potential for eutrophication by limiting concentrated equestrian and livestock use within sensitive riparian areas.

The proposed actions will have minimal and eventually fully mitigated effects on stream channel structure due to standards of action applied to road and trail construction, maintenance, removal, and monitoring (USFS 2003a). Road stream crossings have the potential to indirectly affect aquatic species due to the limitations on the dispersion (Watters 1996). However, roads are less likely to hamper movements of species that reside in larger mainstream habitat of the lower portions of the watersheds. Within these areas, bridges are in place to span the larger stream channels. But it is possible that road stream crossings within the upper tributaries are potential barriers for many aquatic species and it is not yet clear how population viability may or may not be tied to habitat availability throughout the watershed. Proposed actions include assessment of road and trail crossings for fish passage, which will be followed up with restoration of passage according to conservation strategy priorities and available funding. Cumulatively, in most watersheds and for many aquatic species, the largest ongoing impact will continue to be from reservoirs downstream and on in-holdings within Forest Service boundaries. All but one of these reservoirs are operated by municipalities and other agencies without possibility of Forest Service intervention. The Brushy Lake Reservoir on the Bankhead National Forest is small and located within the upper watershed. At this time, it is not clear if this facility contributes to habitat fragmentation.

Forest Plan direction limits the removal of streamside vegetation to only those circumstances where it is necessary for pest control, public safety, or restoration of riparian dependant resources. New canopy openings may be created within riparian areas, but only for the restoration or enhancement of riparian dependant species. Silvicultural and prescribed burning techniques may be utilized within riparian areas in order to achieve the objective of up to 10%

of riparian areas in a non-forested condition and an additional 1-2% of riparian areas maintained as early successional forests.

Direct effects, such as mortality of juveniles or adults, are not expected to occur as a result of the proposed actions under the revised Forest Plan. Direction in the revised Forest Plan will continue the current situation of limited Forest Service roads and motorized trails within the riparian and streamside management zones. Revised Forest Plan standards will minimize opportunities for mechanical damage due to vehicles or heavy equipment.

Implementation of protective standards will be monitored and adjusted as needed. Where needed to protect these species from potential adverse effects of management activities, project-level surveys would be conducted in accordance with procedures outlined in the Southern Region supplement of the Forest Service Manual (FSM 2672). Consequently, application of Forest Plan standards would minimize programmatic and project level effects and consideration of watershed restoration and species conservation priorities within project level planning would further minimize the likelihood of multiple and concurrent actions causing significant cumulative effects.

The revised Forest Plan provides opportunities for proactive habitat restoration and aquatic species protection through consolidation of Forest ownership, contributions to recovery and conservation, participation in population and habitat enhancements and restoration, and commitment to ongoing surveys and monitoring. Forest-wide standards and prescribed levels of activities would continue progress towards watershed, riparian corridor, and aquatic habitat restoration. Watershed restoration will lead to long-term reductions in erosion and sediment run-off into aquatic habitats. Restoration of riparian corridors will generally lead to reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. Increasing emphasis on habitat restoration and removal of barriers to aquatic species movements will be afforded through implementation of revised Forest Plan goals and objectives. Formulation and implementation of aquatic conservation strategies will assist in focusing inventory, research, restoration and monitoring efforts. Revised Plan direction aims to foster participation in cooperative watershed assessments, planning, and restoration. Moreover, there are goals and objectives encouraging Forest Service leadership in natural resource education. Therefore, Plan implementation should be of benefit to the population viability of most aquatic species.

Species-specific effects are discussed in greater detail in the following sections organized alphabetically by scientific name within each of the major aquatic species taxonomic groups (amphibians, reptiles, fish, crayfish, mussels, snails, insects).

Black Warrior waterdog (*Necturus alabamensis)*

Distribution, Status, and Trend—The Black Warrior waterdog is a candidate for possible future federal listing. Globally the species is ranked as imperiled (G2); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003). It is considered at risk of population decline. This species has been identified as a priority 2 species of high concern (i.e. "imperiled") within the State of Alabama (ADCNR 2003).

This species is endemic to the upper Black Warrior River system in Alabama. Currently, the species is known or suspected to inhabit four watersheds associated with the Bankhead National Forest (Table C.1). Black Warrior waterdogs are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 40 percent of the species' range within the State of Alabama. Within the Bankhead National Forest, Black Warrior waterdogs are scattered in distribution and locally rare in abundance. Highest densities have been documented in Brushy Creek.

Table C.1. Conditions of watersheds potentially supporting Black Warrior waterdogs in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	**HUC code**	**Watershed**	**% FS**	**% ag**	**%urban**	**Road Density**	**Rating[1]**	**Status[2]**	**Rank[3]**	**Risk[4]**
Bankhead	3160110010	U. Sipsey Fork	87	1		L	E	L	F2	
	3160110020	L. Sipsey Fork	32	7	1	M	E	L		F
	3160110030	U. Brushy	82	2		L	E	L		
	3160110040	L. Brushy	36	6		M	E	L		F

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Black Warrior waterdogs primarily inhabit moderate currents over clay-sand and cobble-boulder substrates along the margins of medium to large wide and shallow streams (NatureServe 2003). This species is found in greatest abundance in association with large woody debris and cobble or boulders (NatureServe 2003). They appear to require detectable flow and ample leaf packs for cover and foraging. Other factors contributing to habitat suitability include a low silt load and substrate deposits, low nutrient content and bacterial counts, moderate temperatures, and minimal overall chemical pollution. Black Warrior waterdogs are thus considered to be sensitive to siltation, water temperature, point source pollution, altered flows, loss of large woody debris, or changes in riparian vegetation.

The historic decline of Black Warrior waterdog populations may be attributed to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of four possible watersheds show no indication of potential impairment (Table C.1). The other two watersheds exhibit combinations of indicators of potential impairment for water flow, with limited opportunities for National Forest management to improve conditions. All watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Black Warrior waterdogs include any actions that could increase sedimentation,

siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, elevate temperatures, decrease large woody debris, or alter streamside canopy and late-successional riparian forests. Siltation may affect this species by burying leaf packs where they seek food and cover, reducing the availability of oxygen, and accumulating toxic chemicals and pathogens that are detrimental to their individual and reproductive health. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for late-successional riparian habitats important to this species. According to the terrestrial viability assessment (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain “moderately high”, regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore,
Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Moreover, the Upper and Lower Sipsey Forks are important watersheds for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. Although the watersheds thought to harbor this species are rated as in “excellent” condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Black Warrior waterdog** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Escambia map turtle (*Graptemys ernsti*)

Distribution, Status, and Trend—Globally the species is ranked as “imperiled” (G2); within Alabama, the species is ranked as “imperiled” (S2) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

The Escambia map turtle is endemic to the Pensacola Bay River basin, including the Yellow, Escambia, and Conecuh Rivers in Alabama (Ernst et al. 1994). Currently, the species potentially inhabits seven watersheds associated with the Conecuh National Forest (Table C.2). Escambia map turtles are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 20 percent of the species’ range within the State of Alabama. Escambia map turtles are endemic and limited in their distribution. When encountered, they are usually common and in moderate abundance.

Table C.2. Conditions of watersheds potentially supporting Escambia map turtle in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[1]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	C	F3	S
	3140103070	Yellow-Watkins	14	21	1	M	E	C		S
	3140103080	Five Runs	21	34	5	M	E	C		
	3140103090	Yellow-Givens	12	21	1	L	E	C		S
	3140104010	Blackwater	49	13	3	L	E	C		
	3140301050	U. Conecuh	3	23	3	M	E	C		S
	3140304010	L. Conecuh	4	9	3	L	E	C		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Escambia map turtles primarily inhabit swift currents over sand and gravel substrates within large streams and various sized rivers (Wilson 1995). This species is found in greatest abundance in association with large basking logs and ample molluscan prey (Mount 1996). Escambia map turtles are thus considered to be sensitive to siltation, point source pollution, altered flows, and loss of large woody debris or late successional riparian forests. According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of seven possible watersheds show no indication of potential impairment (Table C.2). The other five watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as “average” in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Escambia map turtles include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for late successional riparian habitats important to this species. According to the terrestrial viability assessment (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "low", regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the upper Yellow River watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow River watersheds where excessive siltation has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Escambia map turtle** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Alabama shad (*Alosa alabamae*) -- Candidate

Distribution, Status, and Trend—Anadromous populations of Alabama shad are a candidate for federal listing (NMFS 1997) and are considered at risk of population decline ("vulnerable") according to Warren et al. (2000). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 2 species of high concern (i.e. "imperiled") within the State of Alabama (ADCNR 2003).

Historically, Alabama shad inhabited most coastal drainages from the Mississippi River east to the Suwannee River (Ross 2001). Within Alabama, this species occurred below the fall line in the upper and lower Tombigbee, Black Warrior, Cahaba, Alabama, and Mobile-Tensaw drainages (Mettee et al. 1989). Currently, Alabama shad are considered extirpated from the Tombigbee River and are greatly limited to three areas within Alabama in the Conecuh, Choctawhatchee, and Alabama Rivers (Mettee et al. 1989). Individuals occur in the Alabama River below Claiborne and Millers Ferry dams, and they still regularly enter and move up into the Conecuh and Choctawhatchee river systems to spawn. Shad are therefore a possible inhabitant of sections of the Conecuh River downstream from the tributaries of the Conecuh National Forest (Table C.3). They are historic on the Oakmulgee Division of the Talladega National Forest. Alabama shads also may occur on the DeSoto National Forest in Mississippi and the Appalachicola National Forest in Florida. The National Forests represent less than 5% percent of the species' range within the State of Alabama. Alabama shads are generally disjunct in their distribution. Downstream from the Conecuh National Forest, Alabama shads are considered rare in abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003) and appear to be in decline (Ross 2001).

Table C.3. Conditions of watersheds potentially supporting Alabama shad in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk [4]
Conecuh	3140304010	L. Conecuh	4	9	3	L	E	NR		SF
Oakmulgee	3150202120	Affonee	24	10	1	M	E	H		
	3150202130	Gully	24	7	1	M	E	H		
	3150202140	Cahaba	11	12		H	E	H		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—The Alabama shad is the only fully anadromous clupeid in Alabama. Historically, adults lived in coastal estuaries and bays and migrated long distances upstream into large rivers to spawn. Currently, Alabama shad may also live a land-locked existence residing in reservoirs and migrating up reservoir tributaries to spawn (Mettee et al. 1996). Spawning occurs in March-April in open, moderate currents over coarse sand, gravel, and cobble substrates in shoals and sand bars (Laurence and Yerger 1966, Mettee et al. 1989). Adults do not feed while on spawning runs in freshwater. Juveniles feed on aquatic dipterans and small fishes and inhabit swift cobble shoals of large tributary streams and rivers (Pierson et al. 1989a). Alabama shads are thus considered to be sensitive to siltation, water temperature, point source pollution, altered flows, and barriers.

Alabama shad have greatly declined in distribution and abundance over the last twenty years, due largely to blockage of spawning runs by dams (Buchanan et al. 1999), and also due to habitat alteration (NMFS 1997), excessive siltation (Lee et al. 1980), and water pollution (Robison & Buchanan 1988). According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of four possible watersheds show no indication of potential impairment (Table C.3). The other two watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, temperature, and water flow, with limited opportunities for National Forest management to improve conditions. All watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Alabama shads include any actions that could increase siltation, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or elevate temperatures. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Forest Service activities are unlikely to contribute to fish passage problems since shad are primarily a large riverine species and thus not inhabitants of the blockage prone smaller headwater streams. There could potentially be short-term and localized elevations in sediment run-off due to such forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Because Alabama shad are a large river species, Forest Service contributions to siltation are expected to be minimal and cumulative basin-wide and off-Forest siltation is likely to be the overwhelming and ongoing effect. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Alabama shad** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Crystal darter (*Crystallaria asperella*)

Distribution, Status, and Trend—The crystal darter is considered as at risk of population decline ("threatened") according to Warren et al. (2000). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "vulnerable" (S3) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Crystal darters were once distributed throughout the Mississippi River basin and portions of the Mobile River Basin. It may also have historically occurred through smaller coastal river systems along the Gulf Coast (Ross 2001). Today, it is thought to be extirpated from much of the upper Mississippi River basin in Ohio, Indiana, and Illinois, and the Coosa River in Alabama. It has also declined in occurrences within the Tombigbee, Black Warrior and Alabama Rivers (Pierson 1990). Currently, the species potentially inhabits six watersheds associated with the Conecuh and Tuskegee National Forests and the Oakmulgee Division of the Talladega National Forest (Table C.4). Crystal darters are not known to occur, but may be historic on several other National Forests within the southeast and Midwest. The National Forests represent approximately 5 percent of the species' range within the State of Alabama. Crystal darters are generally disjunct in their distribution and rare in their abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.4. Conditions of watersheds potentially supporting crystal darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140304010	L. Conecuh	4	9	3	L	E	R		SF
Oakmulgee	3150202120	Affonee	24	10	1	M	E	R		
	3150202130	Gully	24	7	1	M	E	R		
	3150202140	Cahaba	11	12		H	E	R		S
	3150202160	Lit.Oakmulgee	25	11	2	M	E	R		
Tuskegee	3150110070	Uphapee	10	38	5	H	A	R		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Crystal darters primarily inhabit deep (>60 cm) flowing currents over "clean" (i.e. relatively silt-free) sand-gravel substrates within depositional bars of small to medium rivers (Gilbert 1992). Crystal darters are often found in association with large gravel where it is known to bury itself and hide during the day (Ross 2001). They primarily reside within main river channels; however, they move into tributaries during flood events (Mount 1986). At night, crystal darters may also move laterally into shallower waters (Mount 1986). Diet includes a variety of aquatic insects (Ross 2001). Spawning occurs in early spring (Ross 2001). Crystal darters are thus sensitive to sedimentation, point-source pollution, altered flows, and barriers. According to the recent assessment of National Forest watersheds (Leftwich 2003), three out of six possible watersheds show no indication of potential impairment (Table C.4). The other three watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence crystal darters include any actions that could increase siltation, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts on this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in the Uphapee watershed. Moreover, Uphapee is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in Uphapee watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the lower Conecuh and Cahaba watersheds where excessive siltation has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the crystal darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Sipsey Warrior darter *(Etheostoma sp. Cf. bellator)*

Distribution, Status, and Trend—The Sipsey Warrior darter is a variant of the Warrior darter that probably warrants description as a definable species. According to Warren et al. (2000) it is at risk of population decline ("vulnerable"). The species has not yet been described and thus does not have a ranking (NatureServe 2003). It has been identified as a priority 1 species of highest concern (i.e. critically imperiled) within the State of Alabama (ADCNR 2003).

Sipsey Warrior darters are believed to be endemic only to the Sipsey Fork of the upper Black Warrior River basin in Alabama (as split out from the original Warrior darter distribution throughout the Locust Fork, Mulberry Fork, and Sipsey Forks of the upper Black Warrior River). Currently, the species potentially inhabits two watersheds within the Bankhead National Forest (Table C.5). Sipsey Warrior darters are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 80 percent of the species' range within the State of Alabama and the Nation. Sipsey Warrior darters are disjunct in their distribution. Where encountered, they are generally rare and in low abundance (Metee et al. 1996, Powers et al. 2001, Smith et al. 2002, ACDNR 2003).

Table C.5. Conditions of watersheds potentially supporting Warrior darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Bankhead	3160110010	U. Sipsey Fork	87	1		L	E	R		
	3160110020	L. Sipsey Fork	32	7	1	M	E	S		F

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Sipsey Warrior darters primarily inhabit shallow moderate currents over gravel and cobble substrates within riffles of headwater streams and rivers (Dycus & Howell 1974). Sipsey Warrior darters are thus considered to be sensitive to siltation, water temperature, point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), one of the two currently occupied watersheds shows no indication of potential impairment (Table C.5). The other watershed (Lower Sipsey Fork) may be impaired due to changes in flow associated with the Lewis Smith Reservoir. All watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Sipsey Warrior darters include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, block fish passage, elevate temperatures, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Moreover, the Sipsey Fork watersheds are an important for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Sipsey Warrior darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Florida sand darter (*Etheostoma bifascia*) (was *Ammocrypta*)

Distribution, Status, and Trend—The Florida sand darter is considered "currently stable" according to Warren et al. (2000). Globally the species is ranked as "apparently secure" (G4); within Alabama, the species is ranked as "vulnerable" (S3) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Florida sand darters range across a number of coastal drainages from the Perdido to the Choctawhatchee Rivers in Florida and Alabama. Currently, the species potentially inhabits six watersheds associated with the Conecuh National Forest (Table C.6). Florida sand darters may occur on several other National Forest management units within the southeast. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Florida sand darters are generally limited in their distribution. Within the Conecuh National Forest, Florida sand darters are fairly common (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.6. Conditions of watersheds potentially supporting Florida sand darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	C		S
	3140103070	Yellow-Watkins	14	21	1	M	E	C		S
	3140103080	Five Runs	21	34	5	M	E	C		
	3140103090	Yellow-Givens	12	21	1	L	E	C		S
	3140301050	U. Conecuh	3	23	3	M	E	C		S
	3140304010	L. Conecuh	4	9	3	L	E	C		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Florida sand darters primarily inhabit moderate swift currents over shifting sand substrates within large coastal streams (Williams 1969, Mettee et al. 1996). Florida sand darters may be sensitive to siltation and alteration in water flow (Herrington et al. 2001). According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of six possible watersheds show no indication of potential impairment (Table C.6). The other five watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Florida sand darters include any actions that could increase siltation or change water flow. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the upper Yellow watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow and Conecuh Rivers where excessive siltation has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Florida sand darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Holiday darter (*Etheostoma brevirostrum*) – Sensitive Species

Distribution, Status, and Trend—Holiday darters were only recently described as a species. It has also been suggested that the Alabama populations may warrant description as a separate species from the Georgia and Tennessee populations (Johnston & Phillips 2001). The holiday darter is considered at risk of population decline ("threatened") according to Warren et al.

(2000). This species has been identified as a priority 1 species of highest concern (i.e. critically imperiled) within the State of Alabama (ADCNR 2003). Globally the species is ranked as “imperiled” (G2); within Alabama, the species is ranked as “imperiled” (S2) (NatureServe 2003).

Holiday darters are endemic to the Coosa River basin in Alabama, Georgia and Tennessee. Historically, holiday darters probably ranged throughout the upper Coosa River tributaries; however, its range is now fragmented and limited to only four widely disjunct extant populations in the upper Conasauga, Coosawattee, and Etowah River systems within Georgia and Tennessee, and Shoal Creek, in Alabama. Within Alabama, it only occurs within Shoal Creek, tributary to the Choccolocco watershed and the Coosa River basin. Approximately half of the suitable habitat is within the Talladega National Forest (Table C.7). Holiday darters also occur on the Chattahoochee and Cherokee National Forests in Georgia and Tennessee. The National Forests represent approximately 70 percent of the species’ range within the State of Alabama. Holiday darters are highly endemic and disjunct in their distribution (Metee et al. 1996, Smith et al. 2002, ACDNR 2003). Although they may be found in moderate abundance within patchy suitable habitat areas, they are considered rare in overall abundance.

Table C.7. Conditions of watersheds potentially supporting holiday darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150106240	U. Choccolocco	71	11	1	H	E	L		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Holiday darters primarily inhabit clear, cool, moderate to swift (0.54-0.81 m/sec) currents over cobble-boulder-gravel substrates within relatively shallow (22-34cm) portions of runs, pools and sometimes riffles of medium to large streams (Page & Burr 1991, Suttkus & Etnier 1991). This species is found in greatest abundance in association with river weedbeds along runs (Page & Burr 1991). Holiday darters engage in paired spawning, attaching individual eggs on boulder or cobble substrates, particularly within rock crevices. Within Shoal Creek, these darters have been restricted and possibly eliminated from the lower portion of the watershed due to construction of the Whitesides Mill and Highrock reservoirs. Holiday darters are thus sensitive to sedimentation, water temperature, point source pollution, altered flows, and barriers. According to the recent assessment of National Forest watersheds (Leftwich 2003), the one occupied watershed (Upper Choccolocco) is rated as in “excellent” condition (Clingenpeel 2003) and shows no indication of potential impairment (Table C.7). These conditions are expected to continue under the preferred alternative (I) of the revised Forest Plan.

Potential Management Effects— Potential Forest Service management activities that could influence holiday darters include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, elevate temperatures, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In the upper Choccolocco watershed, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions. Moreover, the Upper Choccolocco is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. Although the watershed thought to harbor this species are rated as in “excellent” condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the holiday darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

<u>Choctawhatchee darter (*Etheostoma davisoni*)</u>

Distribution, Status, and Trend—The Choctawhatchee darter is considered “currently stable” according to Warren et al. (2000). Globally the species is ranked as “apparently secure” (G4); within Alabama, the species is ranked as “vulnerable” (S3) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Choctawhatchee darters are endemic to Gulf coastal rivers from the Escambia River, east to the Choctawhatchee River in Alabama and Florida. Currently, the species potentially inhabits six watersheds associated with the Conecuh National Forest (Table C.8). Choctawhatchee darters are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 10% percent of the species' range within the State of Alabama. Choctawhatchee darters are endemic and limited in their distribution. Within the Talladega National Forest, Choctawhatchee darters are fairly common (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.8. Conditions of watersheds potentially supporting Choctawhatchee darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	C		S
	3140103070	Yellow-Watkins	14	21	1	M	E	C		S
	3140103080	Five Runs	21	34	5	M	E	C		
	3140103090	Yellow-Givens	12	21	1	L	E	C		S
	3140104010	Blackwater	49	13	3	L	E	C		
	3140304010	L. Conecuh	4	9	3	L	E	C		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Choctawhatchee darters primarily inhabit sluggish currents over sand substrates along margins and sand bars, below riffles, or within pools of small streams (Howell 1968). This species is found in greatest abundance in association with aquatic plants, sticks, and root masses (Mettee et al 1996). Spawning occurs from mid-March to late May (Mettee et al. 1996). Choctawhatchee darters are thus considered to be sensitive to point source pollution, altered flows, and loss or modification of aquatic and streamside vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of six possible watersheds show no indication of potential impairment (Table C.8). The other four watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Choctawhatchee darters include any actions that could change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the upper Yellow watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow and Conecuh Rivers where excessive siltation and altered flows have been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Choctawhatchee darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Coldwater darter (*Etheostoma ditrema*)

Distribution, Status, and Trend—The coldwater darter is considered at risk of population decline ("threatened") according to Warren et al. (2000). Globally the species is ranked as "critically imperiled" (G1G2); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003). This species has been identified as a priority 2 species of high concern (i.e. "imperiled") within the State of Alabama (ADCNR 2003).

Coldwater darters are endemic to the Coosa River basin in Alabama, Georgia, and Tennessee (Mettee et al. 1996). Their range is now limited to less than 10 extant populations. Currently, the species potentially inhabits four watersheds associated with the Talladega National Forest (Table C.9). Coldwater darters may also occur on the Chattahoochee and Cherokee National Forests in Georgia and Tennessee. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Coldwater darters are generally clumped to disjunct in their distribution. Within the Talladega National Forest, coldwater darters are rare in abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.9. Conditions of watersheds potentially supporting coldwater darters in or within five miles of the National Forests in Alabama.

Forest	HUC code	Watershed	Watershed Conditions					Viability		
			% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150105220	U. Terrapin	26	18	1	M	E	R		P
	3150106240	U. Choccolocco	71	11	1	H	E	R		
	3150106250	M. Choccolocco	23	21	13	H	BA	R		**T**
	3150107010	Tallaseehatchee	22	21	5	M	BA	R		PTF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Coldwater darters primarily inhabit shallow (<1 m) slow currents over well-vegetated, coarse organic debris substrates within springs and spring-runs of small streams (Mettee et al 1996). This species is found in greatest abundance in association with aquatic vegetation (mainly moss and milfoil, and to a lesser extent algae) (Kuehne & Barbour 1983). Pair spawning occurs March through September with the eggs singly deposited on vertical plant surfaces (Mount 1986). Prey includes amphipods, chironomids, and copepods (Mount 1986). Coldwater darters are thus considered to be sensitive to water temperature and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of four possible watersheds show no indication of potential impairment (Table C.9). The other three watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, temperature, and water flow, with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are below average in two of the watersheds in which the species occurs. This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. The other watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence coldwater darters include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, elevate temperatures, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in two watersheds, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in portions of the middle Choccolocco watershed. However, overall watershed conditions are not likely to improve in the Tallaseehatchee watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within middle Choccolocco Creek where elevated temperatures has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the coldwater darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Tuskaloosa darter (*Etheostoma douglasi*) – Sensitive Species

Distribution, Status, and Trend—The Tuskaloosa darter is considered "currently stable" according to Warren et al. (2000) and at risk of population decline according to Wood & Mayden (1993). Globally the species is ranked as "imperiled" (G2); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Tuskaloosa darters are endemic to the Sipsey and Locust Forks of the upper Black Warrior River basin in Alabama. Historically, Tuskaloosa darters probably ranged throughout these upper basin drainages, and possibly included the Clear Creek branch of the Black Warrior River headwaters; however, its range is now limited to less than ten extant populations. Currently, the species potentially inhabits three watersheds associated with the Bankhead National Forest (Table C.10). Tuskaloosa darters are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 20 percent of the species' range within the State of Alabama. Tuskaloosa darters are generally disjunct in their distribution. Within the Bankhead National

Forest, Tuskaloosa darters are found in variable levels of abundance ranging from abundant to sparse (Metee et al. 1996, Powers et al. 2001, Smith et al. 2002, ACDNR 2003).

Table C.10. Conditions of watersheds potentially supporting Tuskaloosa darters in or within five miles of the National Forests in Alabama.

Forest	HUC code	Watershed	Watershed Conditions					Viability		
			% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Bankhead	3160110010	U. Sipsey Fork	87	1		L	E	A		
	3160110020	L. Sipsey Fork	32	7	1	M	E	A		F
	3160110030	U. Brushy	82	2		L	E	C		
	3160110040	L. Brushy	36	6		M	E	S		F
	3160110060	Clear	14	4	1	M	E	H?		SP

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Tuskaloosa darters primarily inhabit moderately swift currents over gravel-cobble and boulder-bedrock substrates within riffles of medium to large streams (Wood & Mayden 1993). This species is found in greatest abundance in association with slab boulders and bedrock. Tuskaloosa darters spawn in April through June. The diet is thought to be aquatic insect larvae and occasionally some mollusks (Mettee et al. 1996). Tuskaloosa darters are thus considered to be sensitive to siltation, water temperature, point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of four possible watersheds show no indication of potential impairment (Table C.10). The other two watersheds (Lower Brushy and Lower Sipsey Fork) exhibit an indicator of potential impairment for water flow, with limited opportunities for National Forest management to influence these conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Tuskaloosa darters include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Tuskaloosa darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Goldstripe darter (*Etheostoma parvapinne*)

Distribution, Status, and Trend—The goldstripe darter is considered "currently stable" according to Warren et al. (2000). Globally the species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003). This species has been identified as a priority 2 species of high concern (i.e. "imperiled") within the State of Alabama (ADCNR 2003).

Goldstripe darters range throughout Gulf coast drainages from Texas to Florida and north into the lower Mississippi River basin (Ross 2001). Within Alabama, it is distributed primarily below the fall line within the Mobile River basin and coastal drainages; however it is found in disjunct occurrences above the fall line, including within Clear Creek of the upper Black Warrior River basin (Mettee et al. 1996). Currently, the species potentially inhabits 13 watersheds associated with the Conecuh, Bankhead, and Tuskegee National Forests and the Oakmulgee Division of the Talladega National Forest (Table C.11). Goldstripe darters could possibly also occur on the Appalachicola and DeSoto National Forests in Florida and Mississippi. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Goldstripe darters are generally scattered in their distribution and rare in abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.11. Conditions of watersheds potentially supporting goldstripe darters in or within five miles of the National Forests in Alabama.

Forest	HUC code	Watershed	Watershed Conditions	Viability

			% FS	% ag	%u rba n	Road Density	Ratin g[1]	Status [2]	Ran k[3]	Risk[4]
Conecuh	3140103080	Five Runs	21	34	5	M	E	R		
	3140301050	U. Conecuh	3	23	3	M	E	R		S
	3140304010	L. Conecuh	4	9	3	L	E	R		SF
Oakmulgee	3150201220	L. Mulberry	8	16	1	M	E	R		S
	3150202120	Affonee	24	10	1	M	E	R		
	3150202140	Cahaba	11	12		H	E	R		S
	3160113030	Big Sandy	30	5	<1	M	E	R		
	3160113060	Elliotts	40	19	1	H	E	R		
	3160113090	Five Mile	27	8	3	M	E	R		
	3160113120	Big Brush	2	14	1	M	E	R		
Bankhead	3160110060	Clear	14	4	1	M	E	?		SP
Tuskegee	3150110050	Chewacla	1	24	7	L	A	R		SPF
	3150110070	Uphapee	10	38	5	H	A	R		**S**F

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Goldstripe darters primarily inhabit clear sluggish currents over gravel, sand, or clay substrates within runs, pools, or riffles of small streams (Kuehne & Barbour 1983, Page & Burr 1991, Ross 2001). This species is found in greatest abundance in association with dense aquatic vegetation (Gilbert 1992, Ross 2001), as well as springs and seeps, large woody debris, and leaf packs (Kuehne & Barbour 1983). Spawning most likely occurs March through June (Mettee et al. 1996) and eggs are deposited individually on plant stems, roots, or gravel near the base of plants (Ross 2001). Prey includes midges, mayflies, blackflies, and other aquatic insects (Mettee et al. 1996). Goldstripe darters are thus considered to be sensitive to siltation, turbidity, fluctuations in water temperature, point source pollution, altered flows, loss of aquatic or riparian vegetation, or loss of large woody debris. According to the recent assessment of National Forest watersheds (Leftwich 2003), six out of 13 possible watersheds show no indication of potential impairment (Table C.11). The other seven watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in two of the watersheds (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Potential Management Effects— Potential Forest Service management activities that could influence goldstripe darters include any actions that could cause excessive siltation, increased turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, elevate temperatures, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in Uphapee Creek. Moreover, Uphapee is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the Chewacla watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within mainstem Conecuh and Cahaba Rivers where excessive siltation has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the goldstripe darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Rush darter (*Etheostoma phytophyllum*)

Distribution, Status, and Trend—The Rush darter is considered at risk of population decline (“endangered”) according to Warren et al. (2000). Globally the species is ranked as “critically imperiled” (G1); within Alabama, the species is also ranked as “critically imperiled” (S1) (NatureServe 2003). This species has been identified as a priority 1 species of highest concern (i.e. critically imperiled) within the State of Alabama (ADCNR 2003).

Rush darters are endemic to the upper Black Warrior River basin in Alabama. Within this basin, they are disjunct in their distribution, being found only in three widely separated sub-basins: Turkey Creek in Jefferson County, Little Cove Creek in Etowah County, and Clear Creek in Winston County (Bart and Taylor 1999). Currently, the species potentially inhabits one watershed (Clear Creek) within the Bankhead National Forest (Table C.12). Rush darters are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 25 percent of the species' range. Within the Bankhead National Forest, Rush darters are locally rare in abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003, Johnston and Catro 2003,).

Table C.12. Conditions of watersheds potentially supporting Rush darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Bankhead	3160110060	Clear	14	4	1	M	E	R		SP

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Rush darters primarily inhabit cool, clear, sluggish to moderate currents over well-vegetated substrates within small spring fed streams or lowland headwater streams (Bart & Taylor 1999). This species is found in greatest abundance in association with emergent vegetation root masses (Bart & Taylor 1999). Rush darters are thus considered to be sensitive to siltation, water temperature, point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), the one occupied watershed (Clear) exhibits indicators of potential impairment for sediment and point source pollution with limited opportunities for National Forest management to improve conditions. The one watershed where the species potentially occurs has a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Rush darters include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, block fish passage, elevate temperatures, or remove riparian vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. Implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watershed thought to harbor this species are rated as in “excellent” condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Rush darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Alabama darter (*Etheostoma ramseyi*)

Distribution, Status, and Trend—The Alabama darter is considered “currently stable” according to Warren et al. (2000). Globally the species is ranked as “apparently secure” (G4); within Alabama, the species is ranked as “apparently secure” (S4) (NatureServe 2003). This species has been identified as a priority 4 species of least concern (i.e. secure) within the State of Alabama (ADCNR 2003).

Alabama darters are endemic to the Mobile River basin and Alabama. They are distributed below the fall line within the Alabama River drainage and above the fall line throughout the Cahaba River system. Currently, the species potentially inhabits five watersheds associated with the Oakmulgee Division of the Talladega National Forest (Table C.13). Alabama darters are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 10 percent of the species’ range within the State of Alabama. Alabama darters are endemic and generally limited in their distribution. Where present, they are fairly common (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.13. Conditions of watersheds potentially supporting Alabama darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]

Oakmulgee	3150201220	L. Mulberry	8	16	1	M	E	C		S
	3150202120	Affonee	24	10	1	M	E	C		
	3150202130	Gully	24	7	1	M	E	C		
	3150202140	Cahaba	11	12		H	E	C		S
	3150202160	Lit.Oakmulgee	25	11	2	M	E	C		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Alabama darters primarily inhabit sluggish currents over a variety of substrates within pools and riffles of small streams (Mettee et al. 1996). This species is only found in association with cobble, rubble, broken bedrock, or large woody debris (Mettee et al. 1996). Alabama darters spawn from March through May (Sutkus, Bailey & Bart 1994). Alabama darters are thus considered to be sensitive to siltation, water temperature, point source pollution, altered flow, and loss of large woody debris. According to the recent assessment of National Forest watersheds (Leftwich 2003), three out of five possible watersheds show no indication of potential impairment (Table C.13). The other two watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of “excellent” (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Alabama darters include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, elevate temperatures, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in “excellent” condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Alabama darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Tuscumbia darter (*Etheostoma tuscumbia*)

Although Tuscumbia darters are known to occur within the Tennessee River basin, they are disjunctly distributed and only inhabit lowland springs (Pierson 1990). Consequently, they are not expected to be located on or within the 5-mile zone of influence downstream from the Bankhead National Forest.

Backwater darter (*Etheostoma zonifer*)

Distribution, Status, and Trend—The backwater darter is considered “currently stable” according to Warren et al. (2000). Globally the species is ranked as “vulnerable” (G3G4); within Alabama, the species is ranked as “vulnerable” (S3) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Backwater darters are distributed below the fall line within the Alabama and Tombigbee River drainages of Alabama and Mississippi, and also in the Cowikee Creek and Chattahoochee River systems in Georgia. There are over 50 definable extant populations. Currently, the species potentially inhabits four watersheds associated with the Tuskegee National Forest and the Oakmulgee Division of the Talladega National Forest (Table C.14). Backwater darters could potentially also occur on the Tombigbee and Holly Springs National Forests in Mississippi. The National Forests represent approximately 10 percent of the species’ range within the State of Alabama. Backwater darters are endemic and limited in their distribution. Where found, they are rare and low in abundance (Metee et al. 1996, Johnston 2002, Smith et al. 2002, ACDNR 2003).

Table C.14. Conditions of watersheds potentially supporting backwater darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Oakmulgee	3150202140	Cahaba	11	12		H	E	S		S

	3150202160	Lit.Oakmulgee	25	11	2	M	E	P		
Tuskegee	3150110050	Chewacla	1	24	7	L	A	R		SPF
	3150110070	Uphapee	10	38	5	H	A	R		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Backwater darters primarily inhabit turbid sluggish to stagnant currents over muddy substrates within runs and adjacent pools of small streams (Mettee et al. 1996). This species is found in greatest abundance in association with high turbidity, high conductivity, and little to no aquatic vegetation (Peterson 1993). Backwater darters spawn March through June, depositing single eggs on small, submerged twigs and roots (Mettee et al 1996). Prey includes midges, mayflies, and other small aquatic organism (Mettee et al. 1996). Backwater darters are thus considered to be sensitive to loss of woody debris. According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of four possible watersheds show no indication of potential impairment (Table C.14). The other three watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in two of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence backwater darters include any actions that could modify habitat structure, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in Uphapee Creek. Moreover, Uphapee is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in Chewacla watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the Cahaba River where excessive siltation has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the backwater darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Lined chub (*Hybopsis lineapunctata*)

Distribution, Status, and Trend—The lined chub is considered at risk of population decline ("vulnerable") according to Warren et al. (2000). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "vulnerable" (S3) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Lined chubs are endemic to the Tallapoosa and Coosa River basins in Alabama, Georgia, and Tennessee. Its range may include less than 100 extant populations. Currently the species potentially inhabits ten watersheds associated with the Talladega National Forest (Table C.15). Lined chubs may occur on several other National Forest management units within the southeast. The National Forests represent approximately 20 percent of the species' range within the State of Alabama. Lined chubs are endemic and limited n their distribution. Where encountered, they are generally sparse to rare in abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003). Highest densities have been documented within Tallapoosa River tributaries where the species is considered to be of rare abundance.

Table C.15. Conditions of watersheds potentially supporting lined chub in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	**HUC code**	**Watershed**	**% FS**	**% ag**	**%urban**	**Road Density**	**Rating[1]**	**Status[2]**	**Rank[3]**	**Risk[4]**
Talladega	3150106240	U. Choccolocco	71	11	1	H	E	S		
	3150106250	M. Choccolocco	23	21	13	H	BA	PN		**T**
	3150106260	Cheaha	36	19	3	H	E	S		
	3150106330	Talladega	22	14	5	M	A	P		P
	3150107010	Tallaseehatchee	22	21	5	M	BA	P		PTF
	3150107110	U. Hatchet	11	6	1	H	E	S		S
	3150108090	Cane	19	5	2	H	E	R		
	3150108120	Cahulga	36	9	3	H	E	R		

	3150108140	Chulafinnee	21	13	2	H	E	P		
	3150108150	Ketchepedrakee	32	11	1	L	E	R		
[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average [2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near [3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk) [4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow										

Habitat Relationships and Limiting Factors—Lined chubs primarily inhabit flowing currents over gravel-sand-rubble substrates within riffles and pools of small to medium streams (Pierson et al 1986). They also seem to be found in association with leaf litter in sandy main channel pools (Pierson et al. 1986). The species spawns from May through June (Clemmer & Suttkus 1971). Prey includes aquatic and terrestrial insects (Metee et al. 1986). Lined chubs are thus considered to be sensitive to siltation, point source pollution, altered flows, and loss of riparian vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), five out of nine possible watersheds show no indication of potential impairment (Table C.15). The other four watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, temperature, and water flow, with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are “below average” in two of the watersheds in which the species occurs (Middle Choccolocco on the Shoal Creek District and Tallaseehatchee on the Talladega District). These ratings are primarily due to fine sediments eroding from upstream and downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. Overall watershed conditions are rated as “average” in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of “excellent”, a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence lined chubs include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in two watersheds, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions in some portions of the middle Choccolocco watershed. However, overall watershed conditions are not likely to improve in the Talladega and Tallaseehatchee watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the upper Hatchet watershed where excessive siltation has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the lined chub** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Skygazer shiner (*Notropis uranoscopus*)

Distribution, Status, and Trend—The skygazer shiner is considered "currently stable" according to Warren et al. (2000). Globally the species is ranked as "imperiled" (G2); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 2 species of high concern (i.e. "imperiled") within the State of Alabama (ADCNR 2003).

Skygazer shiners are endemic to the Mobile River basin generally below the fall line in Alabama. Currently, the species potentially inhabits six watersheds associated with the Tuskegee National Forest and the Oakmulgee Division of the Talladega National Forest (Table C.16). Skygazer shiners are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 5 percent of the species' range within the State of Alabama. Skygazer shiners are endemic and limited in their distribution. Where encountered, they are generally found in moderate to high abundance (Metee et al. 1996, Johnston 2002, Smith et al. 2002, ACDNR 2003).

Table C.16. Conditions of watersheds potentially supporting skygazer shiners in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]

Oakmulgee	3150202120	Affonee	24	10	1	M	E	A		
	3150202130	Gully	24	7	1	M	E	A		
	3150202140	Cahaba	11	12		H	E	A		S
	3150202160	Lit.Oakmulgee	25	11	2	M	E	P		
Tuskegee	3150110050	Chewacla	1	24	7	L	A	A		SPF
	3150110070	Uphapee	10	38	5	H	A	A		**S**F

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Skygazer shiners primarily inhabit shallow moderate to swift currents over sand-gravel substrates within shoals of large streams and rivers (Mettee et al. 1996). This species is found in greatest abundance in association with current and hardened substrates (Metee et al. 1996). It spawns from April through June (Mettee et al. 1996). Skygazer shiners are thus considered to be sensitive to siltation, point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), three out of six possible watersheds show no indication of potential impairment (Table C.16). The other three watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as “average” in two of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of “excellent”, a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence skygazer shiners include any actions that could increase siltation, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in Uphapee Creek. Moreover, Uphapee is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in Chewacla watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the Cahaba River where excessive siltation, point-source pollution, elevated temperatures, and altered flows has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the skygazer shiner** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

<u>Frecklebelly madtom (*Noturus munitus*)</u>

Distribution, Status, and Trend—The frecklebelly madtom is considered at risk of population decline (”threatened”) according to Ramsey (1986) and Warren et al. (2000). Globally the species is ranked as “vulnerable” (G3); within Alabama, the species is ranked as “imperiled” (S2) (NatureServe 2003). This species has been identified as a priority 2 species of high concern (i.e. “imperiled”) within the State of Alabama (ADCNR 2003).

Frecklebelly madtoms are endemic to the Mobile and Tensaw River basins in Mississippi, Alabama, Georgia and Tennessee (Ross 2001). Historically, frecklebelly madtoms probably ranged throughout these drainages; however its range is now limited to only five disjunct clusters of extant populations (Mettee et al. 1996). Currently, the species potentially inhabits two watersheds associated with the Oakmulgee Division of the Talladega National Forest (Table C.17). Frecklebelly madtoms also occur on the Chattahoochee and Cherokee National Forests. The National Forests represent approximately 10 percent of the species’ range within the State of Alabama. Frecklebelly madtoms are generally clumped in their distribution. Where encountered, they are generally rare and in low abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.17. Conditions of watersheds potentially supporting frecklebelly madtom in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]

Oakmulgee	3150202130	Gully	24	7	1	M	E	R		
	3150202140	Cahaba	11	12		H	E	R		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Frecklebelly madtoms primarily inhabit moderate to swift currents over gravel and cobble substrates within shoals, riffles, rapids, and runs of medium to large streams and small rivers (Metee et al. 1996). This species is found in greatest abundance in association with river weed and under large flat rocks (Metee et al. 1996). Spawning is in June through July (Trauth et al. 1981). Prey includes aquatic insects, particularly caddisflies, mayflies, black flies, and midges (Miller 1984, Ross 2001). Frecklebelly madtoms are thus considered to be sensitive to siltation, point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of two possible watersheds show no indication of potential impairment (Table C.17). The other watershed (Cahaba) exhibits an indicator of potential impairment for sediment with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence frecklebelly madtoms include any actions that could increase siltation, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the frecklebelly madtom** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Southern logperch (*Percina austroperca*)

Distribution, Status, and Trend—The Southern logperch is considered at risk of population decline ("vulnerable") according to Warren et al. (2000). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Southern logperch are endemic to the Conecuh and Choctawhatchee River basins in Alabama and Florida. Currently, the species potentially inhabits two watersheds associated with the Conecuh National Forest (Table C.18). Southern logperch are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent less than 1% percent of the species' range within the State of Alabama. Southern logperch are endemic and limited in their distribution. Where encountered, they are generally rare and in low abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.18. Conditions of watersheds potentially supporting Southern logperch in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140304010	L. Conecuh	4	9	3	L	E	R		SF
	3140301050	U. Conecuh	3	23	3	M	E	R		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Southern logperch primarily inhabit slow currents over shifting sand and gravel substrates within deep (2-3') shoals of large streams and rivers (Mettee et al. 1996). They probably spawn early in the year (Metee et al. 1996). They flip stones in search of aquatic insects (Metee et al. 1996). Southern logperch are thus considered to be sensitive to point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), the two occupied watersheds exhibits indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Southern logperch include any actions that could change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Southern logperch** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Coal darter (*Percina brevicauda*)

Distribution, Status, and Trend—The coal darter is considered at risk of population decline ("threatened") according to Warren et al. (2000). Globally the species is ranked as "imperiled" (G2); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 2 species of high concern (i.e. "imperiled") within the State of Alabama (ADCNR 2003).

Coal darters are endemic to the Mobile River basin in Alabama. Historically, coal darters probably ranged throughout the upper portions of most Mobile River drainages. Today, their distribution is limited to the Locust Fork of the Black Warrior, Cahaba, and Coosa River drainages (Shepard et al. 2002) and less than five known extant populations. Currently, the species potentially inhabits eight watersheds associated with the Oakmulgee Division and the main division of the Talladega National Forest (Table C.19). Coal darters are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 5% percent of the species' range within the State of Alabama. Coal darters are clumped or disjunct in their distribution. Where encountered, they are generally uncommon within the Black Warrior and Coosa River areas and rare within the Cahaba River (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.19. Conditions of watersheds potentially supporting coal darter in or within five miles of the National Forests in Alabama.

Forest	HUC code	Watershed	Watershed Conditions					Viability		
			% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150106250	M. Choccolocco	23	21	13	H	BA	P		T
	3150106260	Cheaha	36	19	3	H	E	P		
	3150106330	Talladega	22	14	5	M	A	NP		P
	3150107010	Tallaseehatchee	22	21	5	M	BA	NP		PTF
	3150107110	U. Hatchet	11	6	1	H	E	NL		S
Oakmulgee	3150202120	Affonee	24	10	1	M	E	R		
	3150202130	Gully	24	7	1	M	E	R		
	3150202140	Cahaba	11	12		H	E	P		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Coal darters primarily inhabit swift currents over gravel-cobble-sand substrates within bedrock troughs at the foot of rapids or riffle heads of large streams and rivers (Metee et al. 1996, NatureServe 2003). This species is found in greatest abundance in association with turbulence and velocity gradients (NatureServe 2003) as well as Podostemum or Justicia beds (Suttkus et al. 1994). Spawning probably occurs from May through June (Metee et al. 1996). Prey includes aquatic insect larvae, microcrustaceans, and aquatic worms (Metee et al. 1996). Coal darters are thus considered to be sensitive to siltation, point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), three out of eight possible watersheds show no indication of potential impairment (Table C.19). The other five watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, temperature, and water flow, with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are "below average" in two of the watersheds in which the species occurs (Middle Choccolocco on the Shoal Creek District and Tallaseehatchee on the Talladega District). These ratings are primarily due to fine sediments eroding from upstream and downstream private agricultural and residential lands; Forest Plan implementation is not expected to alter these conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence coal darters include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, elevate temperatures, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in two watersheds, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions within portions of the middle Choccolocco watershed. However, overall watershed conditions are not likely to improve in the Talladega and Tallaseehatchee watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the upper Hatchet watershed where excessive siltation has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the coal darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Freckled darter (*Percina lenticula*)

Distribution, Status, and Trend—The freckled darter is considered at risk of population decline ("threatened") according to Warren et al. (2000). Globally the species is ranked as "imperiled" (G2); within Alabama, the species is ranked as "vulnerable" (S3) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Freckled darters range from the Pearl River in Mississippi east to the Mobile River basin in Alabama, Mississippi, and Georgia (Mettee et al. 1996). Historically, freckled darters probably ranged throughout these drainages; however, their range is now limited to less than 20 extant populations within the Tombigbee, Cahaba, Tallapoosa, and Coosa River systems (Pierson 1990, Mettee et al. 1996). Currently, the species potentially inhabits seven watersheds associated with the main and Oakmulgee Divisions of the Talladega National Forest and the Tuskegee National Forest (Table C.20). Freckled darters also occur on the Chattahoochee National Forest in Georgia. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Freckled darters are generally clumped in their distribution. Where encountered, they are generally rare and in low abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.20. Conditions of watersheds potentially supporting freckled darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	**HUC code**	**Watershed**	**% FS**	**% ag**	**%urban**	**Road Density**	**Rating[1]**	**Status[2]**	**Rank[3]**	**Risk[4]**
Talladega	3150106330	Talladega	22	14	5	M	A	P		P
	3150107010	Tallaseehatchee	22	21	5	M	BA	P		PTF
Oakmulgee	3150202120	Affonee	24	10	1	M	E	NR		
	3150202130	Gully	24	7	1	M	E	R		
	3150202140	Cahaba	11	12		H	E	R		S
Tuskegee	3150110050	Chewacla	1	24	7	L	A	S		SPF
	3150110070	Uphapee	10	38	5	H	A	S		**S**F

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Freckled darters primarily inhabit deep swift currents over sand substrates within runs and rapids of main channel large streams and rivers (Metee et al. 1996, Ross 2001). Juveniles appear to prefer shallow riffles with *Justicia* beds (Metee et al. 1996). Adults also utilize cover associated with boulders, logs, and large woody debris (Pierson et al. 1989, Ross 2001). Spawning probably occurs from March through May but additional information is lacking (Metee et al. 1996). Diet includes aquatic insects, particularly larger mayflies, caddisflies, dragonflies, stoneflies, and hellgrammites (Ross 2001). Freckled darters are thus considered to be sensitive to point source pollution, altered flows, and loss of large woody debris. According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of seven possible watersheds show no indication of potential impairment (Table C.20). The other five watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, temperature, and water flow, with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural and residential lands; Forest Plan implementation is not expected to alter these conditions. Overall watershed conditions are rated as "average" in three of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence freckled darters include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, elevate temperatures, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in Uphapee Creek. Moreover, Uphapee is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the Tallaseehatchee and Chewacla watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the Cahaba River where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the freckled darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Longhead darter (*Percina macrocephala*)

Distribution, Status, and Trend—The longhead darter is considered at risk of population decline ("threatened") according to Warren et al. (2000). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003).

Longhead darters are endemic to the Cumberland and Tennessee River basins in Tennessee, Kentucky, Ohio, Pennsylvania, and Alabama (Etnier & Starnes 1993). Historically it was widespread within the tributaries of the Tennessee River, including many tributaries within Alabama. Now it is extirpated in all but one Tennessee River tributary (Little River, in Tennessee) and it is considered extirpated from the Cumberland River (Etnier & Starnes 1993). Consequently, the species was historical, but is unlikely to currently inhabit watersheds within the Bankhead National Forest (Table C.21). Longhead darters were also historical, and may or may not still remain on at least four other National Forests throughout the southeast. If this species was to be rediscovered, the National Forests would represent approximately 5 percent of the species' range within the State of Alabama.

Table C.21. Conditions of watersheds potentially supporting longhead darters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
	HUC code	Watershed	% FS	% ag	%urban	Road Density	g[1]	Status	Rank[3]	Risk[4]
Bankhead	6030002350	L. Flint			<1		BA	H		SPT
	6030002360	West Flint	16	37	1	L	E	H		
	6030005040	Town	2	35	<1	M	A	H		ST
	6030006010	Upper Bear	2	28	2	L	E	H		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Longhead darters primarily inhabit clear gentle currents over clean sand-detritus or bedrock-boulder substrates within large upland streams and small to medium rivers (Etnier & Starnes 1993). They are most often encountered in association with brush, emergent vegetation or boulders (Etnier & Starnes 1993). Longhead darters are thus considered to be sensitive to siltation, turbidity, point source pollution, altered flows, and loss of riparian or aquatic vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of four possible watersheds show no indication of potential impairment (Table C.21). The other three watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and temperature, with limited opportunities for National Forest management to improve these conditions. Watershed condition ratings (Clingenpeel 2003) are below average in only one of the watersheds in which the species occurs. This rating is primarily due to fine sediments eroding from downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. The other watersheds where the species occurs have an overall condition rating of average to excellent, conditions that will continue under the proposed Forest Plan direction.

Potential Management Effects— If this species is rediscovered or repatriated, potential Forest Service management activities that could influence longhead darters include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, modify habitat structure, block fish passage, remove or alter streamside vegetation, or limit small woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation could affect individuals, if present, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the lower Flint, Town, and upper Bear watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the lower Flint, Town, and upper Bear watersheds where excessive siltation has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the species because 1) this species may be extirpated from National Forest habitat and thus, effects on individuals are not likely, 2) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects on historical habitat so that they are insignificant and discountable, and 3) Forest Plan direction encourages actions that may lead to re-introduction of the species and will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species..

Bronze darter (*Percina palmaris*)

Distribution, Status, and Trend—The bronze darter is considered "currently stable" according to Warren et al. (2000). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "vulnerable" (S3) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Bronze darters are endemic to the Tallapoosa and Coosa drainages of the Mobile River basin in Alabama, Georgia, and Tennessee. It is primarily located above the fall line in Alabama. Currently, the species potentially inhabits 13 watersheds associated with the Talladega National Forest (Table C.22). Bronze darters also occur on the Chattahoochee and Cherokee National Forests in Georgia and Tennessee. The National Forests represent approximately 5 percent of the species' range within the State of Alabama. Bronze darters are endemic and limited in their distribution. Where encountered, they are generally rare and in low abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.22. Conditions of watersheds potentially supporting bronze darter in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
	HUC code	Watershed	% FS	% ag	rban	Road Density	Rating	Status[2]	Rank[3]	Risk
Talladega	3150105220	U. Terrapin	26	18	1	M	E	R		P
	3150105240	Hurricane	6	14	1	L	E	R		SP
	3150106240	U. Choccolocco	71	11	1	H	E	R		
	3150106250	M. Choccolocco	23	21	13	H	BA	R		**T**
	3150106260	Cheaha	36	19	3	H	E	R		
	3150106330	Talladega	22	14	5	M	A	R		P
	3150107010	Tallaseehatchee	22	21	5	M	BA	R		PTF
	3150107110	U. Hatchet	11	6	1	H	E	R		S
	3150107140	Weogufka	1			H	E	R		
	3150108060	Muscadine	2			H	E	R		S
	3150108090	Cane	19	5	2	H	E	R		
	3150108120	Cahulga	36	9	3	H	E	R		
	3150108140	Chulafinnee	21	13	2	H	E	R		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Bronze darters primarily inhabit deep moderate currents over gravel-cobble-boulder substrates within riffles and runs of large streams and small rivers (Metee et al. 1996). This species is found in greatest abundance in association with water willow or river weed (Metee et al. 1996). Spawning occurs from March through May (Mettee et al. 1996). Diet consists of various types of aquatic insects and snails (Wieland 1983). Bronze darters are thus considered to be sensitive to siltation, point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), six out of 13 possible watersheds show no indication of potential impairment (Table C.22). The other seven watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, temperature, and water flow, with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are "below average" in two of the watersheds in which the species occurs (Middle Choccolocco on the Shoal Creek District and Tallaseehatchee on the Talladega District). These ratings are primarily due to fine sediments eroding from upstream and downstream private agricultural and residential lands; Forest Plan implementation is not expected to alter these conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence bronze darters include any actions that could increase siltation, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in two watersheds, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions in portions of the middle Choccolocco watershed. However, overall watershed conditions are not likely to improve in the Talladega and Tallaseehatchee watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the upper Hatchet and Muscadine watersheds where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the bronze darter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Crayfish (*Cambarus englishi*)

Distribution, Status, and Trend—*Cambarus englishi* is considered a "special concern" species at risk of population decline according to Taylor et al. (1996). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "vulnerable" (S3) (NatureServe 2003).

Cambarus englishi are endemic to the piedmont physiographic area and the Tallapoosa River basin in Alabama and Georgia (Butler 2002). Currently, the species potentially inhabits five watersheds associated with the Talladega National Forest (Table C.23). *Cambarus englishi* are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. *Cambarus englishi* are generally endemic in their distribution and rare in their abundance.

Table C.23. Conditions of watersheds potentially supporting *Cambarus englishi* in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest		Watershed	% FS	ag	%urban	Road Density	g[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150108060	Muscadine	2			H	E	R	F1	S
	3150108090	Cane	19	5	2	H	E	R		
	3150108120	Cahulga	36	9	3	H	E	R		
	3150108140	Chulafinnee	21	13	2	H	E	R		
	3150108150	Ketchepedrakee	32	11	1	L	E	R		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average [2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near [3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk) [4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—*Cambarus englishi* inhabit various substrates within riffle and pool habitats of streams (Hobbs & Hall 1972, Butler 2002a). Aquatic crayfish generally require ample instream habitat cover, such as that provided by large woody debris, boulders, or stream banks (Stein 1977). Members of this genus are opportunistic omnivores, feeding on a variety of vegetation, detritus, insects, snails, and other invertebrates (Hobbs III, 1993). Most southeastern crayfish mate in the fall and brood their young through winter and into spring (Talylor et al. 1996). *Cambarus englishi* are thus considered to be sensitive to point source pollution (Guiasu 2002), altered flows, and loss of riparian overstory vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), four out of five possible watersheds show no indication of potential impairment (Table C.23). The other watershed exhibits an indicator of potential impairment for sediment with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence *Cambarus englishi* include any actions that could change water flow, release toxic chemicals, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for *Cambarus englishi*** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Rusty gravedigger crayfish (*Cambarus miltus*)

Distribution, Status, and Trend—The rusty gravedigger crayfish is considered a "threatened" species at risk of population decline according to Taylor et al. (1996). Globally the species is ranked as "imperiled" (G2); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Rusty gravedigger crayfish are endemic to the Escambia River basin in Alabama and Florida (NatureServe 2002). It is recorded in only Baldwin County, and thus may not occur further upstream on the Conecuh National Forest (Fitzpatrick 1978, Hobbs 1989). However, suitable and potential habitat is found on two watersheds associated with the Conecuh National Forest (Table C.24). Rusty gravedigger crayfish are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent an unknown percent of the species' range within the State of Alabama. Rusty gravedigger crayfish are isolated in their distribution and locally rare in their abundance.

Table C.24. Conditions of watersheds potentially supporting rusty gravedigger crayfish in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%u rba n	Road Density	Ratin g[1]	Status [2]	Ran k[3]	Risk[4]
Conecuh	3140301050	U. Conecuh	3	23	3	M	E	P		S
	3140304010	L. Conecuh	4	9	3	L	E	P		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—The rusty gravedigger crayfish primarily burrows within mud substrates of banks of streams and rivers. Aquatic crayfish generally require ample instream habitat cover, such as that provided by large woody debris, boulders, or stream banks (Stein 1977). Members of this genus are opportunistic omnivores, feeding on a variety of vegetation, detritus, insects, snails, and other invertebrates (Hobbs III, 1993). Rusty gravedigger crayfish are thus considered to be sensitive to point source pollution (Guiasu 2002), altered flows, and loss of riparian overstory vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), both watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence rusty gravedigger crayfish include any actions that could change water flow, release toxic chemicals, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation is not likely to contribute to adverse impacts on this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the rusty gravedigger crayfish** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

A crayfish (*Procambarus marthae*)

Distribution, Status, and Trend—*Procambarus marthae* is considered a "special concern" species at risk of population decline according to Taylor et al. (1996). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Procambarus marthae are endemic to the Alabama River basin and are recorded in Dallas, Hale, Monroe, and Perry Counties in Alabama (Hobbs 1989). Currently, the species is not known, but potentially inhabits three watersheds associated with the Oakmulgee Division of the Talladega National Forest (Table C.25). *Procambarus marthae* are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. *Procambarus marthae* are generally disjunct in their distribution and rare in their abundance.

Table C.25. Conditions of watersheds potentially supporting *Procambarus marthae* in or within five miles of the National Forests in Alabama.

Forest	HUC code	Watershed	Watershed Conditions					Viability		
			% FS	ag	%urban	Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Oakmulgee	3150202120	Affonee	24	10	1	M	E	P		
	3150202130	Gully	24	7	1	M	E	P		
	3150202140	Cahaba	11	12		H	E	P		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—*Procambarus marthae* primarily inhabit low gradient sluggish to standing water currents over sand-clay substrates within streams and rivers (NatureServe 2003). This species is found in greatest abundance in association with abundant plant debris (NatureServe 2003). This species is probably a detritivore (NatureServe 2003). Aquatic crayfish generally require ample instream habitat cover, such as that provided by large woody debris, boulders, or stream banks (Stein 1977). *Procambarus marthae* are thus considered to be sensitive to point source pollution (Guiasu 2002), altered flows, and loss of riparian overstory vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of three possible watersheds show no indication of potential impairment (Table C.25). The other watershed exhibits an indicator of potential impairment for sediment, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence *Procambarus marthae* include any actions that could change water flow, release toxic chemicals, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the Cahaba River, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Cahaba River where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for *Procambarus marthae*** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Rayed creekshell (*Anodontoides radiatus*)

Distribution, Status, and Trend—The rayed creekshell is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as “vulnerable” (G3); within Alabama, the species is ranked as “critically imperiled” (S1S2) (NatureServe 2003). This species has been identified as a priority 4 species of low concern (i.e. fairly secure) within the State of Alabama (ADCNR 2003).

Rayed creekshells range throughout the Mobile River basin in Alabama, Mississippi, Georgia, and Tennessee and historically was in the Escambia River basin of Florida and Alabama (NatureServe 2003). Currently, the species potentially inhabits five watersheds associated with the Conecuh and Tuskegee National Forests and the Oakmulgee Division of the Talladega National Forest (Table C.26). Rayed creekshells also occur within the DeSoto National Forest in Mississippi and the Chattahoochee National Forest in Georgia. The National Forests represent approximately 10 percent of the species’ range within the State of Alabama. Rayed creekshells are generally widespread in their distribution and locally common.

Table C.26. Conditions of watersheds potentially supporting rayed creekshells in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status	Rank[3]	Risk[4]
Conecuh	3140301050	U. Conecuh	3	23	3	M	E	H		S
	3140304010	L. Conecuh	4	9	3	L	E	H		SF
Oakmulgee	3160113030	Big Sandy	30	5	<1	M	E	L		
	3150110050	Chewacla	1	24	7	L	A	L		SPF
Tuskegee	3150110070	Uphapee	10	38	5	H	A	L		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Rayed creekshells primarily inhabit low to moderate gradient sluggish currents over mud-sand or gravel substrates within pools and riffles of small headwater streams and large rivers (ACDNR 2003, NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Rayed creekshells are thus considered to be sensitive to siltation, point source pollution, channel alterations, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of three possible watersheds show no indication of potential impairment (Table C.26). The other two watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as “average” in two of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of “excellent”, a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence rayed creekshells include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in Uphapee Creek. Moreover, Uphapee is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in Chewacla watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within Chewacla and Uphapee where excessive siltation and altered flows has been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the rayed creekshell** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Alabama spike (*Elliptio arca*)

Distribution, Status, and Trend—The Alabama spike is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 1 species of highest concern (i.e. critically imperiled) within the State of Alabama (ADCNR 2003).

Alabama spikes range through Gulf coast large river systems in Alabama, and four other States. Historically, Alabama spikes probably ranged throughout the Alabama River tributaries; however it is now dwindling everywhere except within the Sipsey River. Currently, the species potentially inhabits four watersheds associated with the Bankhead and Talladega National Forests (Table C.27). Alabama spikes may occur on several other National Forest management units within the southeast. The National Forests represent less than 5 percent of the species' range within the State of Alabama. Alabama spikes are generally scattered in their distribution. Within the Sipsey River they are locally common; elsewhere, they are generally sparse in their abundance (Smith et al. 2002, ACDNR 2003).

Table C.27. Conditions of watersheds potentially supporting Alabama spike in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Bankhead	3160110010	U. Sipsey Fork	87	1		L	E	S		
	3160110020	L. Sipsey Fork	32	7	1	M	E	S		F
	6030006010	Upper Bear	2	28	2	L	E	S		S
Talladega	3150105220	U. Terrapin	26	18	1	M	E	S		P

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Alabama spikes primarily inhabit high gradient swift currents over gravel substrates within lateral bars and riffles of large streams and rivers (Hartfield & Jones 1990, ACDNR 2003). This species appears to be tolerant of silt and pollution. Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). It may have a narrow range of suitable fish hosts including *Etheostoma artosiae* and *Percina nigrofasciata* (Haag & Warren 2001). Alabama spikes are thus considered to be sensitive to barriers, channelization, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of four possible watersheds show no indication of potential impairment (Table C.27). The other three watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and water flow, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Alabama spikes include any actions that could change water flow, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Moreover, the Sipsey Fork and Terrapin watersheds are important for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. Although the watersheds thought to harbor this species are rated as in “excellent” condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Alabama spike** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Purple pigtoe (*Fusconaia succissa*)

Distribution, Status, and Trend—The purple pigtoe is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as “vulnerable” (G3); within Alabama, the species is ranked as “imperiled” (S2) (NatureServe 2003). This species has been identified as a priority 4 species of low concern (i.e. fairly secure) within the State of Alabama (ADCNR 2003).

Purple pigtoes are endemic to the Yellow, Escambia, and Choctawhatchee River systems in Alabama and Florida. Historically, purple pigtoes probably ranged throughout these drainages; however, their range may now be limited to only the Choctawhatchee, Escambia, and Yellow River basins. Currently, the species potentially inhabits six watersheds associated with the Conecuh National Forest (Table C.28). Purple pigtoes are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 20 percent of the species’ range within the State of Alabama. Purple pigtoes are generally clumped in their distribution and sparse in their abundance.

Table C.28. Conditions of watersheds potentially supporting purple pigtoes in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	ag	%urban	Density	Rating[1]	Status[2]	Rank	Risk[4]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	S		S

	3140103070	Yellow-Watkins	14	21	1	M	E	S		S
	3140103080	Five Runs	21	34	5	M	E	S		
	3140103090	Yellow-Givens	12	21	1	L	E	S		S
	3140301050	U. Conecuh	3	23	3	M	E	S		S
	3140304010	L. Conecuh	4	9	3	L	E	S		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Purple pigtoes primarily inhabit low and moderate gradient currents over mud and sand substrates within riffles of streams and medium rivers (ACDNR 2003, NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). Factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Purple pigtoes are thus considered to be sensitive to point source pollution, barriers, channel alteration, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of six possible watersheds show no indication of potential impairment (Table C.28). The other five watersheds exhibit combinations of indicators of potential impairment for sediment and water flow with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence purple pigtoes include any actions that could change water flow, release toxic chemicals, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the upper Yellow watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow and Conecuh Rivers where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the purple pigtoe** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Southern sandshell (*Lampsilis australis*)

Distribution, Status, and Trend—The Southern sandshell is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "imperiled" (G2); within Alabama, the species is ranked as "critically imperiled" (S1S2) (NatureServe 2003). This species has been identified as a priority 1 species of highest concern (i.e. critically imperiled) within the State of Alabama (ADCNR 2003).

Southern sandshells are endemic to the Choctawhatchee, Escambia, and Yellow Rivers of Alabama. Historically, Southern sandshells probably ranged throughout these drainages; however, their range is now limited to the Choctawhatchee, Escambia, and Yellow Rivers (ACDNR 2003). Currently, the species potentially inhabits six watersheds associated with the Conecuh National Forest (Table C.29). Southern sandshells are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 20 percent of the species' range within the State of Alabama. Southern sandshells are endemic and limited in their distribution. Where encountered, they are generally rare and in low abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.29. Conditions of watersheds potentially supporting Southern sandshells in or within five miles of the National Forests in Alabama.

Forest	HUC code	Watershed	Watershed Conditions	Viability

			% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	R		S
	3140103070	Yellow-Watkins	14	21	1	M	E	R		S
	3140103080	Five Runs	21	34	5	M	E	R		
	3140103090	Yellow-Givens	12	21	1	L	E	R		S
	3140301050	U. Conecuh	3	23	3	M	E	R		S
	3140304010	L. Conecuh	4	9	3	L	E	R		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Southern sandshells primarily inhabit low to moderate gradient slow to fast currents over soft sandy substrates within riffle habitats of medium streams to large rivers (NatureServe 2003, ACDNR 2003). This species is found in greatest abundance in association with sandy substrates and clear water (NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Southern sandshells are thus considered to be sensitive to siltation, point source pollution, eutrophication, barriers, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of six possible watersheds show no indication of potential impairment (Table C.29). The other three watersheds exhibit combinations of indicators of potential impairment for sediment and water flow with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Southern sandshells include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the upper Yellow watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow and Conecuh Rivers where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Southern sandshell** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Alabama heelsplitter (*Lasmigona complanta alabamensis*)

Distribution, Status, and Trend—The Alabama heelsplitter is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as “imperiled” (G2T2T3); within Alabama, the species is ranked as “critically imperiled” (S1) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Alabama heelsplitters are endemic to the Mobile River basin in Alabama, Georgia, and Mississippi. Within Alabama, it is found in the Cahaba, middle Alabama, Sipsey and Locust Fork drainages. Historically, Alabama heelsplitters ranged throughout most of the Mobile River tributaries. Currently, the species potentially inhabits three watersheds associated with the Tuskegee National Forest and the Oakmulgee Division of the Talladega National Forest (Table C.30). Alabama heelsplitters may occur on several other National Forest management units within the southeast. The National Forests represent less than 5 percent of the species' range within the State of Alabama. Alabama heelsplitters are generally scattered in their distribution. Where encountered, they are fairly common (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.30. Conditions of watersheds potentially supporting Alabama heelsplitters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk
Oakmulgee	3150202120	Affonee	24	10	1	M	E	C		
Tuskegee	3150110050	Chewacla	1	24	7	L	A	C		SPF
	3150110070	Uphapee	10	38	5	H	A	C		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Information is lacking on this species (NatureServe 2003). Presumably this species inhabits tributary streams and small to medium sized rivers. Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Alabama heelsplitters are thus considered to be sensitive to siltation, point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of three possible watersheds show no indication of potential impairment (Table C.30). The other two watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as “average” in two of the watersheds (Clingenpeel 2003). The other watershed where the species potentially occurs has a condition rating of “excellent”, a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Alabama heelsplitters include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in Uphapee Creek. Moreover, Uphapee is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the Chewacla and Uphapee watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within Chewacla and Uphapee watersheds where excessive siltation and altered flows have been identified as high viability concerns for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Alabama heelsplitter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2)

Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Tennessee heelsplitter (*Lasmigona holstonia*)

Distribution, Status, and Trend—The Tennessee heelsplitter is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 2 species of high concern (i.e. "imperiled") within the State of Alabama (ADCNR 2003).

Tennessee heelsplitters are restricted to the Appalachian and Cumberland regions of the southeastern United States (NatureServe 2003). The species is found in the upper Tennessee River basin and a few Coosa headwater streams and tributaries, primarily in Tennessee and Georgia (ACDNR 2003). Presumably its range has been drastically reduced. Currently, the species potentially inhabits one watershed associated with the Talladega National Forest (Table C.31). Tennessee heelsplitters also occur on at least three other National Forests within the southeast. The National Forests represent approximately 70 percent of the species' range within the State of Alabama. Tennessee heelsplitters are generally scattered in their distribution and locally rare in abundance (Smith et al. 2002, ACDNR 2003).

Table C.31. Conditions of watersheds potentially supporting Tennessee heelsplitters in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank	Risk[4]
Talladega	3150105220	U. Terrapin	26	18	1	M	E	L		P

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Tennessee heelsplitters primarily inhabit shallow water of various currents over sand and mud substrates within riffles of small headwater and tributary streams and small spring runs, and occasionally backwaters and side channel pools of large rivers (NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). Factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Tennessee heelsplitters are thus considered to be sensitive to point source pollution, barriers, channel modification, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), the only occupied watershed exhibits an indicator of potential impairment for point source pollution with limited opportunities for National Forest management to improve conditions. The one watershed where the species potentially occurs has a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Tennessee heelsplitters include any actions that could increase change water flow, release toxic chemicals, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. Implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watershed thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Tennessee heelsplitter** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

<u>Alabama pearlshell (Margaritifera marrianae) -- Candidate</u>

Distribution, Status, and Trend— The Alabama pearlshell is a candidate for possible future federal listing and is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "critically imperiled" (S1S2) (NatureServe 2003). This species has been identified as a priority 1 species of highest concern (i.e. critically imperiled) within the State of Alabama (ADCNR 2003).

Alabama pearlshells are restricted to only a small south-central portion of the Alabama River and the Escambia River basin within the lower coastal plain of Alabama (ADCNR 2003). Historically this species may have been endemic to only the Escambia River basin. Currently there are only four extant populations of Alabama pearlshells within the headwater streams of the upper Conecuh River watershed and one within a tributary to the Alabama River (Shelton 1997). Only two populations show evidence of recent recruitment (NatureServe 2003). The closest known extant population is within a small tributary stream over five miles upstream from the Conecuh National Forest. It is possible that this species still inhabits two watersheds of the Conecuh National Forest (Table C.32). Alabama pearlshells are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent less than 5 percent of the species' range within the State of Alabama. Alabama pearlshells are endemic and limited in their distribution. Where encountered, they are generally rare and in low abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.32. Conditions of watersheds potentially supporting Alabama pearlshells in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140301050	U. Conecuh	3	23	3	M	E	R		S
	3140304010	L. Conecuh	4	9	3	L	E	R		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Alabama pearlshells primarily inhabit low gradient slow to moderate shallow (<0.5m) currents over sand and gravel substrates within pools and riffles of small headwater and tributary pine-barren streams (Shelton 1997, ACDNR 2003). This species is found in greatest abundance in association with blackwater (i.e. tanic-acid) and high organic particulates (NatureServe 2003). Glochidia fish hosts are unknown. Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, Alabama pearlshells require clean gravel riffles and are especially susceptible to the threat of stream degradation resulting from low dissolved oxygen levels or high chlorine concentrations in waterways. Additionally, this species does not survive in impoundments and reservoirs. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Alabama pearlshells are thus considered to be sensitive to siltation, point source pollution, changes in pH, loss of riparian vegetation, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), the two occupied watersheds exhibit combinations of indicators of potential impairment for sediment and water flow with limited opportunities for National Forest management to improve conditions. The two watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

The decline and extirpation of Alabama pearlshell populations may be attributed to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Passage of host fish may also be a factor. Based upon the description of off-Forest occupied habitat (Shelton 1997), there may be 10 or more miles of suitable habitat on the Conecuh National Forest. Recent drought conditions and existing barriers to fish passage may limit the extent of fish hosts and thus the ability for the species to perpetuate or re-populate these areas.

Potential Management Effects— Potential Forest Service management activities that could influence Alabama pearlshells include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

At this time, it is unlikely that Alabama pearlshells inhabit the Conecuh National Forest. However, the standards of the revised Land and Resource Management Plan should provide adequate protection to their suitable habitat and provide the framework for eventual restoration and re-patriation. As discussed in the general effects section, protective and pro-active habitat management should provide for future restoration efforts.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Alabama pearlshell** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Southern hickorynut (*Obovaria jacksoniana*) – Sensitive Species

Distribution, Status, and Trend—The Southern hickorynut is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "critically impaired" (G1G2); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern within the State of Alabama (ADCNR 2003).

The Southern hickorynut ranges from Alabama through Texas and Missouri. Within Alabama, Southern hickorynut mussels are only known to inhabit the Sipsey, Buttahatchee, and Upper Tombigbee Rivers (NatureServe 2003) and thus they are not likely to be found on or near the National Forests in Alabama. They are known to occur on three other National Forests elsewhere across the southeast.

Alabama hickorynut (*Obovaria unicolor*) – Sensitive Species

Distribution, Status, and Trend—The Alabama hickorynut is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority two species of high concern within the State of Alabama (ADCNR 2003).

Alabama hickorynuts range across Alabama, Mississippi, and Louisiana (NatureServe 2003). Within Alabama, they are primarily found in the Sipsey River system. Alabama hickorynuts were last reported in 1990 within the mainstem Cahaba River in Bibb County. Currently, the species potentially inhabits four watersheds associated with the Oakmulgee Division of the Talladega National Forest (Table C.33). Alabama hickorynuts may occur on several other

National Forest management units within the southeast. The National Forests represent less than 5 percent of the species' range within the State of Alabama. Alabama hickorynuts are generally scattered in their distribution. They are common only within the Sipsey River system; elsewhere they are sparse in their abundance (NatureServe 2003).

Table C.33. Conditions of watersheds potentially supporting Alabama hickorynuts in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Oakmulgee	3150202120	Affonee	24	10	1	M	E	P		
	3150202130	Gully	24	7	1	M	E	P		
	3150202140	Cahaba	11	12		H	E	P		S
	3150202160	Lit.Oakmulgee	25	11	2	M	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—The Alabama hickorynut primarily inhabits moderate gradients and currents over sand and gravel substrates within both streams and rivers (NatureServe 2003). It may be restricted in its host fish species (*A. beanyi*, *A. meridiana*, and *Etheostoma artesiae*) (Haag & Warren 2001). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Alabama hickorynuts are thus considered to be sensitive to siltation, point source pollution, channelization, barriers, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), one of four possible watersheds shows no indication of potential impairment (Table C.33). The other three watersheds show combinations of indicators of potential impairment for sediment, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003); plan implementation is not expected to change this condition.

Potential Management Effects— Potential Forest Service management activities that could influence Alabama hickorynuts include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Alabama hickorynut** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Georgia pigtoe (*Pleurobema hanleyianum*) -- Candidate

Distribution, Status, and Trend— The Georgia pigtoe is a candidate for possible future federal listing and is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "historic and possibly extirpated" (SH) (NatureServe 2003). This species has been identified as an extirpated species within the State of Alabama (ADCNR 2003).

Georgia pigtoes are endemic to the Mobile River Basin. They where historically distributed within the Coosa River and probably many of the tributaries in Alabama, Georgia, and Tennessee. Historic collections are from Terrapin, Talladega, and Hatchet Creeks on the Talladega National Forest (USFWS 2000). Live specimens have not been seen for a decade or more within the State of Alabama and it may be extirpated (USFWS 1999). The species is thought to be extirpated from over 90% of its entire historical range (NatureServe 2003). Extant populations are known to inhabit the upper Coosa River basin in Georgia and Tennessee. Currently, the species is only known to be historic in two watersheds associated with the Talladega National Forest (Table C.34). Georgia pigtoes have also been reported in the Conasauga River near the Cherokee National Forest in Georgia.

Table C.34. Conditions of watersheds potentially supporting Georgia pigtoe in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank	Risk[4]
Talladega	3150105220	U. Terrapin	26	18	1	M	E	H		P
	3150106330	Talladega	22	14	5	M	A	H		P

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Georgia pigtoes primarily inhabit moderate gradient and swift shallow currents over coarse sand and gravel substrates within runs, riffles, or shoals of small to medium rivers and large tributary streams (Parmalee & Bogan 1998, NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). The breeding season and fish host for the glochidia are unknown. As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Georgia pigtoes are thus considered to be sensitive to siltation and altered flows (NatureServe 2003).

The 3 known or suspected extant populations of Georgia pigtoe mussels probably inhabit less than half of the suitable habitat for this species within the National Forests in Alabama. Recent drought conditions and existing barriers to fish passage may limit populations from the upper portions of these watersheds. The decline and extirpation of most populations of Georgia pigtoe may be attributed to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Such historical conditions have lead to the current status of this species being considered as at a high risk of continued decline in 2 out of 3 potential species-inhabited Forest Service watersheds (see EIS, section 3.B.4, for discussion of the derivation and interpretation of these rankings). Based on the watershed assessment completed in conjunction with the Forest Plan EIS, excessive sediment and altered flows may contribute the greatest risk to the viability of this species. Within the Talladega watershed, the opportunities for Forest Service influence, either positive or negative, are limited given the interspersion of private and upstream lands, and due to the overwhelming downstream development, industry, agriculture, and other land uses. The Forest Service may have a greater role in restoration within the Terrapin and Hatchet watersheds. However, since this is a riverine species, other factors such as off-Forest habitat fragmentation and pollution may override upper watershed improvements.

Potential Management Effects— If this species is rediscovered or repatriated, potential Forest Service management activities that could influence Georgia pigtoes include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation could affect individuals, if present, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Moreover, Terrapin Creek is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the Talladega watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the species because 1) this species may be extirpated from National Forest habitat and thus, effects on individuals are not likely, 2) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects on historical habitat so that they are insignificant and discountable, and 3) Forest Plan direction encourages actions that may lead to re-introduction of the species and will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Alabama clubshell (*Pleurobema trochelianum*) -- Candidate

Distribution, Status, and Trend— The Alabama clubshell is a candidate for possible future federal listing and is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "historic and possibly extirpated" (SH) (NatureServe 2003). This species has been identified as an extirpated species within the State of Alabama (ADCNR 2003).

Alabama clubshells are endemic to the Mobile River Basin. They where historically distributed within the Coosa River and probably many of the tributaries in Alabama, Georgia, and Tennessee. Historic collections are from Terrapin, Shoal, and Hatchet Creeks on the Talladega National Forest (USFWS 2000). Live specimens have not been seen for a decade or more within the State of Alabama and it may be extirpated (USFWS 1999). The species is thought to be extirpated from over 90% of its entire historical range (NatureServe 2003). Extant populations are known to inhabit the upper Coosa River basin in Georgia and Tennessee. Currently, the species is only known to be historic in three watersheds associated with the Talladega National Forest (Table C.35).

Table C.35. Conditions of watersheds potentially supporting Alabama clubshells in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150105220	U. Terrapin	26	18	1	M	E	H		P
	3150106240	U. Choccolocco	71	11	1	H	E	X		
	3150107110	U. Hatchet	11	6	1	H	E			S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Alabama clubshells primarily inhabit moderate gradient and swift shallow currents over coarse sand and gravel substrates within runs, riffles, or shoals of small to medium rivers and large to medium sized tributary streams (NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). The breeding season and fish host for the glochidia are unknown. As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Alabama clubshells are thus considered to be sensitive to siltation and altered flows (NatureServe 2003).

Potential Management Effects— If this species is rediscovered or repatriated, potential Forest Service management activities that could influence Alabama clubshells include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve Therefore, Plan implementation could affect individuals, if present, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Moreover, Terrapin Creek is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the species because 1) this species may be extirpated from National Forest habitat and thus, effects on individuals are not likely, 2) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects on historical habitat so that they are insignificant and discountable, and 3) Forest Plan direction encourages actions that may lead to re-introduction of the species and will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Southern kidneyshell (*Ptychobranchus jonesi*)

Distribution, Status, and Trend—The Southern kidneyshell is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003). This species has been identified as a priority 1 species of highest concern (i.e. critically imperiled) within the State of Alabama (ADCNR 2003).

Southern kidneyshell ranges across Alabama and Florida. It is endemic to the Appalachicola, Choctawhatchee, and Escambia Rivers (NatureServe 2003). Currently, the species potentially inhabits one watershed associated with the Conecuh National Forest (Table C.36). Southern kidneyshells may also occur on the Appalachicola National Forest in Florida. The National Forests represent less than 5 percent of the species' range within the State of Alabama.

Table C.36. Conditions of watersheds potentially supporting Southern kidneyshells in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status	Rank[3]	Risk[4]
Conecuh	3140304010	L. Conecuh	4	9	3	L	E	PN		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Southern kidneyshells primarily inhabit low gradient slow currents over stable silt-sand substrates of riffles within medium streams to large rivers (NatureServe 2003). This species is found in greatest abundance in association with woody debris, clean water, and stable substrates (NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). Factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha)*. Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Southern kidneyshells are thus considered to be sensitive to siltation, point source pollution, channelization, barriers, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), the one watershed (Lower Conecuh) exhibits indicators of potential impairment for sediment and water flow with limited opportunities for National Forest management to improve conditions. The one watershed where the species potentially occurs has a condition rating of “excellent” (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Southern kidneyshells include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, remove or alter streamside vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. Implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watershed thought to harbor this species are rated as in “excellent” condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Southern kidneyshell** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Ridged mapleleaf (*Quadrula rumphiana*)

Distribution, Status, and Trend—The ridged mapleleaf is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "critically imperiled" (S1S2) (NatureServe 2003). This species has been identified as a priority 4 species of low concern (i.e. fairly secure) within the State of Alabama (ADCNR 2003).

Ridged mapleleafs are endemic to the Mobile River basin in Alabama, Georgia, Tennessee, and Mississippi. Within Alabama they are found in the Cahaba and Coosa Rivers (NatureServe 2003). Historically, ridged mapleleafs probably ranged throughout the Mobile River basin and its tributaries. Currently, the species potentially inhabits six watersheds associated with the Oakmulgee and main divisions of the Talladega National Forest (Table C.37). Ridged mapleleafs also occur on the Cherokee National Forest in Georgia and Tennessee. The National Forests represent less than 5 percent of the species' range within the State of Alabama. Ridged mapleleafs are generally widespread in their distribution. Where encountered, they are fairly common and in moderate abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.37. Conditions of watersheds potentially supporting ridged mapleleafs in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150105220	U. Terrapin	26	18	1	M	E	CN		P
	3150106240	U. Choccolocco	71	11	1	H	E	PN		
	3150106250	M. Choccolocco	23	21	13	H	BA	PN		**T**
	3150106260	Cheaha	36	19	3	H	E	PN		
	3150106330	Talladega	22	14	5	M	A	PN		P
Oakmulgee	3150202140	Cahaba	11	12		H	E	C		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Ridged mapleleafs primarily inhabit moderate gradient slow to fast currents over sand-gravel substrates within medium sized rivers and reservoirs (NatureServe 2003). This species can tolerate moderately muddy water and may survive impoundment (NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). Factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Ridged mapleleafs are thus considered to be sensitive to point source pollution. According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of six possible watersheds show no indication of potential impairment (Table C.37). The other four watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and temperature, with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are below average in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to siltation originating on downstream private agricultural and residential lands; Forest Plan implementation is not expected to alter these conditions. Overall watershed conditions are rated as “average” in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of “excellent”, a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence ridged mapleleafs include any actions that could increase release toxic chemicals, adjust water chemistry or nutrient cycling, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions in portions of the middle Choccolocco watershed. Moreover, Shoal Creek (upper Choccolocco watershed) is an important habitat area for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised

Forest Plan objectives. However, overall watershed conditions are not likely to improve in the Talladega watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the ridged mapleleaf** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Alabama creekmussel (*Strophitus connasaugaensis*)

Distribution, Status, and Trend—The Alabama creekmussel is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 4 species of low concern (i.e. fairly secure) within the State of Alabama (ADCNR 2003).

Alabama creekmussels are endemic to the Mobile River basin in Alabama, Mississippi, Georgia, and Tennessee. Historically, Alabama creekmussels probably ranged throughout the Coosa and Cahaba drainages. Currently, the species potentially inhabits two watersheds associated with the Oakmulgee and main divisions of the Talladega National Forest (Table C.38). Alabama creekmussels also occur on the Cherokee National Forest in Tennessee and Georgia. The National Forests represent less than 5 percent of the species' range within the State of Alabama. Alabama creekmussels are generally clumped in their distribution. Where encountered, they are generally common and in high abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.38. Conditions of watersheds potentially supporting Alabama creekmussels in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest		Watershed	FS	% ag	rban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150106240	U. Choccolocco	71	11	1	H	E	C		
Oakmulgee	3150202140	Cahaba	11	12		H	E	C		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Alabama creekmussels primarily inhabit areas with little to no currents (ACDNR 2003) within either large tributary streams or small rivers.

Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Alabama creekmussels are thus considered to be sensitive to point source pollution. According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of two possible watersheds show no indication of potential impairment (Table C.38). The other watershed exhibits an indicator of potential impairment for sediment, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of “excellent” (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Alabama creekmussels include any actions that could release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions in the portions of the upper Choccolocco watershed. Moreover, Shoal Creek (upper Choccolocco watershed) is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. Although the watersheds thought to harbor this species are rated as in “excellent” condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Alabama creekmussel** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Southern creekmussel (*Strophitus subvexus*)

Distribution, Status, and Trend—The Southern creekmussel is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 4 species of low concern (i.e. fairly secure) within the State of Alabama (ADCNR 2003).

Southern creekmussels range across a number of southeastern Gulf Coast drainages including the Appalachicola in Florida and Georgia and the Conecuh, Escambia, and Choctawhatchee Rivers in Alabama (NatureServe 2003). They do not appear to inhabit the Yellow River system (NatureServe 2003). Currently, the species potentially inhabits four watersheds associated with the Conecuh National Forest (Table C.39). Southern creekmussels also occur on at least one other National Forest (Appalachicola) within the southeast. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Southern creekmussels are generally widespread in their distribution. Where encountered, they are fairly common and in high abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.39. Conditions of watersheds potentially supporting Southern creekmussels in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	FS	% ag	rban	Road Density	Rating	Status [2]	Rank[3]	Risk
Conecuh	3140104010	Blackwater	49	13	3	L	E	P		
	3140104100	Sweetwater	12	5	2	L	E	P		S
	3140301050	U. Conecuh	3	23	3	M	E	P		S
	3140304010	L. Conecuh	4	9	3	L	E	P		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Southern creekmussels primarily inhabit low to moderate gradient sluggish currents (Deyrup & Franz 1994, ACDNR 2003) over sand-mud substrates within mid channel habitats of small to large headwater streams to medium rivers (NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Southern creekmussels are thus considered to be sensitive to channel modification, point source pollution, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of four possible watersheds show no indication of potential impairment (Table C.39). The other watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Southern creekmussels include any actions that could change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, and block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Southern creekmussel** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Choctaw bean (*Villosa choctawensis*)

Distribution, Status, and Trend—The Choctaw bean is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "imperiled" (G2); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 2 species of high concern (i.e. "imperiled") within the State of Alabama (ADCNR 2003).

Choctaw beans are endemic to the Gulf coastal drainages in Alabama and Florida (NatureServe 2003). Historically, Choctaw beans probably ranged throughout these coastal drainages; however its range is now limited to only the Pea, upper Conecuh, Choctawhatchee, Escambia, and Yellow River systems (ACDNR 2003). Currently, the species potentially inhabits eight watersheds associated with the Conecuh National Forest (Table C.40). Choctaw beans are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 20 percent of the species' range within the State of Alabama. Choctaw beans are endemic and limited in their distribution. Where encountered, they are generally rare and in low abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.40. Conditions of watersheds potentially supporting Choctaw beans in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	R		S
	3140103070	Yellow-Watkins	14	21	1	M	E	R		S
	3140103080	Five Runs	21	34	5	M	E	R		
	3140103090	Yellow-Givens	12	21	1	L	E	R		S
	3140104010	Blackwater	49	13	3	L	E	R		
	3140104100	Sweetwater	12	5	2	L	E	R		S
	3140301050	U. Conecuh	3	23	3	M	E	R		S
	3140304010	L. Conecuh	4	9	3	L	E	R		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Choctaw beans primarily inhabit slow to moderate currents over sand-silt substrates in riffles of large streams and small to medium rivers (NatureServe 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Choctaw beans are considered to be sensitive to point source pollution, barriers, channelization, exotic species, eutrophication, and altered flows (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of eight possible watersheds show no indication of potential impairment (Table C.40). The other six watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as “average” in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of “excellent”, a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Choctaw beans include any actions that could change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the upper Yellow watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow and Conecuh Rivers where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Choctaw bean** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Alabama rainbow (*Villosa nebulosa*)

Distribution, Status, and Trend—The Alabama rainbow is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as “vulnerable” (G3); within Alabama, the species is ranked as “vulnerable” (S3) (NatureServe 2003). This species has been identified as a priority 3 species of moderate concern (i.e. limited info &/or fairly secure) within the State of Alabama (ADCNR 2003).

Alabama rainbows range across five Appalachian southeastern states (NatureServe 2003). Within Alabama, Alabama rainbows are found within the Mobile River Basin above the fall line (ACDNR 2003). Currently, the species potentially inhabits eight watersheds associated with the Bankhead National Forest and the Oakmulgee and main division of the Talladega National Forest (Table C.41). Alabama rainbows also occur on the Cherokee National Forest in Georgia and Tennessee. The National Forests represent approximately 10 percent of the species’ range within the State of Alabama. Alabama rainbows are generally scattered in their distribution. Where encountered, they are uncommon and in low abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.41. Conditions of watersheds potentially supporting Alabama rainbows in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150105220	U. Terrapin	26	18	1	M	E	U		P
	3150105240	Hurricane	6	14	1	L	E	U		SP

	3150106240	U. Choccolocco	71	11	1	H	E	U		
	3150107110	U. Hatchet	11	6	1	H	E	U		S
Oakmulgee	3150202140	Cahaba	11	12		H	E	U		S
Bankhead	3160110020	L. Sipsey Fork	32	7	1	M	E	U		F
	3160110030	U. Brushy	82	2		L	E	U		
	6030002350	L. Flint	<1				BA	U		SPT

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Alabama rainbows primarily inhabit small headwater streams (ACDNR 2003). This species appears to utilize a number of bass species as their glochidial host (Haag & Warren 1997). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Alabama rainbows are thus considered to be sensitive to siltation, point source pollution, warming water temperatures, barriers, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of eight possible watersheds show no indication of potential impairment (Table C.41). The other six watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, temperature, and water flow, with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Lower Flint). This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural lands; Forest Plan implementation is not expected to alter these conditions, especially since Forest Service lands compose less than 1% of the watershed. The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Alabama rainbows include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, block fish passage, elevate temperatures, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in the upper Choccolocco watershed. Moreover, upper Choccolocco, Terrapin, and upper Hatchet, and Sipsey Fork are important watersheds for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the lower Flint watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the lower Flint, Hurricane, upper Hatchet, and Cahaba watersheds where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Alabama rainbow** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

Coosa combshell (creekshell) (*Villosa vanuxemensis umbrans*)

Distribution, Status, and Trend—The Coosa combshell is considered at risk of population decline according to Williams et al. (1992). Globally the species is ranked as "apparently secure" (G4T2); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003). This species has been identified as a priority 2 species of high concern (i.e. "imperiled") within the State of Alabama (ADCNR 2003).

Coosa combshells are endemic to the Mobile River basin and range across Georgia, Alabama, and Tennessee above the fall line. Currently, the species potentially inhabits four watersheds associated with the Oakmulgee and main divisions of the Talladega National Forest (Table C.42). Coosa combshells may occur on several other National Forest management units within the southeast. The National Forests represent less than 5 percent of the species' range within the State of Alabama. Coosa combshells are widespread in their distribution within tributaries above the fall line (ACDNR 2003). Where encountered, they are generally rare and in low abundance (Metee et al. 1996, Smith et al. 2002, ACDNR 2003).

Table C.42. Conditions of watersheds potentially supporting Coosa combshells in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	**HUC code**	**Watershed**	**% FS**	**% ag**	**%urban**	**Road Density**	**Rating[1]**	**Status[2]**	**Rank[3]**	**Risk**
Talladega	3150105220	U. Terrapin	26	18	1	M	E	R		P
	3150105240	Hurricane	6	14	1	L	E	R		SP
	3150106250	M. Choccolocco	23	21	13	H	BA	R		**T**
Oakmulgee	3150202140	Cahaba	11	12		H	E	R		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Coosa combshells inhabit large tributary and headwater streams and rivers (ACDNR 2003). Freshwater mussels are filter feeders taking organic detritus, diatoms, phytoplankton, and zooplankton from the water column (Neves et al. 1996). Predation is normally a minor mortality factor, with the exception of localized areas where muskrats, otters, and some types of turtles and fish may limit population growth. Parasites and disease are not normally limiting factors or viability concerns; however mussels under environmental stress may be at greater risk for decline in health, growth, longevity, and fertility (Zale & Neves 1982). Most mussels are long-lived and late maturing, potentially masking evidence of population declines and viability problems (Neves & Moyer 1988). As with many other freshwater mussels, this species probably requires clean gravel riffles, low turbidity, and some water flow. Other factors that can negatively impact freshwater mussels include contamination of waterways with pesticides, heavy metals, and other substances and the competition of nonindigenous mollusks, such as the Asian clam and zebra mussel (*Dreissena polymorpha).* Mussels are particularly sensitive to channel alterations since substrate qualities such as particle composition, consolidation, oxygen levels, subsurface flow, and susceptibility to souring or deposition can change dramatically with relatively small adjustments in channel dimensions or structural components (Brim Box & Moosa 1999). Logs, stumps, and brush appear to create pockets of some of the most stable refugia areas for mussels during floods and drought (Pierson 1991). Coosa combshells are thus considered to be sensitive to siltation, point source pollution, and altered flows. According to the recent assessment of National Forest watersheds (Leftwich 2003), the four watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and temperature with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Coosa combshells include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or block fish passage. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions within portions of the middle Choccolocco watershed. Moreover, Terrapin Creek is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the Hurricane and Cahaba watersheds where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Coosa combshell** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, improve water quality, and remove barriers to movements, resulting in conservation of the species.

A caddisfly (*Cheumatopsyche bibbensis*)

Distribution, Status, and Trend—Globally the species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Cheumatopsyche bibbensis are endemic to the Cahaba River basin in Alabama. They are known only from Bibb County. Currently, the species potentially inhabits three watersheds associated with the Oakmulgee Division of the Talladega National Forest (Table C.43). *Cheumatopsyche bibbensis* are not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. *Cheumatopsyche bibbensis* are generally disjunct in their distribution and sparse in their abundance.

Table C.43. Conditions of watersheds potentially supporting *Cheumatopsyche bibbensis* in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank	Risk[4]
Oakmulgee	3150202120	Affonee	24	10	1	M	E	S		
	3150202130	Gully	24	7	1	M	E	S		
	3160113030	Big Sandy	30	5	<1	M	E	S		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Information is lacking on this species (NatureServe 2003). It is likely an inhabitant of both tributary streams and the mainstem Cahaba River. Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, *Cheumatopsyche bibbensis* may be sensitive to siltation, point source pollution, altered flows, and loss or modification of riparian vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), none of the watersheds show an indication of potential impairment (Table C.43). All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence *Cheumatopsyche bibbensis* include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, or modify riparian vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for *Cheumatopsyche bibbensis*** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Helma's net-spinning caddisfly (*Cheumatopsyche helma*)

Distribution, Status, and Trend—Globally this caddisfly is ranked as "critically imperiled" (G1G3). Within Alabama, Helma's net-spinning caddisflies are ranked as "critically imperiled" (S1) (NatureServe 2003).

Helma's net-spinning caddisflies range across Alabama, Tennessee, Kentucky, and Pennsylvania. Within Alabama, they are reported in the upper and middle Coosa River basin within Clay and DeKalb Counties. Currently, the species potentially inhabits three watersheds associated with the Talladega National Forest (Table C.44). Helma's net-spinning caddisflies also occur on at least two other National Forests within the southeastern United States. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Helma's net-spinning caddisflies are generally scattered in their distribution and sparse in their abundance.

Table C.44. Conditions of watersheds potentially supporting Helma's net-spinning caddisflies in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150106260	Cheaha	36	19	3	H	E	S		
	3150106330	Talladega	22	14	5	M	A	S		P
	3150107010	Tallaseehatchee	22	21	5	M	BA	S		PTF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Helma's net-spinning caddisflies are bottom dwellers within small headwater streams (NatureServe 2003). The adults appear to inhabit wooded ridge tops. Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, Helma's net-spinning caddisflies may be sensitive to siltation, point source pollution, altered flows, and loss or modification of riparian vegetation and ridge-top trees. According to the recent assessment of National Forest watersheds (Leftwich 2003), one of three possible watersheds shows no indication of potential impairment (Table C.44). The other two watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, temperature, and water flow, with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Tallaseehatchee in the Talladega District). This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watershed where the species potentially occurs has a condition rating of “excellent”, a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Helma’s net-spinning caddisflies include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, modify habitat structure, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

There could also be impacts on terrestrial habitats that may be important to this species. These negative effects are expected to be primarily short-term, however, as ridge-top and rocky outcrop habitats adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain “moderately high” for all action alternatives. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the Talladega and Tallaseehatchee watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Helma’s net-spinning caddisfly** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Say's spiketail (*Cordulegaster sayi*)

Distribution, Status, and Trend—Globally this dragonfly is ranked as "imperiled" (G2); within Alabama, the species is ranked as "critically imperiled" (S1S2) (NatureServe 2003).

Say's spiketails are reported within the Yellow River in Florida and within the Oklawaha and Apalachicola River basins in Georgia. Currently, the species potentially inhabits eight watersheds associated with the Conecuh National Forest (Table C.45). Say's spiketails also occur on the Apalachicola National Forest in Florida. The National Forests represent approximately 40 percent of the species' range within the State of Alabama.

Table C.45. Conditions of watersheds potentially supporting Say's spiketails in or within five miles of the National Forests in Alabama.

Forest	HUC code	Watershed	Watershed Conditions					Viability		
			% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank	Risk[4]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	P		S
	3140103070	Yellow-Watkins	14	21	1	M	E	P		S
	3140103080	Five Runs	21	34	5	M	E	P		
	3140103090	Yellow-Givens	12	21	1	L	E	P		S
	3140104010	Blackwater	49	13	3	L	E	P		
	3140104100	Sweetwater	12	5	2	L	E	P		S
	3140301050	U. Conecuh	3	23	3	M	E	P		S
	3140304010	L. Conecuh	4	9	3	L	E	P		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Say's spiketails primarily inhabit weedy muck substrates of seeps and springs within deciduous forests (NatureServe 2003) and within bogs and baygall thickets (Needham et al 2000). They prey predominantly on wasps and bees (Dunkle 1989). Say's spiketails are considered to be sensitive to erosion and soil disturbance, direct trampling, water temperatures, point source pollution, altered flows, and loss of snags and riparian canopy vegetation (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), two of eight possible watersheds show no indication of potential impairment (Table C.45). The other six watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Say's spiketails include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, elevate temperatures, and remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian and upland habitats also important to this species. However, there could be short-term impacts to seep and spring habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high" for all action alternatives. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the Yellow watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow and Conecuh Rivers where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or**

loss of viability for the Say's spiketail because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Robust baskettail (*Epitheca spinosa*)

Distribution, Status, and Trend—Globally this dragonfly is ranked as "vulnerable" (G3G4); within Alabama, the species is ranked as "vulnerable" (S3S4) (NatureServe 2003).

Robust baskettails range across the eastern United States (NatureServe 2003). Within Alabama they are known from Covington and Tuscaloosa Counties (Tennessen 1995). They have been collected from the Blackwater drainage on the Conecuh National Forest (Krotzer & Krotzer 1994a). Currently, the species potentially inhabits eight watersheds associated with the Conecuh National Forest (Table C.46). Robust baskettails may occur on several other National Forest management units within the southeast. The National Forests represent an unknown percent of the species' range within the State of Alabama. Robust baskettails are generally scattered in their distribution and rare in abundance (Tennessen 1995).

Table C.46. Conditions of watersheds potentially supporting robust baskettails in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest		Watershed	FS	% ag	rban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk
Conecuh	3140103050	U. Yellow	2	44	4	M	A	P		S
	3140103070	Yellow-Watkins	14	21	1	M	E	P		S
	3140103080	Five Runs	21	34	5	M	E	P		
	3140103090	Yellow-Givens	12	21	1	L	E	P		S
	3140104010	Blackwater	49	13	3	L	E	R		
	3140104100	Sweetwater	12	5	2	L	E	P		S
	3140301050	U. Conecuh	3	23	3	M	E	P		S
	3140304010	L. Conecuh	4	9	3	L	E	P		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Robust baskettails primarily inhabit stagnant to sluggish currents within wooded swamps and bogs (Krotzer & Krotzer 1994a, Tennessen 1995, NatureServe 2003). They are found in greatest abundance in association with overhanging or emergent vegetation (Dunkle 1989). They fly in March (Krotzer & Krotzer 1999). Robust baskettails are thus considered to be sensitive to point source pollution, altered flows, and loss of riparian or aquatic vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), two of eight possible watersheds show no indication of potential impairment (Table C.46). The other six watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence robust baskettails include any actions that could change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is unlikely to negatively affect this species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian and upland habitats also important to this species. However, there could be short-term impacts to swamp and bog habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high" for all action alternatives. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the upper Yellow watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow and Conecuh Rivers where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the robust baskettail** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Twin-striped clubtail (*Gomphus geminatus*)

Distribution, Status, and Trend—Globally this dragonfly species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "vulnerable" (S3?) (NatureServe 2003).

Twin-striped clubtails range across Alabama, Florida, and Georgia (NatureServe 2003). Within Alabama, they are only found within the extreme southern portion of the coastal plain (Krotzer & Krotzer 1994a) within Escambia County (Tennessen 1995). They have been collected from the Sweetwater watershed within the Conecuh National Forest (Krotzer & Krotzer 1994a). Currently, the species potentially inhabits eight watersheds associated with the Conecuh National Forest (Table C.47). Twin-striped clubtails may occur on several other National Forest management units within the southeast. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Twin-striped clubtails are generally scattered in their distribution and rare in their abundance (Tennessen 1995, Smith et al. 2002).

Table C.47. Conditions of watersheds potentially supporting twin-striped clubtails in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	P		S
	3140103070	Yellow-Watkins	14	21	1	M	E	P		S
	3140103080	Five Runs	21	34	5	M	E	P		
	3140103090	Yellow-Givens	12	21	1	L	E	P		S
	3140104010	Blackwater	49	13	3	L	E	P		
	3140104100	Sweetwater	12	5	2	L	E	R		S
	3140301050	U. Conecuh	3	23	3	M	E	P		S
	3140304010	L. Conecuh	4	9	3	L	E	P		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Twin-striped clubtails primarily inhabit moderate currents over sand and silt substrates within small headwater streams (Krotzer & Krotzer 1994a, Tennessen 1995, NatureServe 2003). This species is found in greatest abundance in association with silt and shrubs (NatureServe 2003). They are intolerant of pollution, and insecticides (Corbet 1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults (April; Krotzer & Krotzer 1999); during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, twin-striped clubtails may be sensitive to point source pollution and loss or modification of aquatic or riparian vegetation (including early successional or mid-story shrubs) (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of eight possible watersheds show no indication of potential impairment (Table C.47). The other six watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence twin-striped clubtails include any actions that could release toxic chemicals, or alter mid-story or early successional riparian vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is not likely to adversely affect this species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the canebrakes, glades and barrens, and early successional riparian habitats also important to this species. Furthermore, Forest Plan direction includes objectives for maintaining or restoring early successional riparian habitat. However, there could be short-term impacts to terrestrial habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "high" for all action alternatives. Species viability risks will remain constant, primarily due to the rarity of these communities and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the upper Yellow watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow and Conecuh Rivers where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the twin-striped clubtail** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Hodges' clubtail (*Gomphus hodgesi*)

Distribution, Status, and Trend—Globally this dragonfly species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "vulnerable" (S3?) (NatureServe 2003).

Hodges' clubtails range throughout the Gulf Coast of the southeastern United States (NatureServe 2003). Within Alabama, they are known from Baldwin, Covington, and Escambia Counties (Tennessen 1995). They have been collected within the Sweetwater, upper Conecuh, Blackwater, and Five Runs watersheds on the Conecuh National Forest (Krotzer & Krotzer 1994a). Currently, the species potentially inhabits eight watersheds associated with the Conecuh National Forest (Table C.48). Hodges' clubtails may occur on several other National Forest management units within the southeast. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Hodges' clubtails are generally rare in their abundance.

Table C.48. Conditions of watersheds potentially supporting Hodges' clubtails in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code		% FS	% ag	rban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	P		S
	3140103070	Yellow-Watkins	14	21	1	M	E	P		S
	3140103080	Five Runs	21	34	5	M	E	S		
	3140103090	Yellow-Givens	12	21	1	L	E	P		S
	3140104010	Blackwater	49	13	3	L	E	S		
	3140104100	Sweetwater	12	5	2	L	E	S		S
	3140301050	U. Conecuh	3	23	3	M	E	S		S

	3140304010	L. Conecuh	4	9	3	L	E	P		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Hodges' clubtails primarily inhabit moderate currents over sand and silt substrates within small forested streams (NatureServe 2003). This species is found in greatest abundance in association with silt deposits and riparian forests (NatureServe 2003). They are intolerant of pollution, and insecticides (Corbet 1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults (April-May; Krotzer & Krotzer 1999); during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, Hodge's clubtails may be sensitive to point source pollution and loss or modification of aquatic or riparian overstory vegetation (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of eight possible watersheds show no indication of potential impairment (Table C.48). The other six watersheds exhibit combinations of indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Hodges' clubtails include any actions that could release toxic chemicals, or remove riparian overstory vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation is not likely to contribute to adverse impacts on this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. However, overall watershed conditions are not likely to improve in the upper Yellow watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the mainstem Yellow and Conecuh Rivers where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Hodges' clubtail** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Cocoa clubtail (*Gomphus hybridus*)

Distribution, Status, and Trend—Globally this dragonfly species is ranked as "apparently secure" (G4); within Alabama, the species is ranked as "vulnerable" (S3S4) (NatureServe 2003).

Cocoa clubtails range throughout the eastern United States (NatureServe 2003). Within Alabama, they are known to inhabit Baldwin, Bibb, Choctaw, Clarke, Conecuh, Dallas, Elmore, Escambia, Greene, Hale, Jackson, Monroe, Perry, Sumter, Tuscaloosa, and Wilcox Counties (Tennessen et al. 1995). They have been collected on the Talladega and Oakmulgee Districts of the Talladega National Forest (Krotzer & Krotzer 1996, Krotzer & Krotzer 1999). Currently, the species potentially inhabits four watersheds associated with the Conecuh National Forest and the Oakmulgee Division of the Talladega National Forest (Table C.49). Cocoa clubtails may occur on several other National Forest management units elsewhere in the United States. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Cocoa clubtails are generally uncommon, but may be locally common in some areas (Tennessen et al. 1995).

Table C.49. Conditions of watersheds potentially supporting cocoa clubtails in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140301050	U. Conecuh	3	23	3	M	E	P		S
Oakmulgee	3150202120	Affonee	24	10	1	M	E	P		
	3150202130	Gully	24	7	1	M	E	R		

	3160113030	Big Sandy	30	5	<1	M	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Cocoa clubtails primarily inhabit sand-silt substrates within medium to large rivers (Tennessen et al. 1995, NatureServe 2003). They are intolerant of pollution, and insecticides (Corbet 1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults (April; Krotzer & Krotzer 1999); during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, Cocoa clubtails may be sensitive to point source pollution and loss or modification of aquatic or riparian vegetation (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), three out of four possible watersheds show no indication of potential impairment (Table C.49). The watershed exhibits an indicator of potential impairment for sediment with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of “excellent” (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence cocoa clubtails include any actions that could release toxic chemicals, modify habitat structure, or alter aquatic or riparian vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is not likely to adversely affect this species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats also important to this species. However, there could be short-term impacts to terrestrial habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain “high” for all action alternatives. Species viability risks will remain constant, primarily due to the rarity of these communities and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the cocoa clubtail** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

A caddisfly (*Hydropsyche hageni*)

Distribution, Status, and Trend—Globally this caddisfly species is ranked as "secure" (G5); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003).

Hydropsyche hageni range across the eastern United States and are found within Alabama in the Cahaba River above the fall line (Harris et al. 1991). Currently, the species potentially inhabits one watershed associated with the Oakmulgee Division of the Talladega National Forest (Table C.50). This species may occur on several other National Forest management units elsewhere in the United States. The National Forests represent less than 5 percent of the species' range within the State of Alabama. *Hydropsyche hageni* are generally endemic in their distribution and rare in their abundance.

Table C.50. Conditions of watersheds potentially supporting *Hydropsyche hageni* in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest		Watershed	FS	% ag	rban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Oakmulgee	3150202140	Cahaba	11	12		H	E	PN		S

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Information is lacking on this species (NatureServe 2003). However, if it is similar to other members of its genus, it probably inhabits small sandy streams. Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, *Hydropsyche hageni* may be sensitive to siltation, point source pollution, altered flows, and loss or modification of riparian vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), the one watershed (Cahaba) exhibits an indicator of potential impairment for sediment with limited opportunities for National Forest management to improve conditions. The one watershed where the species potentially occurs has a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence *Hydropsyche hageni* include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. Implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watershed thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for *Hydropsyche hageni*** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

A caddisfly (*Hydroptila cheaha*)

Distribution, Status, and Trend—Globally this caddisfly is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Hydroptila cheaha are endemic to the middle Coosa River basin in Talladega County, Alabama. Currently, the species is known from one watershed (Cheaha) and potentially inhabits three watersheds associated with the Talladega National Forest (Table C.51). This species is not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 30 percent of the species' range within the State of Alabama. *Hydroptila cheaha* are generally endemic in their distribution and sparse in their abundance.

Table C.51. Conditions of watersheds potentially supporting *Hydroptila cheaha* in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code		% FS	% ag	%urban	Road Density	Rating	Status [2]	Rank [3]	Risk [4]
Talladega	3150106250	M. Choccolocco	23	21	13	H	BA	P		**T**
	3150106260	Cheaha	36	19	3	H	E	P		
	3150106330	Talladega	22	14	5	M	A	S		P
	3150107010	Tallaseehatchee	22	21	5	M	BA	P		PTF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Information is lacking on this species (NatureServe 2003). However, if this species is similar to other members of its genus, it may inhabit springs and small spring-fed streams. Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, *Hydroptila cheaha* may be sensitive to siltation or turbidity, point source pollution, temperature increases, altered flows, and loss or modification of riparian vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of four possible watersheds show no indication of potential impairment (Table C.51). The other three watersheds exhibit combinations of indicators of potential impairment for point source pollution, temperature, and water flow with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. Overall watershed conditions are rated as "average" in one of the watersheds (Clingenpeel 2003). The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence *Hydroptila cheaha* include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, elevate temperatures, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in two watersheds, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions within portions of the middle Choccolocco watershed. However, overall watershed conditions are not likely to improve in the middle Choccolocco, Talladega, and Tallaseehatchee watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for *Hydroptila cheaha*** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

A caddisfly (*Hydroptila choccolocco*)

Distribution, Status, and Trend—Globally this caddisfly species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Hydroptila choccolocco are endemic to the lower to middle Coosa River basin in Alabama. Currently, the species potentially inhabits two watersheds associated with the Talladega National Forest (Table C.52). This species is not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 30 percent of the species' range within the State of Alabama. *Hydroptila choccolocco* are generally clumped in their distribution. Where encountered, they are generally locally common (Metee et al. 1996, Smith et al. 2002, ACDNR 2003). .

Table C.52. Conditions of watersheds potentially supporting *Hydroptila choccolocco* in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	g[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150106240	U. Choccolocco	71	11	1	H	E	L		
	3150106250	M. Choccolocco	23	21	13	H	BA	L		**T**

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Information is lacking on this species (NatureServe 2003). However, if this species is similar to other members of its genus, it may inhabit springs and small spring-fed streams. Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, *Hydroptila choccolocco* may be sensitive to siltation, point source pollution, increased temperatures, altered flows, and loss or modification of riparian vegetation.

According to the recent assessment of National Forest watersheds (Leftwich 2003), one out of two possible watersheds show no indication of potential impairment (Table C.52). The other watershed (Middle Choccolocco) exhibits an indicator of potential impairment for temperature with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are “below average” in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. The other watershed where the species potentially occurs has a condition rating of “excellent”, a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence *Hydroptila choccolocco* include any actions that could increase sedimentation, siltation, or turbidity, elevate temperatures, change water flow, release toxic chemicals, modify habitat structure, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain “moderately high”regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions within portions of the middle Choccolocco watershed. Moreover, the upper Choccolocco drainage is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the middle Choccolocco watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for *Hydroptila choccolocco*** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

A caddisfly (*Hydroptila paralatosa*)

Distribution, Status, and Trend—Globally this caddisfly species is ranked as "imperiled" (G2); within Alabama, the species is ranked as "imperiled" (S2) (NatureServe 2003).

Hydroptila paralatosa are endemic to Alabama and specifically the Sipsey and Black Warrior Rivers in the upper Alabama River basin. Currently, the species potentially inhabits two watersheds associated with the Oakmulgee Division of the Talladega National Forest (Table C.53). This species is not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent less than 5 percent of the species' range within the State of Alabama. *Hydroptila paralatosa* are generally endemic in their distribution and sparse in their abundance.

Table C.53. Conditions of watersheds potentially supporting *Hydroptila paralatosa* in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	rban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Oakmulgee	3160113030	Big Sandy	30	5	<1	M	E	S		
	3160113060	Elliotts	40	19	1	H	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Information is lacking on this species (NatureServe 2003). *Hydroptila paralatosa* primarily inhabits small streams near the transition of the fall line. Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, *Hydroptila paralatosa* may be sensitive to siltation, point source pollution, altered flows, and loss or modification of riparian vegetation. According to the recent assessment of National

Forest watersheds (Leftwich 2003), none of the possible watersheds show indication of potential impairment (Table C.53). All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence *Hydroptila paralatosa* include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for *Hydroptila paralatosa*** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

A caddisfly (*Hydroptila patriciae*)

Distribution, Status, and Trend—Globally this caddisfly species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Hydroptila patriciae are endemic to Alabama and restricted to the middle Coosa, Cahaba, and Locust River basins. Currently, the species potentially inhabits four watersheds associated with the Oakmulgee and main divisions of the Talladega National Forest (Table C.54). This species is not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. *Hydroptila patriciae* are generally endemic in their distribution and sparse in their abundance.

Table C.54. Conditions of watersheds potentially supporting *Hydroptila patriciae* in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank	Risk[4]
Talladega	3150106240	U. Choccolocco	71	11	1	H	E	P		
	3150106250	M. Choccolocco	23	21	13	H	BA	P		T
Oakmulgee	3150202120	Affonee	24	10	1	M	E	P		
	3150202130	Gully	24	7	1	M	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Information is lacking on this species (NatureServe 2003). Presumably they inhabit small streams. Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, *Hydroptila patriciae* may be sensitive to siltation, point source pollution, altered flows, and loss or modification of riparian vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), three out of four possible watersheds show no indication of potential impairment (Table C.54). The other watershed (Middle Choccolocco) exhibits an indicator of potential impairment for temperature with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence *Hydroptila patriciae* include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions within portions of the middle Choccolocco watershed. Moreover, the upper Choccolocco drainage is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the middle Choccolocco watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for *Hydroptila patriciae*** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2)

Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

A caddisfly (*Hydroptila setigera*)

Distribution, Status, and Trend—Globally this caddisfly species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Hydroptila setigera are endemic to the middle Coosa River basin in Alabama. Currently, the species potentially inhabits two watersheds associated with the Talladega National Forest (Table C.55). This species is not known to occur on any other National Forest management units within the southeast or elsewhere in the United States. The National Forests represent approximately 20 percent of the species' range within the State of Alabama. *Hydroptila setigera* are disjunct in their distribution and sparse in abundance.

Table C.55. Conditions of watersheds potentially supporting *Hydroptila setigera* in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk
Talladega	3150106240	U. Choccolocco	71	11	1	H	E	P		
	3150106250	M. Choccolocco	23	21	13	H	BA	S		**T**
	3150106260	Cheaha	36	19	3	H	E	P		
	3150106330	Talladega	22	14	5	M	A	P		P

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—*Hydroptila setigera* primarily inhabits small headwater streams of the lower Appalachian Mountains (Harris et al. 1991). Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, *Hydroptila setigera* may be sensitive to siltation, point source pollution, increased temperatures, altered flows, and loss or modification of riparian vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), two of the four watersheds show no indication of potential impairment (Table C.55). The middle Choccolocco and Talladega watersheds may be impaired due to temperature and point-source pollution, respectively. Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. The other watersheds where the species potentially occurs have a condition rating of “excellent”, a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence *Hydroptila setigera* include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, or removal of riparian vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain “moderately high”regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions within portions of the middle Choccolocco watershed. Moreover, the upper Choccolocco drainage is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the middle Choccolocco and Talladega watersheds, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for *Hydroptila setigera*** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Smokey showdragon (*Neurocordulia molesta*)

Distribution, Status, and Trend—Globally this dragonfly species is ranked as "vulnerable" (G3G4); within Alabama, the species is ranked as "vulnerable" (S3) (NatureServe 2003).

Smokey showdragons range across eastern North America (NatureServe 2003). Within Alabama they are known from Baldwin, Colbert, Elmore, Greene, Jackson, Lauderdale, Monroe, Perry, Sumter, and Tuscaloosa Counties (Tennessen 1995). They have been collected on the Tuskegee National Forest (Krotzer & Krotzer 1997b, Krotzer & Krotzer 1999). Currently, the species potentially inhabits two watersheds associated with the Tuskegee National Forest (Table C.56). Smokey showdragons may occur on several other National Forest management units elsewhere in the United States. The National Forests represent an unknown percent of the species' range within the State of Alabama. Smokey showdragons are generally uncommon in their abundance but they may be locally common within some areas (Tennessen 1995).

Table C.56. Conditions of watersheds potentially supporting smokey showdragons in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	FS	% ag	%urban	Road Density	Rating[1]	Status[2]	k[3]	Risk[4]
Tuskegee	3150110050	Chewacla	1	24	7	L	A	P	F1	SPF
	3150110070	Uphapee	10	38	5	H	A	U		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Smokey showdragons primarily inhabit large streams and rivers (Tennessen 1995, NatureServe 2003). This species is found in greatest abundance in association with rocks and large woody debris (NatureServe 2003). They are intolerant of pollution, and insecticides (Corbet 1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults; during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, smokey showdragons may be sensitive to point source pollution, reduction in large woody debris, or loss or modification of aquatic or riparian vegetation (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), both watersheds exhibit combinations of indicators of potential impairment for sediment, point source pollution, and water flow with limited opportunities for National Forest management to improve conditions. Overall watershed conditions are rated as "average" in both of the watersheds (Clingenpeel 2003) and these conditions will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence smokey showdragons include any actions that could release toxic chemicals, remove or alter aquatic and riparian vegetation, or limit large woody debris. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the river channel and terrace habitats important to this species. According to the terrestrial viability assessment (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "very high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation is unlikely to contribute to adverse impacts and may benefit this species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved watershed conditions in Uphapee Creek. Moreover, Uphapee is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the Chewacla watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the smokey showdragon** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Morse's long-horn sedge (*Oecetis morsei*)

Distribution, Status, and Trend—Globally this caddisfly species is ranked as "imperiled" (G2); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Morse's long-horn sedges range across the coastal plains and sandhills of Alabama, Florida, and South Carolina (NatureServe 2003). Within Alabama, it is restricted to small tributary streams of the Cahaba River within the transitional zone of the fall line (Harris et al. 1991). Currently, the species potentially inhabits two watersheds associated with the Oakmulgee Division of the Talladega National Forest (Table C.57). Morse's long-horn sedges may occur on several other National Forest management units within the southeast. The National Forests represent approximately 40 percent of the species' range within the State of Alabama. Morse's long-horn sedges are generally endemic in their distribution and rare in their abundance.

Table C.57. Conditions of watersheds potentially supporting *Oecetis morsei* in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Oakmulgee	3150202120	Affonee	24	10	1	M	E	P		
	3150202130	Gully	24	7	1	M	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Morse's long-horn sedge primarily inhabits sand substrates within small streams (NatureServe 2003) in and around the fall line transition (Harris et al. 1991). Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, Morse's long-horn sedge may be sensitive to siltation, point source pollution, increased temperatures, altered flows, and loss or modification of riparian vegetation (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), neither watershed shows an indication of potential impairment (Table C.57). Both watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Morse's long-horn sedges include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Morse's long-horn sedge** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Alleghany snaketail (*Ophiogomphus incurvatus alleghaniensis*) -- Sensitive

Distribution, Status, and Trend—Globally this dragonfly species is ranked as "vulnerable" (G3Q); within Alabama, the species is ranked as "critically imperiled" (S1S2) (NatureServe 2003).

Alleghany snaketails range throughout the piedmont of the southeastern United States (NatureServe 2003). They have been collected within the upper Choccolocco and Terrapin watersheds on the Shoal Creek Ranger District of the Talladega National Forest (Krotzer & Krotzer 1994b). Currently, the species potentially inhabits five watersheds associated with the Oakmulgee and main divisions of the Talladega National Forest (Table C.58). Alleghany snaketails also occur in at least one, and possible several other National Forests within the southeast. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Alleghany snaketails are generally patchy in their distribution and sparse to common in their abundance.

Table C.58. Conditions of watersheds potentially supporting Alleghany snaketails in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank	Risk[4]
Talladega	3150105220	U. Terrapin	26	18	1	M	E	S	F1	P
	3150106240	U. Choccolocco	71	11	1	H	E	C		
	3150106250	M. Choccolocco	23	21	13	H	BA	P		**T**
	3150108090	Cane	19	5	2	H	E	P		
Oakmulgee	3160113030	Big Sandy	30	5	<1	M	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Alleghany snaketails primarily inhabit flowing currents over cobble-gravel-mud substrates within shallow riffles of spring-fed small to medium sized "pristine" streams (Carle 1992, NatureServe 2003). It is found in greatest abundance in association with clear water, fairly stable coarse sand and gravel, open grassy stream banks, and emergent cobble and boulders (Needham et al. 2000). They are intolerant of pollution, and insecticides (Corbet 1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults; during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, Alleghany snaketails may be sensitive to sedimentation, turbidity, point source pollution, channel modification, elevated temperatures, and loss or modification of fairly open riparian patches of sedges or grasses (Needham et al. 2000, NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of five watersheds show indications of potential impairment (Table C.58). Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to fine sediments eroding from downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Alleghany snaketails include any actions that could increase sedimentation, siltation, or turbidity, change water flow, release toxic chemicals, modify habitat structure, elevate temperatures, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the canebrakes, glades and barrens, and early successional riparian habitats also important to this species. Furthermore, Forest Plan direction includes objectives for maintaining or restoring early successional riparian habitat. However, there could be short-term impacts to terrestrial habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high" for all action alternatives. Species viability risks will remain constant, primarily due to the rarity of these communities and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions within portions of the middle Choccolocco watershed. Moreover, the Terrapin and upper Choccolocco drainages are important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the middle Choccolocco watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the middle Choccolocco watershed where elevated temperature has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Alleghany snaketail** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Appalachian snaketail (*Ophiogomphus incurvatus*)

Distribution, Status, and Trend—Globally this dragonfly species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "unknown" (S?) (NatureServe 2003).

Appalachian snaketails range across the Appalachian Mountains and piedmont areas of the southeastern United States (NatureServe 2003). Currently, the species potentially inhabits four watersheds associated with the Talladega National Forest (Table C.59). Appalachian snaketails occur in at least two other National Forests in the southeast. The National Forests represent approximately 10 percent of the species' range within the State of Alabama. Appalachian snaketails are generally widespread in their distribution and sparse in their abundance.

Table C.59. Conditions of watersheds potentially supporting Appalachian snaketails in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150105220	U. Terrapin	26	18	1	M	E	P		P
	3150105240	Hurricane	6	14	1	L	E	P		SP
	3150106240	U. Choccolocco	71	11	1	H	E	P		
	3150106250	M. Choccolocco	23	21	13	H	BA	P		**T**

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Appalachian snaketails primarily inhabit clear flowing currents over sand and gravel substrates within riffles of piedmont streams (NatureServe 2003). They are intolerant of pollution, and insecticides (Corbet 1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults; during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, Appalachian snaketails may be sensitive to siltation, turbidity, point source pollution, altered flow, modified channel structure, or loss or modification of riparian vegetation (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of four possible watersheds show no indication of potential impairment (Table C.59). The other two watersheds exhibit combinations of indicators of potential impairment for sediment and point source pollution with limited opportunities for National Forest management to improve conditions. Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to fine sediments eroding from downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Appalachian snaketails include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, modify habitat structure, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats also important to this species. However, there could be short-term impacts to terrestrial habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high" for all action alternatives. Species viability risks will remain constant, primarily due to the rarity of these communities and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions within the middle Choccolocco watershed. Moreover, Terrapin and upper Choccolocco drainages are important watersheds for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. However, overall watershed conditions are not likely to improve in the middle Choccolocco watershed, as these conditions will continue to be caused by off-Forest factors beyond Forest Service control. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the Hurricane watershed where excessive siltation has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Appalachian snaketail** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Carlson's Polycentropus caddisfly (*Polycentropus carlsoni*)

Distribution, Status, and Trend—Globally the species is ranked as "critically imperiled" (G1G3); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Carlson's Polycentropus caddisflies range across Alabama, North Carolina, and South Carolina (NatureServe 2003). Within Alabama, they are found in the middle Coosa River basin (NatureServe 2003). Currently, the species is recorded in the middle Choccolocco watershed (Harris et al. 1991) and potentially inhabits two other watersheds associated with the Talladega National Forest (Table C.60). Carlson's Polycentropus caddisflies may occur on several other National Forest management units within the southeast. The National Forests represent approximately 40 percent of the species' range within the State of Alabama. Carlson's Polycentropus caddisflies are generally patchy in their distribution and sparse in their abundance.

Table C.60. Conditions of watersheds potentially supporting Carlson's Polycentropus caddisflies in or within five miles of the National Forests in Alabama.

Forest	HUC code	Watershed	Watershed Conditions	Viability

			% FS	% ag	%urban	Road Density	g[1]	Status[2]	Rank[3]	Risk[4]
Talladega	3150106240	U. Choccolocco	71	11	1	H	E	P		
	3150106250	M. Choccolocco	23	21	13	H	BA	S		**T**
	3150106260	Cheaha	36	19	3	H	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Carlson's Polycentropus caddisflies are benthic dwellers in very small streams (Harris et al. 1991, NatureServe 2003). Most caddisfly species require clean oxygenated water and are intolerant of disturbance, pollution, insecticides, and eutrophication (Harris et al. 1991). Caddisflies complete a one-year life cycle including one or two months as terrestrial adults; during this period they rely on riparian vegetation for food and shelter and may also require nearby (i.e. riparian) rocky crevices or woody debris for daytime cover (Harris et al. 1991). Consequently, *Polycentropus carlsoni* may be sensitive to siltation, point source pollution, increased temperatures, altered flows, and loss or modification of riparian vegetation. According to the recent assessment of National Forest watersheds (Leftwich 2003), two out of three potential watersheds show no indication of potential impairment (Table C.60). The middle Choccolocco watershed may be impaired for water temperature. Watershed condition ratings (Clingenpeel 2003) are "below average" in one of the watersheds in which the species occurs (Middle Choccolocco). This rating is primarily due to fine sediments eroding from upstream and downstream private agricultural, timber, and residential lands; Forest Plan implementation is not expected to alter these conditions. The other watersheds where the species potentially occurs have a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Carlson's Polycentropus caddisflies include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Although watershed conditions are below average in one watershed, Forest Service activities will not contribute to further degradation, and may at least locally improve conditions. Also, as shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats important to this species. Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high"regardless of the selected alternative. Species viability risks will remain constant, primarily due to the rarity of the supporting habitats and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Forest Service restoration activities may also be able to influence and contribute to improved conditions within portions of the middle Choccolocco watershed. Moreover, the upper Choccolocco drainage is an important watershed for several aquatic T&E species and consequently, protection and restoration of habitat would likely be identified as a high priority when a conservation strategy is developed according to revised Forest Plan objectives. Regardless of Forest Service actions, off-Forest silviculture, agriculture, and development will undoubtedly continue to contribute to various forms of habitat degradation, particularly within the middle Choccolocco watershed where elevated temperature has been identified as a high viability concern for this species (USFS 2003b). Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Carlson's Polycentropus caddisfly** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Belle's sanddragon (=variegated clubtail) (*Progomphus bellei*) -- Sensitive

Distribution, Status, and Trend—Globally this dragonfly species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "historical and possibly extirpated" (SH) (NatureServe 2003).

Belle's sanddragons range across Alabama, Florida, and North Carolina (Knopt & Tennessen 1980, NatureServe 2003). Within Alabama they are known from Escambia County (Tennessen 1995). It has been collected in the Sweetwater watershed within the Conecuh National Forest (Krotzer & Krotzer 1994a). It is not known to occur anywhere else within Alabama (Krotzer & Krotzer 1994a). Currently, the species potentially inhabits six watershed associated with the Conecuh National Forest (Table C.61). Belle's sanddragons also occur within at least one other National Forest within the southeast. The National Forests represent an unknown percent of the species' range within the State of Alabama. Belle's sanddragons are disjunct in their distribution and sparse to rare in abundance (Tennessen 1995, Smith et al. 2002).

Table C.61. Conditions of watersheds potentially supporting Belle's sanddragons in or within five miles of the National Forests in Alabama.

Forest	HUC code	Watershed	Watershed Conditions					Viability		
			% FS	% ag	%urban	Road Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140103080	Five Runs	21	34	5	M	E	P		
	3140103090	Yellow-Givens	12	21	1	L	E	P		S
	3140104010	Blackwater	49	13	3	L	E	S		
	3140104100	Sweetwater	12	5	2	L	E	P		S
	3140301050	U. Conecuh	3	23	3	M	E	P		S
	3140304010	L. Conecuh	4	9	3	L	E	P		SF

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Belle's sanddragons primarily inhabit shallow water over sand substrates within spring-fed streams and lakes (Krotzer & Krotzer 1999, NatureServe 2003). In Alabama, they are primarily in spring-fed streams (Tennessen 1995). This species is found in greatest abundance in association with trickling springs and seeps (NatureServe 2003). They are intolerant of pollution, and insecticides (Corbet 1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults (April-May; Krotzer & Krotzer 1999); during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, Belle's sanddragons may be sensitive to siltation, point source pollution, eutrophication, altered flows, elevated temperatures, and loss or modification of aquatic or riparian vegetation (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), the two out of six watersheds show no indication of potential impairment (Table C.61). The other four watersheds may be impaired due to sedimentation or changes in flow. All watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Belle's sanddragons include any actions that could increase siltation, change water flow, release toxic chemicals, modify habitat structure, elevate temperatures, or remove/alter riparian vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats also important to this species. However, there could be short-term impacts to terrestrial habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high" for all action alternatives. Species viability risks will remain constant, primarily due to the rarity of these communities and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Belle's sanddragon** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

<u>A caddisfly (*Rhyacophila carolae*)</u>

Distribution, Status, and Trend—Globally this caddisfly species is ranked as "critically imperiled" (G1); within Alabama, the species is ranked as "critically imperiled" (S1) (NatureServe 2003).

Rhyacophila carolae are endemic to the Sipsey River basin in Alabama, and thus are not likely to occur on any of the National Forests in Alabama (NatureServe 2003).

Treetop emerald dragonfly (*Somatochlora provocans*)

Distribution, Status, and Trend—Globally this dragonfly species is ranked as "vulnerable" (G3); within Alabama, the species is ranked as "vulnerable" (S3S4) (NatureServe 2003).

Treetop emerald dragonflies range across the eastern and southeastern United States (Dunkle 2000). Within Alabama they are known from Bibb, Chilton, Covington, Dale, Escambia, Fayette, Lamar, Marengo, Monroe, and Tuscaloosa Counties (Tennessen 1995). They have been collected on the Conecuh and Talladega (Oakmulgee Division) National Forests (Krotzer & Krotzer 1994a, Krotzer & Krotzer 1994b). Currently, the species potentially inhabits 11 watersheds associated with the Conecuh National Forest and the Oakmulgee Division of the Talladega National Forest (Table C.62). Treetop emerald dragonflies may occur on several other National Forest management units elsewhere in the United States. The National Forests represent an unknown percent of the species' range within the State of Alabama. Treetop emerald dragonflies are generally uncommon in their abundance (Tennessen 1995).

Table C.62. Conditions of watersheds potentially supporting treetop emerald dragonflies in or within five miles of the National Forests in Alabama.

Forest		Watershed	Watershed Conditions					Viability		
			% FS	ag	%urban	Road Density	Rating[1]	Status	Rank[3]	Risk[4]
Conecuh	3140103050	U. Yellow	2	44	4	M	A	U		S
	3140103070	Yellow-Watkins	14	21	1	M	E	P		S
	3140103080	Five Runs	21	34	5	M	E	P		
	3140103090	Yellow-Givens	12	21	1	L	E	P		S
	3140104010	Blackwater	49	13	3	L	E	P		
	3140104100	Sweetwater	12	5	2	L	E	P		S
	3140301050	U. Conecuh	3	23	3	M	E	P		S
	3140304010	L. Conecuh	4	9	3	L	E	P		SF
Oakmulgee	3150202120	Affonee	24	10	1	M	E	U		
	3150202130	Gully	24	7	1	M	E	P		
	3160113030	Big Sandy	30	5	<1	M	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Treetop emerald dragonflies primarily inhabit trickling flow over sphagnum moss within seeps and bogs (Krotzer & Krotzer 1994a, Dunkle 2000). The adults are found in highest abundance in association with forest openings and roadways (Krotzer & Krotzer 1994a). They are intolerant of pollution, and insecticides (Corbet

1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults (April-May; Krotzer & Krotzer 1999); during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, treetop emerald dragonflies may be sensitive to point source pollution, increased pH, altered flows, and loss or modification of aquatic or riparian vegetation and forest openings. According to the recent assessment of National Forest watersheds (Leftwich 2003), six out of 11 possible watersheds show no indication of potential impairment (Table C.62). The other five watersheds exhibit indicators of potential impairment for sediment and water flow with limited opportunities for National Forest management to improve conditions. Conditions have been characterized as "average" in one watershed. The other watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence treetop emerald dragonflies include any actions that could change water flow, release toxic chemicals, adjust water chemistry or nutrient cycling, modify habitat structure, or alter riparian vegetation and forest openings. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation is not likely to adversely affect this species. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the riparian habitats also important to this species. However, there could be short-term impacts to terrestrial habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high" for all action alternatives. Species viability risks will remain constant, primarily due to the rarity of these communities and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the treetop emerald dragonfly** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Laura's clubtail (*Stylurus laurae*)

Distribution, Status, and Trend—Globally this dragonfly species is ranked as "vulnerable" (G3G4); within Alabama, the species is ranked as "historical and possibly extirpated" (SH) (NatureServe 2003).

Laura's clubtails range across eastern North America (NatureServe 2003). Within Alabama they are known from Bibb, Dale, Escambia, Monroe, and Tuscaloosa Counties (Tennessen 1995). They have been collected on the Oakmulgee District of the Talladega National Forest (Krotzer & Krotzer 1996, Krotzer & Krotzer 1999). Currently, the species potentially inhabits four watersheds associated with the Conecuh National Forest and the Oakmulgee Division of the Talladega National Forest (Table C.63). Laura's clubtails may occur on several other National Forest management units elsewhere in the United States. The National Forests represent an unknown percent of the species' range within the State of Alabama. Laura's clubtails are generally disjunct in their distribution. Where encountered, they are generally locally common.

Table C.63. Conditions of watersheds potentially supporting Laura's clubtails in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Density	Rating[1]	Status[2]	Rank[3]	Risk[4]
Conecuh	3140304010	L. Conecuh	4	9	3	L	E	P		SF
Oakmulgee	3150202120	Affonee	24	10	1	M	E	L		
	3150202130	Gully	24	7	1	M	E	P		
	3160113030	Big Sandy	30	5	<1	M	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Laura's clubtails primarily inhabit sand-mud substrates within small wooded streams (NatureServe 2003). This species appears to require high water quality (Krotzer & Krotzer 1996). They are intolerant of pollution, and insecticides (Corbet 1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults (August; Krotzer & Krotzer 1999); during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, Laura's clubtails may be sensitive to turbidity, point source pollution, eutrophication, channelization, altered flows, and loss or modification of aquatic or riparian overstory vegetation (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), three out of four possible watersheds show no indication of potential impairment (Table C.63). The other watershed (Lower Conecuh) exhibits indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. All of the watersheds where the species potentially occurs have a condition rating of "excellent" (Clingenpeel 2003), a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Laura's clubtails include any actions that could increase turbidity, change water flow, release toxic chemicals, channelize, eutrophy, or reduce riparian over-story vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the habitats also important to this species. Furthermore, Forest Plan direction includes objectives for maintaining or restoring early successional riparian habitat. However, there could be short-term impacts to terrestrial habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high" for all action alternatives. Species viability risks will remain constant, primarily due to the rarity of these communities and the continued elevated risks to off-Forest habitats.

Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in “excellent” condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Laura’s clubtail** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

Townes’ (bronze) clubtail (*Stylurus townesi*) -- Sensitive

Distribution, Status, and Trend—Globally this dragonfly species is ranked as “vulnerable” (G3); within Alabama, the species is ranked as “critically imperiled” (S1S2) (NatureServe 2003).

Townes’ clubtails range across the southeastern United States (NatureServe 2003). Within Alabama they are known from Escambia and Mobile Counties (Tennessen 1995). They have been collected on the Conecuh National Forest (Krotzer & Krotzer 1999), and nearby in the Blackwater and Escambia River basins (Tennessen 1979, Krotzer & Krotzer 1994a). Currently, the species potentially inhabits two watersheds associated with the Conecuh National Forest (Table C.64). Townes’ clubtails may occur on several other National Forest management units within the southeast. The National Forests represent an unknown percent of the species’ range within the State of Alabama. Townes’ clubtails are generally rare in their abundance (Tennessen 1995).

Table C.64. Conditions of watersheds potentially supporting Townes’ clubtails in or within five miles of the National Forests in Alabama.

			Watershed Conditions					Viability		
Forest	HUC code	Watershed	% FS	% ag	%urban	Road Density	Rating[1]	Status	Rank	Risk[4]
Conecuh	3140304010	L. Conecuh	4	9	3	L	E	P		SF

	3140104010	Blackwater	49	13	3	L	E	P		

[1] Based on sediment load relative to other NF watersheds: E= excellent, A= average, BA= below average
[2] H= historical, P= potential, A= abundant, C= common, L= locally rare, U= uncommon, R= rare, S= sparse, N= near
[3] Terrestrial Rank: F1= critically imperiled (very high risk), F2= imperiled (high risk), F3= vulnerable (moderate risk)
[4] Sources of potential impairment and moderate-high risk: S= sediment, P= point-source pollution, T= thermal, F = flow

Habitat Relationships and Limiting Factors—Townes' clubtails primarily inhabit clean and clear moderate currents over sand substrates of medium sized streams (Tennessen 1995, NatureServe 2003). This species is found in greatest abundance in association with forested banks (NatureServe 2003). They are intolerant of pollution, and insecticides (Corbet 1999). Most dragonfly species require ample aquatic and emergent vegetation during their aquatic phase (Dunkle 2000). Dragonflies generally complete a multi-year life cycle including variable periods as terrestrial flying adults (July; Krotzer & Krotzer 1999); during this period they may forage away from aquatic habitats within forested floodplains, forest edges, or upland ridges (Corbet 1999). Some species also require a patchwork of open and forested areas, favoring forest edges and sunny patches over streams (Dunkle 1989). Population viability may be dependant on connective corridors of quality riparian and terrestrial habitats (Dunkle 2000). Consequently, Townes' clubtail may be sensitive to siltation, turbidity, point source pollution, altered flows, and loss of riparian vegetation (NatureServe 2003). According to the recent assessment of National Forest watersheds (Leftwich 2003), the one watershed (Lower Conecuh) exhibits indicators of potential impairment for sediment and water flow, with limited opportunities for National Forest management to improve conditions. The one watershed where the species potentially occurs has a condition rating of "excellent", a condition that will most likely continue under the proposed Forest Plan direction.

Potential Management Effects— Potential Forest Service management activities that could influence Townes' clubtails include any actions that could increase siltation or turbidity, change water flow, release toxic chemicals, modify habitat structure, or remove or alter streamside vegetation. As discussed in the general effects section, such effects are unlikely given the protection measures that will be applied under the revised Forest Plan. There could potentially be short-term and localized elevations in sediment run-off due to such Forest health activities as cutting or burning; however, application of Forest Plan standards would minimize the extent and magnitude of effects and full consideration of watershed restoration and species conservation priorities within project planning would further minimize the likelihood of multiple concurrent actions causing significant cumulative adverse effects. Existing average and excellent watershed conditions would be expected to continue or improve. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

As shown in the EIS, the strengthened riparian (prescription 12) and rare community (prescription 9F) standards would provide additional protection for the late successional riparian habitats also important to this species. However, there could be short-term impacts to terrestrial habitats as they adjust to restoration activities. In the long-term, restoration efforts may lead to increased structural and biological diversity and other ecological benefits to these communities (EIS, Chapter 2, USFS 2003c). Although not specifically included in the terrestrial viability assessment, based on the results for similar habitat and species (Appendix F of the EIS, USFS 2003d), the viability risks for this species will likely remain "moderately high" for all action alternatives. Species viability risks will remain constant, primarily due to the rarity of these communities and the continued elevated risks to off-Forest habitats. Therefore, Plan implementation may affect individuals, but effects are not likely to be of a magnitude or duration to adversely affect the viability of the species.

Likewise, Forest-wide standards and prescribed levels of activities would result in progress towards watershed and riparian corridor restoration. Restoration of riparian corridors will generally lead to greater sediment and nutrient run-off buffering, reduced siltation, improved habitat stability and complexity, decreasing water temperatures, and greater availability of large woody debris. In all watersheds, implementation of the riparian prescription and streamside management zone standards is expected to improve conditions at local sites where this species occurs. Although the watersheds thought to harbor this species are rated as in "excellent" condition, additional improvements may be possible with full implementation of the Forest Plan direction. Cumulatively, many of the habitats on private lands are currently in a degraded state, making presence of quality habitats on National Forest land increasingly important to this species.

Determination and Rationale—Overall, implementation of the Plan **may impact individuals, but is likely to be beneficial and is not likely to cause a trend towards federal listing or loss of viability for the Townes' clubtail** because 1) Forest Plan standards will provide protective measures which will avoid or minimize and fully mitigate negative effects so that they are insignificant and discountable to the viability of the populations and the species, and 2) Forest Plan direction encourages actions that will restore watersheds and habitat, and improve water quality, resulting in conservation of the species.

VIII. CONSOLIDATED LIST OF SENSITIVE SPECIES WITH DETERMINATIONS

Table VIII.1. Determinations for National Forests in Alabama Terrestrial Animals.

Scientific Name	Common Name	Determination of Effects
Corynorhinus rafinesquii	Rafinesque's big-eared bat	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Myotis austroriparius	Southeastern myotis	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Myotis leibii	Eastern small-footed bat	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Ursus americanus floridanus	Florida black bear	**beneficial impacts**
Aimophila aestivalis	Bachman's sparrow	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Falco peregrinus	Peregrine Falcon	**beneficial impacts**

Rana capito	Gopher frog	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Gopherus polyphemus	Gopher tortoise	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Pituophis melanoleucus mugitus	Florida pine snake	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Ophisaurus mimicus	Mimic glass lizard	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Speyeria diana	Diana fritillary	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Callophrys irus	Frosted elfin	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**

Table VIII.2. Determinations for National Forests in Alabama Sensitive Plants.

Scientific Name	Common Name	Determination of Effects
Aneura maxima (= A. sharpii)	A liverwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Cheilolejeunea evansii	A liverwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Nardia lescurii	A liverwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Pellia X appalachiana	A liverwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Plagiochila echinata	A liverwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Radula sullivantii	A liverwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Riccardia jugata	A liverwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Tetrodontium brownianum	Little Georgia moss	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Aesculus parviflora	Small-flowered buckeye	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Agalinis divaricata	Pinelands false foxglove	**may impact individuals but not likely to**

Scientific Name	Common Name	Determination of Effects
		cause a trend toward listing or a loss of viability
Agrimonia incisa	Incised agrimony	**no impact**
Andropogon arctatus	Pinewoods bluestem	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Arabis georgiana	Georgia rockcress	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Arnoglossum sulcatum	Indian plantain	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Asplenium X ebenoides	Scott's spleenwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Aster eryngiifolius	Thistleleaf aster	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Aster georgianus	Georgia aster	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Astragalus michauxii	Sandhills milkvetch	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Astragalus tennesseensis	Tennessee milkvetch	**no impact**
Aureolaria patula	Spreading yellow false foxglove	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Baptisia megacarpa	Appalachian wild indigo	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Botrichium jenmenii	Alabama grapefern	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Calopogon multiflorus	Many-flower grass pink	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Calopogon pallidus	Pale grasspink	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Carex brysonii	Bryson's sedge	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Carex decomposita	Cypress-knee sedge	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Carex impressinervia	Ravine sedge	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Castilleja sp. nov. "kraliana"	Kral's Indian paintbrush	**no impact**

Scientific Name	Common Name	Determination of Effects
Coelorachis tuberculosa	Florida jointtail grass	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Colinsonia verticillata	Whorled horsebalm	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Croton alabamensis	Alabama croton	**no impact**
Cypripedium kentuckiense	Southern Lady's slipper	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Delphinium alabamicum	Alabama larkspur	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Diervilla rivularis	Riverbank bush-honeysuckle	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Echinodorus parvulus	Mudbabies	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Fothergilla major	Large witchalder	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Helianthus longifolius	Longleaf sunflower	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Helianthus smithii	Smith sunflower	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hexastylis shuttlesworthii var. *harperi*	Harper's wild ginger	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hexastylis speciosa	Harper's heartleaf	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hymenocallis caroliniana (=H. coronaria)	Carolina spider lily	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hymenophyllum tayloriae	Taylor's filmy fern	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Jamesianthus alabamensis	Alabama jamesianthus	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Juglans cinerea	Butternut	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Lachnocaulon digynum	Pineland bogbutton	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Leavenworthia alabamica var.	Alabama gladecress	**may impact individuals but not likely to**

Scientific Name	Common Name	Determination of Effects
alabamica		**cause a trend toward listing or a loss of viability**
Leavenworthia crassa	Fleshyfruit gladecress	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Lesquerella densipila	Duck River bladderpod	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Lilium iridollae	Panhandle lily	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Lindera subcoriacea	Bog spicebush	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Linum macrocarpum	Spring Hill flax	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Lysimachia fraseri	Fraser's yellow loosestrife	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Macranthera flammea	Flame flower	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Marshallia trinervia	Broadleaf Barbara's buttons	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Minuartia alabamensis	Alabama Sandwort	**no impact**
Monotropsis odorata	Sweet Pinesap	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Myriophyllum laxum	Loose watermilfoil	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Neviusia alabamensis	Alabama snow-wreath	**no impact**
Panicum nudicaule	Naked-stemmed panic grass	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Pieris phillyreifolia	Climbing fetterbush	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Pinguicula planifolia	Chapman's butterwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Pinguicula primuliflora	Southern butterwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Pityopsis oligantha	Coastal-Plain golden-aster	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Plantago sparsiflora	Pineland plantain	**may impact individuals but not likely to**

Scientific Name	Common Name	Determination of Effects
		cause a trend toward listing or a loss of viability
Platanthera integra	Yellow fringeless orchid	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Platanthera integrilabia	White fringeless orchid	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Polygala hookeri	Hooker's milkwort	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Polymnia laevigata	Tennessee leafcup	**no impact**
Quercus arkansana	Arkansas oak	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rhexia salicifolia	Panhandle meadowbeauty	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rhododendron austrinum	Orange azalea	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rhynchospora crinipes	Hairy peduncled beakrush	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rhynchospora macra	Large beakrush	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rhynchospora pleiantha	Coastal beaksedge	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rhynchospora thornei	Thorne's beaksedge	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Robinia viscosa	Clammy locust	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rudbeckia auriculata	Eared coneflower	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rudbeckia heliopsidis	Sunfacing coneflower	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rudbeckia triloba var pinnatiloba	Pinnate-lobed black-eyed Susan	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Ruellia noctiflora	Night flowering ruellia	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Sabatia capitata	Appalachian rose gentian	**may impact individuals but not likely to cause a trend toward listing or a loss of**

Scientific Name	Common Name	Determination of Effects
		viability
Sarracenia leucophylla	Crimson pitcherplant	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Sarracenia rubra ssp. *wherryi*	Wherry's pitcherplant	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Schisandra glabra	Bay starvine	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Scutellaria alabamensis	Alabama skullcap	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Sedum nevii	Nevius' stonecrop	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Silene ovata	Blue Ridge catchfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Silene regia	Royal catchfly	**no impact**
Sporobolus curtisii	Pineland Dropseed	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Sporobolus floridanus	Florida dropseed	**no impact**
Talinum calcaricum	Limestone fameflower	**no impact**
Talinum mengesii	Menge's fameflower	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Tephrosia mohrii	Pineland hoarypea	**no impact**
Thalictrum macrostylum (=T.subrotundum)	Piedmont meadowrue	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Thalictrum mirabile	Little Mountain meadowrue	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Thaspium pinnatifidum	Cutleaved meadow parsnip	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Tofieldia glabra	Smooth tofieldia	**no impact**
Tridens carolinianus	Carolina fluffgrass	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Trillium lancifolium	Lanceleaf trillium	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Trillium rugelii	Southern nodding trillium	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Trillium simile	Jeweled trillium	**may impact individuals but not likely to**

Scientific Name	Common Name	Determination of Effects
		cause a trend toward listing or a loss of viability
Xyris chapmanii	Chapman's yellow-eyed grass	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Xyris drummondii	Drummond's yelloweyed grass	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Xyris isoetifolia	Quillwort yelloweyed grass	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Xyris longisepala	Kral's yelloweyed grass	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Xyris louisianica	Louisiana yelloweyed grass	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Xyris scabrifolia	Harper's yelloweyed grass	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**

Table VIII.3. Determinations for National Forests in Alabama Aquatic Animals.

Scientific Name	Common Name	Effects
Necturus alabamensis	Black Warrior waterdog	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Graptemys ernsti	Escambia map turtle	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Stenotherus minor	Loggerhead musk turtle	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Alosa alabamae	Alabama shad	**beneficial impacts**
Crystallaria asperella	Crystal darter	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Etheostoma sp. Cf. bellator	Sipsey Warrior darter	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Etheostoma bifascia	Florida sand darter	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Etheostoma brevirostrum	Holiday darter	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Etheostoma davisoni	Choctawhatchee darter	**beneficial impacts**
Etheostoma ditrema	Coldwater darter	**may impact individuals but not likely to**

Scientific Name	Common Name	Determination of Effects
		cause a trend toward listing or a loss of viability
Etheostoma douglasi	Tuskaloosa darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Etheostoma parvapinne	Goldstripe darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Etheostoma phytophyllum	Rush darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Etheostoma ramseyi	Alabama darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Etheostoma tuscumbia	Tuscumbia darter	no impacts
Etheostoma zonifer	Backwater darter	beneficial impacts
Hybopsis lineapunctata	Lined chub	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Notropis uranoscopus	Skygazer shiner	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Noturus munitus	Frecklebelly madtom	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Percina austroperca	Southern logperch	beneficial impacts
Percina brevicauda	Coal darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Percina lenticula	Freckled darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Percina macrocephala	Longhead darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Percina palmaris	Bronze darter	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Cambarus englishi	A Crayfish	beneficial impacts
Cambarus miltus	Rusty gravedigger crayfish	beneficial impacts
Procambarus marthae	A crayfish	beneficial impacts
Anodontoides radiatus	Rayed creekshell	may impact individuals but not likely to cause a trend toward listing or a loss of viability
Elliptio arca	Alabama spike	beneficial impacts
Fusconaia succissa	Purple pigtoe	beneficial impacts
Lampsilis australis	Southern sandshell	may impact individuals but not likely to cause a trend toward listing or a loss of

Scientific Name	Common Name	Determination of Effects
		viability
Lasmigona complanta alabamensis	Alabama heelsplitter	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Lasmigona holstonia	Tennessee heelsplitter	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Margaritifera marrianae	Alabama pearlshell	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Obovaria jacksoniana	Southern hickorynut	**no impact**
Obovaria unicolor	Alabama hickorynut	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Pleurobema hanleyianum	Georgia pigtoe	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Pleurobema troshelianum	Alabama clubshell	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Ptychobranchus jonesi	Southern kidneyshell	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Quadrula rumphiana	Ridged mapleleaf	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Strophitus connasaugaensis	Alabama creekmussel	**beneficial impacts**
Strophitus subvexus	Southern creekmussel	**beneficial impacts**
Villosa choctawensis	Choctaw bean	**beneficial impacts**
Villosa nebulosa	Alabama rainbow	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Villosa vanuxemensis umbrans	Coosa combshell (=creekshell)	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Cheumatopsyche bibbensis	A caddisfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Cheumatopsyche helma	Helma’s net-spinning caddisfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Cordulegaster sayi	Say’s spiketail	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Epitheca spinosa	Robust baskettail	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Gomphus geminatus	Twin-striped clubtail	**may impact individuals but not likely to cause a trend toward listing or a loss of**

Scientific Name	Common Name	Determination of Effects
		viability
Gomphus hodgesi	Hodges' clubtail	**beneficial impacts**
Gomphus hybridus	Cocoa clubtail	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hydropsyche hageni	A caddisfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hydroptila cheaha	A caddsfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hydroptila choccolocco	A caddisfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hydroptila paralatosa	A caddisfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hydroptila patriciae	A caddisfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Hydroptila setigera	A caddisfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Neurocordulia molesta	Smokey showdragon	**beneficial impacts**
Oecetis morsei	Morse's Long-horn Sedge	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Ophiogomphus alleghaniensis	Alleghany snaketail	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Ophiogomphus incurvatus	Appalachian snaketail	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Polycentropus carlsoni	Carlson's Polycentropus caddisfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Progomphus bellei	Belle's sanddragon	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Rhyacophila carolae	A caddisfly	**no impact**
Somatochlora provocans	Treetop emerald dragonfly	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Stylurus laurae	Laura's clubtail	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**
Stylurus townesi	Townes' (bronze) clubtail	**may impact individuals but not likely to cause a trend toward listing or a loss of viability**

/s/ Sara Lee Chubb
Sara Lee Chubb
Forest Fisheries Biologist

10/28/2003
Date

/s/ Rhonda S. Stewart
Rhonda S. Stewart
Forest Botanist/Ecologist

10/28/2003
Date

/s/ Dagmar Thurmond
Dagmar Thurmond
Forest Wildlife Biologist

10/28/2003
Date

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ATTACHMENT A1: Bankhead Sensitive Terrestrial Animal Species, Their Habitats, and Expected Outcomes Under Alternative I

Common Name	Habitat Element	Likelihood of Limitation 1	Management Effect[2]	Viability Risk[3]
Rafinesque's big-eared bat	Caves and Mines	H	1	0
	Den Trees	L	2	0
	Lakeshores	M	1	0
	Late Successional Riparian	L	3	0
	Open Wetlands	H	1	0
Diana fritillary	Mature Mesic Hardwood Forests	L	2	0
	Canopy Gaps	L	2	0

Divergent melanoplus	Mature Oak Forests	L	3	0
	Glades and Barrens	M	1	0
Frosted elfin	Early Successional Forests	L	2	0
	Woodlands, Savannas, and Grasslands	M	2	0
Northern bush katydid	Mature Oak Forests	L	3	0
	Mature Mesic Hardwood Forests	L	2	0
Rock-loving grasshopper	Glades and Barrens	M	1	2
	Rock Outcrops and Cliffs	M	1	2
Serrulate melanoplus	Woodlands, Savannas, and Grasslands	M	2	0

[1]Likelihood of Limitation – General likelihood that the habitat element will be limiting to viability of associated species based on its expected abundance and distribution after 50 years of plan implementation. Please see EIS text for a detailed description of the process used to determine likelihood of limitation. L = Low, M = Moderate, H = High.

[2]Management Effect – Values used to categorize the role of management effects on each habitat element for each forest plan revision alternative.
1 = Abundance and distribution of the habitat element is maintained or improved by providing optimal protection, maintenance, and restoration to all occurrences (with limited exceptions in some cases). Little additional opportunity exists to decrease risk to viability of associated species because management is at or near optimal.
2 = Abundance and distribution of the habitat element is improved through purposeful restoration, either through active management or passively by providing for successional progression. Opportunity for decreasing risk to associated species is primarily through increasing rates of restoration, where possible.
3 = The habitat element is maintained at approximately current distribution and abundance, though location of elements may shift over time as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to increase abundance and distribution of the habitat element.
4 = Regardless of management efforts, the habitat element is expected to decrease in distribution and abundance as a result of factors substantially outside of Forest Service control (e.g., invasive pests, acid deposition). Opportunity to reduce risk to viability of associated species is primarily through cooperative ventures with other agencies and organizations.
5 = The habitat element is expected to decrease in distribution and abundance as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to maintain or increase this habitat element.

[3]Viability Risk—The relative risk to viability of the species as a result of its relationship with a particular habitat element. Risk rating is a combination of species rarity and a habitat's likelihood of limitation. Please see EIS text for detailed description of the process used to define viability risk. 0 = Not rated because no populations are known to occur, 1 = Very High Risk, 2 = High Risk, 3 = Moderately High Risk, 4 = Moderate Risk, 5 = Low risk.

ATTACHMENT A2: Conecuh Sensitive Terrestrial Animal Species, Their Habitats, and Expected Outcomes Under Alternative I

Common Name	Habitat Element	Likelihood of Limitation 1	Management Effect2	Viabilit y Risk3
Florida black bear	Canebrakes	H	2	0
	Mature Mesic Hardwood Forests	M	2	0
	Remoteness	H	3	0
	Hard Mast	L	3	0
	Den Trees	L	2	0
Rafinesque's big-eared bat	Den Trees	L	2	0
	Lakeshores	M	1	0
	Late Successional Riparian	L	3	0
	Open Wetlands	M	1	0
Southeastern bat	Den Trees	L	2	3
	Lakeshores	M	1	2
	Late Successional Riparian	L	3	3
	Open Wetlands	M	1	2
Bachman's sparrow	Longleaf Pine Forests	L	2	4
	Woodlands, Savannas, and Grasslands	M	2	3
Gopher frog	Coastal Plain Ponds and Swamps	H	1	1
	Woodlands, Savannas, and Grasslands	M	2	2
Gopher tortoise	Canopy Gaps	L	2	3
	Woodlands, Savannas, and Grasslands	M	2	2
Florida pine snake	Remoteness	H	3	3
	Longleaf Pine Forests	L	2	5
	Downed Wood	L	2	5
Mimic glass lizard	Longleaf Pine Forests	L	2	5

[1]Likelihood of Limitation – General likelihood that the habitat element will be limiting to viability of associated species based on its expected abundance and distribution after 50 years of plan implementation. Please see EIS text for a detailed description of the process used to determine likelihood of limitation. L = Low, M = Moderate, H = High.

[2]Management Effect – Values used to categorize the role of management effects on each habitat element for each forest plan revision alternative.
1 = Abundance and distribution of the habitat element is maintained or improved by providing optimal protection, maintenance, and restoration to all occurrences (with limited exceptions in some cases). Little additional opportunity exists to decrease risk to viability of associated species because management is at or near optimal.
2 = Abundance and distribution of the habitat element is improved through purposeful restoration, either through active management or passively by providing for successional progression. Opportunity for decreasing risk to associated species is primarily through increasing rates of restoration, where possible.
3 = The habitat element is maintained at approximately current distribution and abundance, though location of elements may shift over time as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to increase abundance and distribution of the habitat element.
4 = Regardless of management efforts, the habitat element is expected to decrease in distribution and abundance as a result of factors substantially outside of Forest Service control (e.g., invasive pests, acid deposition). Opportunity to reduce risk to viability of associated species is primarily through cooperative ventures with other agencies and organizations.
5 = The habitat element is expected to decrease in distribution and abundance as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to maintain or increase this habitat element.

[3]Viability Risk—The relative risk to viability of the species as a result of its relationship with a particular habitat element. Risk rating is a combination of species rarity and a habitat's likelihood of limitation. Please see EIS text for detailed description of the process used to define viability risk. 0 = Not rated because no populations are known to occur, 1 = Very High Risk, 2 = High Risk, 3 = Moderately High Risk, 4 = Moderate Risk, 5 = Low risk.

ATTACHMENT A3: Oakmulgee Sensitive Terrestrial Animal Species, Their Habitats, and Expected Outcomes Under Alternative I

Common Name	Habitat Element	Likelihood of Limitation 1	Management Effect2	Viabilit y Risk3
Rafinesque's big-eared bat	Open Wetlands	M	2	0
	Den Trees	L	2	0
	Lakeshores	M	1	0
	Late Successional Riparian	L	3	0
Southeastern bat	Open Wetlands	M	2	0
	Den Trees	L	2	0
	Lakeshores	M	1	0
	Late Successional Riparian	L	3	0
Bachman's sparrow	Woodlands, Savannas, and Grasslands	M	2	0
	Longleaf Pine Forests	L	2	0

[1]Likelihood of Limitation – General likelihood that the habitat element will be limiting to viability of associated species based on its expected abundance and distribution after 50 years of plan implementation. Please see EIS text for a detailed description of the process used to determine likelihood of limitation. L = Low, M = Moderate, H = High.

[2]Management Effect – Values used to categorize the role of management effects on each habitat element for each forest plan revision alternative.
1 = Abundance and distribution of the habitat element is maintained or improved by providing optimal protection, maintenance, and restoration to all occurrences (with limited exceptions in some cases). Little additional opportunity exists to decrease risk to viability of associated species because management is at or near optimal.
2 = Abundance and distribution of the habitat element is improved through purposeful restoration, either through active management or passively by providing for successional progression. Opportunity for decreasing risk to associated species is primarily through increasing rates of restoration, where possible.
3 = The habitat element is maintained at approximately current distribution and abundance, though location of elements may shift over time as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to increase abundance and distribution of the habitat element.
4 = Regardless of management efforts, the habitat element is expected to decrease in distribution and abundance as a result of factors substantially outside of Forest Service control (e.g., invasive pests, acid deposition). Opportunity to reduce risk to viability of associated species is primarily through cooperative ventures with other agencies and organizations.
5 = The habitat element is expected to decrease in distribution and abundance as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to maintain or increase this habitat element.

[3]Viability Risk—The relative risk to viability of the species as a result of its relationship with a particular habitat element. Risk rating is a combination of species rarity and a habitat's likelihood of limitation. Please see EIS text for detailed description of the process used to define viability risk. 0 = Not rated because no populations are known to occur, 1 = Very High Risk, 2 = High Risk, 3 = Moderately High Risk, 4 = Moderate Risk, 5 = Low risk.

ATTACHMENT A4: Talladega Sensitive Terrestrial Animal Species, Their Habitats, and Expected Outcomes Under Alternative I

Common Name	Habitat Element	Likelihood of Limitation 1	Management Effect2	Viability Risk3
Eastern small-footed bat	Late Successional Riparian	L	3	0
	Caves and Mines	H	1	0
	Rock Outcrops and Cliffs	M	1	0
Rafinesque’s big-eared bat	Caves and Mines	H	1	0
	Den Trees	L	2	0
	Lakeshores	M	1	0
	Late Successional Riparian	L	3	0
	Open Wetlands	H	1	0
Southeastern bat	Den Trees	L	2	0
	Lakeshores	M	1	0
	Late Successional Riparian	L	3	0
	Open Wetlands	H	1	0
Bachman’s sparrow	Woodlands, Savannas, and Grasslands	M	2	2
Peregrine falcon	Rock Outcrops and Cliffs	M	1	2
	Remoteness	H	3	1
Diana fritillary	Mature Mesic Hardwood Forests	L	2	2
	Canopy Gaps	L	2	2
Divergent melanoplus	Mature Oak Forests	L	3	0
	Glades and Barrens	M	1	0
Frosted elfin	Early Successional Forests	L	2	0
	Woodlands, Savannas, and Grasslands	M	2	0
Northern bush katydid	Mature Oak Forests	L	3	0
	Mature Mesic Hardwood Forests	L	2	0
Rock-loving grasshopper	Glades and Barrens	M	1	0
	Rock Outcrops and Cliffs	M	1	0
Serrulate melanoplus	Woodlands, Savannas, and Grasslands	M	2	0

[1]Likelihood of Limitation – General likelihood that the habitat element will be limiting to viability of associated species based on its expected abundance and distribution after 50 years of plan implementation. Please see EIS text for a detailed description of the process used to determine likelihood of limitation. L = Low, M = Moderate, H = High.

[2]Management Effect – Values used to categorize the role of management effects on each habitat element for each forest plan revision alternative.
1 = Abundance and distribution of the habitat element is maintained or improved by providing optimal protection, maintenance, and restoration to all occurrences (with limited exceptions in some cases). Little additional opportunity exists to decrease risk to viability of associated species because management is at or near optimal.
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3 = The habitat element is maintained at approximately current distribution and abundance, though location of elements may shift over time as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to increase abundance and distribution of the habitat element.
4 = Regardless of management efforts, the habitat element is expected to decrease in distribution and abundance as a result of factors substantially outside of Forest Service control (e.g., invasive pests, acid deposition). Opportunity to reduce risk to viability of associated species is primarily through cooperative ventures with other agencies and organizations.
5 = The habitat element is expected to decrease in distribution and abundance as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to maintain or increase this habitat element.

[3]Viability Risk—The relative risk to viability of the species as a result of its relationship with a particular habitat element. Risk rating is a combination of species rarity and a habitat's likelihood of limitation. Please see EIS text for detailed description of the process used to define viability risk. 0 = Not rated because no populations are known to occur, 1 = Very High Risk, 2 = High Risk, 3 = Moderately High Risk, 4 = Moderate Risk, 5 = Low risk.

ATTACHMENT A5: Tuskegee Sensitive Terrestrial Animal Species, Their Habitats, and Expected Outcomes Under Alternative I

Common Name	Habitat Element	Likelihood of Limitation[1]	Management Effect[2]	Viability Risk[3]
Rafinesque's big-eared bat	Den Trees	L	2	0
	Lakeshores	M	1	0
	Late Successional Riparian	L	3	0
	Open Wetlands	H	1	0
Southeastern bat	Den Trees	L	2	0
	Late Successional Riparian	L	3	0
	Open Wetlands	H	1	0
	Lakeshores	M	1	0
Bachman's sparrow	Longleaf Pine Forest	L	2	0
	Woodlands, Savannas, and Grasslands	M	2	0
Florida pine snake	Longleaf Pine Forest	L	2	0
	Downed Wood	L	2	0
	Remoteness	H	3	0

[1]Likelihood of Limitation – General likelihood that the habitat element will be limiting to viability of associated species based on its expected abundance and distribution after 50 years of plan implementation. Please see EIS text for a detailed description of the process used to determine likelihood of limitation. L = Low, M = Moderate, H = High.

[2]Management Effect – Values used to categorize the role of management effects on each habitat element for each forest plan revision alternative.
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4 = Regardless of management efforts, the habitat element is expected to decrease in distribution and abundance as a result of factors substantially outside of Forest Service control (e.g., invasive pests, acid deposition). Opportunity to reduce risk to viability of associated species is primarily through cooperative ventures with other agencies and organizations.
5 = The habitat element is expected to decrease in distribution and abundance as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to maintain or increase this habitat element.

[3]Viability Risk—The relative risk to viability of the species as a result of its relationship with a particular habitat element. Risk rating is a combination of species rarity and a habitat's likelihood of limitation. Please see EIS text for detailed description of the process used to define viability risk. 0 = Not rated because no populations are known to occur, 1 = Very High Risk, 2 = High Risk, 3 = Moderately High Risk, 4 = Moderate Risk, 5 = Low risk.

ATTACHMENT B: Sensitive Plant Species, Their Habitats, and Expected Outcomes Under Alternative I

Common Name	Habitat Element	Likelihood of Limitation 1	Management Effect2	Viability Risk3
Liverwort (*Aneura maxima*)	Rock Outcrops and Cliffs	M	1	2
	Bogs, Fens, Seeps, Ponds	H	1	1
	Spray Cliffs	M	1	2
Liverwort (*Cheilolegiunea evansii*)	Late Successional Riparian	L	3	3
Liverwort (*Nardia lescurii*)	Late Successional Riparian	L	3	3
Liverwort (*Pellia X appalachiana*)	Late Successional Riparian	L	3	3
	Rock Outcrops and Cliffs	M	1	2
Liverwort (*Plagiochila echinata*)	Rock Outcrops and Cliffs	M	1	3
	Late Successional Riparian	L	3	4
Liverwort (*Radula sullivantii*)	Rock Outcrops and Cliffs	M	1	2
	Late Successional Riparian	L	3	3
	Spray Cliffs	M	1	2
Liverwort (*Riccardia jugata*)	Downed Wood	L	2	3
	Late Successional Riparian	L	3	3
Little Georgia Moss	Late Successional Riparian	L	3	3
	Rock Outcrops and Cliffs	M	1	2
	Spray Cliffs	M	1	2
Small-flowered buckeye	Mature Mesic HW Forests	M/L	2	3
Pinelands false foxglove	Longleaf Pine Forests	L	2	3
Incised agrimony	Longleaf Pine Forests	L	2	3
Pinewoods bluestem	Longleaf Pine Forests	L	2	3
	Wet savannas and Flatwoods	M	1	2
Georgia rockcress	Glades and Barrens	M	1	2
Indian plantain	Bogs, Fens, Seeps, Seasonal Ponds	H	1	2
Scott’s spleenwort	Rock Outcrops and Cliffs	M	1	2
Thistleleaf aster	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
	Wet savannas and Flatwoods	M	1	2
Georgia aster	Glades and Barrens	M	1	2
	Woodlands, Savannas, and Grasslands	M	2	2
Sandhills milkvetch	Sandhills	M	1	2
	Longleaf Pine Forests	L	2	2
Tennessee milkvetch	Glades and Barrens	M	1	1
Spreading yellow false foxglove	Mature Oak Forests	M/L	5/3	3
Appalachian wild indigo	Mature Mesic HW Forests	M/L	2	2
	Late Successional Riparian	L	3	2
Alabama grape fern	Canopy Gaps	M/L	2	2
	Woodlands, Savannas, and Grasslands	M	2	2
	Mixed Landscapes	L	3	3
	Mature Oak Forests	M/L	5/3	3
Many-flowered grass pink	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1

Common Name	Habitat Element	Likelihood of Limitation 1	Management Effect[2]	Viability Risk[3]
	Wet savannas and Flatwoods	M	1	2
Pale grasspink	Bogs, Fens, Seeps, Seasonal Ponds	H	1	3
	Wet savannas and Flatwoods	M	1	3
Bryson's sedge	Mature Hemlock Forests	H	4	1
	Late Successional Riparian	L	3	1
Cypress-knee sedge	Coastal Plains Ponds and Swamps	H	1	1
Ravine sedge	Late Successional Riparian	L	3	3
Kral's Indian paintbrush	Woodlands, Savannas, and Grasslands	M	2	1
	Mountain Longleaf Pine Forest	L	2	2
Florida jointtail grass	Coastal Plains Ponds and Swamps	H	1	1
	Wet savannas and Flatwoods	M	1	2
	Open Wetlands	H/M/M	1/2/2	2
Whorled horsebalm	Mature Mesic HW Forests	M/L	2	2
	Basic Mesic Forests	M	1	2
Alabama croton	Glades and Barrens	M	1	2
	Basic Mesic Forests	M	1	2
Southern lady's slipper	Late Successional Riparian	L	3	3
Alabama larkspur	Glades and Barrens	M	1	2
	Cedar Woodlands	M	1	1
Riverbank bush honeysuckle	Late Successional Riparian	L	3	3
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
	Early-Successional Riparian	H	2	1
Mudbabies (Dwarf burhead)	Coastal Plains Ponds and Swamps	H	1	1
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
Large witchalder	Mature Oak Forests	M/L	5/3	3
	Woodlands, Savannas, and Grasslands	M	2	2
Longleaf sunflower	Glades and Barrens	M	1	2
Smith sunflower	Mountain Longleaf Pine Forest	L	2	3
Harper's wild ginger	Bogs, Fens, Seeps, Seasonal Ponds	H	1	2
	Late Successional Riparian	L	3	2
Harper's heartleaf	Baygalls and Bayheads	M	1	2
Carolina spider lily	Early Successional Riparian	H	2	2
	Open Wetlands	H/M/M	1/2/2	2
	River Channels	H	1	1
Taylor's filmy fern	Rock Outcrops and Cliffs	M	1	2
	Spray Cliffs	M	1	2
Alabama warbonnet	Late Successional Riparian	L	3	2
	Canopy Gaps	M/L	2	2
	River Channels	H	1	1
Butternut	Late Successional Riparian	L	3	3
	Basic Mesic Forests	M	1	2
	Mature Mesic HW Forests	M/L	2	2
Pineland bogbutton	Open Wetlands	H/M/M	1/2/2	2
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	2
Alabama gladecress	Glades and Barrens	M	1	1
Fleshyfruit gladecress	Glades and Barrens	M	1	2
Duck river bladderpod	Glades and Barrens	M	1	1
Panhandle lily	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1

Common Name	Habitat Element	Likelihood of Limitation 1	Management Effect2	Viability Risk3
	Coastal Plains Ponds and Swamps	H	1	1
	Wet savannas and Flatwoods	M	1	1
Bog spicebush	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
	Baygalls and Bayheads	M	1	2
Spring hill flax	Wet savannas and Flatwoods	M	1	2
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
Fraser's yellow loosestrife	Canopy Gaps	M/L	2	2
	Mature Mesic HW Forests	M/L	2	2
	Early Successional Riparian	H	2	2
	River Channels	H	1	1
Flame flower	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
	Baygalls and Bayheads	M	1	2
Broadleaf Barbara's buttons	Late Successional Riparian	L	3	3
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	2
	Early Successional Riparian	H	2	2
Alabama sandwort	Glades and Barrens	M	1	2
Sweet pinesap	Woodlands, Savannas, and Grasslands	M	2	2
	Mature Oak Forests	M/L	5/3	2
	Mature Yellow Pine Forests	L	2	2
Loose water milfoil	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
	Coastal Plains Ponds and Swamps	H	1	2
	Lakeshores	M	1	2
Alabama snow-wreath	Canopy Gaps	M/L	2	2
	Basic Mesic Forests	M	1	2
	Late Successional Riparian	L	3	2
Naked-stemmed panic grass	Bogs, Fens, Seeps, Seasonal Ponds	H	1	3
	Wet savannas and Flatwoods	M	1	2
Climbing fetterbush	Wet savannas and Flatwoods	M	1	3
	Coastal Plains Ponds and Swamps	H	1	2
Chapman's butterwort	Bogs, Fens, Seeps, Seasonal Ponds	H	1	2
	Wet savannas and Flatwoods	M	1	2
Southern butterwort	Bogs, Fens, Seeps, Seasonal Ponds	H	1	2
	Baygalls and Bayheads	M	1	3
	Wet savannas and Flatwoods	M	1	2
Coastal-plain golden-aster	Bogs, Fens, Seeps, Seasonal Ponds	H	1	2
Pineland plantain	Mountain Longleaf Pine Forest	L	2	2
Yellow fringeless orchid	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
White fringeless orchid	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
	Baygalls and Bayheads	M	1	1
Hooker's milkwort	Wet savannas and Flatwoods	M	1	2
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
Tennessee leafcup	Mixed Landscapes	L	3	0
	Rock Outcrops and Cliffs	M	1	0
Arkansas oak	Woodlands, Savannas, and Grasslands	M	2	2
	Longleaf Pine Forests	L	2	2
Panhandle meadowbeauty	Wet savannas and Flatwoods	M	1	2
	Coastal Plains Ponds and Swamps	H	1	1
Orange azalea	Wet savannas and Flatwoods	M	1	2

Common Name	Habitat Element	Likelihood of Limitation 1	Management Effect2	Viability Risk3
	Mature Mesic HW Forests	M/L	2	3
Hairy peduncled beakrush	Late Successional Riparian	L	3	3
	Early-Successional Riparian	H	2	1
Large beakrush	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
Coastal beaksedge	Open Wetlands	H/M/M	1/2/2	2
	Wet savannas and Flatwoods	M	1	2
Thorne's beaksedge	Open Wetlands	H/M/M	1/2/2	2
	Wet savannas and Flatwoods	M	1	2
Clammy locust	Rock Outcrops and Cliffs	M	1	2
	Woodlands, Savannas, and Grasslands	M	2	2
	Mountain Longleaf Pine Forest	L	2	2
Eared coneflower	River Channels	H	1	1
	Early-Successional Riparian	H	2	2
Sun-facing coneflower	Woodlands, Savannas, and Grasslands	M	2	2
	Early-Successional Forests	L	2	2
Pinnate-lobed black-eye Susan	Late Successional Riparian	L	3	2
	Mature Mesic HW Forests	M/L	2	2
Night flowering Ruellia	Wet savannas and Flatwoods	M	1	2
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
	Longleaf Pine Forests	L	2	2
Appalachian rose gentian	Woodlands, Savannas, and Grasslands	M	2	2
	Glades and Barrens	M	1	2
	Mountain Longleaf Pine Forest	L	2	2
White-topped pitcherplant	Bogs, Fens, Seeps, Seasonal Ponds	H	1	2
Wherry's pitcherplant	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
Bay starvine	Late Successional Riparian	L	3	2
	Mature Mesic HW Forests	M/L	2	2
Alabama skullcap	Mature Mesic HW Forests	M/L	2	2
	Mature Oak Forests	M/L	5/3	2
Nevius' stonecrop	Rock Outcrops and Cliffs	M	1	2
	Basic Mesic Forests	M	1	2
Blue Ridge catchfly	Mature Mesic HW Forests	M/L	2	2
	Late Successional Riparian	L	3	3
Royal catchfly	Woodlands, Savannas, and Grasslands	M	2	2
	Glades and Barrens	M	1	2
	Mature Oak Forests	M/L	5/3	2
Pineland dropseed	Longleaf Pine Forests	L	2	3
	Wet savannas and Flatwoods	M	1	2
Florida dropseed	Longleaf Pine Forests	L	2	0
	Wet savannas and Flatwoods	M	1	0
Limestone fameflower	Glades and Barrens	M	1	2
Menge's fameflower	Glades and Barrens	M	1	2
Pineland hoarypea	Longleaf Pine Forests	L	2	0
	Sandhills	M	1	0
Piedmont Meadowrue	Mature Mesic HW Forests	M/L	2	2
	Early-Successional Riparian	H	2	2

Common Name	Habitat Element	Likelihood of Limitation 1	Management Effect2	Viability Risk3
Little mountain Meadowrue	Rock Outcrops and Cliffs	M	1	2
Cutleaved meadow parsnip	Woodlands, Savannas, and Grasslands	M	2	2
	Glades and Barrens	M	1	2
Smooth tofieldia	Wet savannas and Flatwoods	M	1	0
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	0
Carolina fluffgrass	Wet savannas and Flatwoods	M	1	2
	Coastal Plains Ponds and Swamps	H	1	1
Lanceleaf trillium	Late Successional Riparian	L	3	3
	Basic Mesic Forests	M	1	2
Southern nodding trillium	Late Successional Riparian	L	3	2
	Basic Mesic Forests	M	1	2
	Mature Mesic HW Forests	M/L	2	2
Jeweled trillium	Late Successional Riparian	L	3	2
	Basic Mesic Forests	M	1	2
Chapman’s yellow-eyed grass	Wet savannas and Flatwoods	M	1	2
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
Drummond’s yellow-eyed grass	Wet savannas and Flatwoods	M	1	3
	Coastal Plains Ponds and Swamps	H	1	2
Quillwort yellow-eyed grass	Wet savannas and Flatwoods	M	1	2
	Coastal Plains Ponds and Swamps	H	1	1
Kral’s yellow-eyed grass	Wet savannas and Flatwoods	M	1	2
	Coastal Plains Ponds and Swamps	H	1	1
Louisiana yellow-eyed grass	Wet savannas and Flatwoods	M	1	2
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1
Harper’s yellow-eyed grass	Wet savannas and Flatwoods	M	1	2
	Coastal Plains Ponds and Swamps	H	1	1
	Bogs, Fens, Seeps, Seasonal Ponds	H	1	1

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ATTACHMENT C – National Forests in Alabama - Regional Forester's Sensitive Species List

Forest	Group	Scientific Name	Common Name	G-Rank
Bank	Amphibian	*Necturus alabamensis*	Black Warrior waterdog	G2
Con	Amphibian	*Rana capito capito*	Carolina gopher frog	G3G4T3
Con, Oak, Talladega NF	Bird	*Aimophila aestivalis*	Bachman's sparrow	G3
Talladega NF	Bird	*Falco peregrinus*	Peregrine falcon	G4
Con	Crustacean	*Cambarus englishi*	A crayfish	G3
Con	Crustacean	*Cambarus hallii*	A crayfish	G3
Con, Oak	Crustacean	*Procambarus marthae*	A crayfish	G3
Oak	Fish	*Alosa alabamae*	Alabama shad	G3
Oak, Tusk	Fish	*Crystallaria asprella*	Crystal darter	G3
Bank	Fish	*Etheostoma bellator*	Warrior darter	G2
Con	Fish	*Etheostoma bifascia*	Florida sand darter	G3
Talladega NF	Fish	*Etheostoma brevirostrum*	Holiday darter	G2
Con	Fish	*Etheostoma davisoni*	Choctawhatchee darter	G3
Talladega NF	Fish	*Etheostoma ditrema*	Coldwater darter	G1G2
Bank	Fish	*Etheostoma douglasi*	Tuskaloosa darter	G2
Oak	Fish	*Etheostoma parvapinne*	Goldstripe darter	G1
Bank	Fish	*Etheostoma phytophyllum*	Rush darter	G1G2
Oak	Fish	*Etheostoma ramseyi*	Alabama darter	G2
Bank	Fish	*Etheostoma tuscumbia*	Tuscumbia darter	G2
Oak	Fish	*Etheostoma zonifer*	Blackwater darter	G3
Oak	Fish	*Notropis uranoscopus*	Skygazer shiner	G2
Oak	Fish	*Noturus munitus*	Frecklebelly madtom	G3
Con	Fish	*Percina austroperca*	Southern logperch	G3
Oak	Fish	*Percina brevicauda*	Coal darter	G2
Oak, Tusk	Fish	*Percina lenticula*	Freckled darter	G2
Talladega NF	Fish	*Percina macrocephala*	Longhead darter	G3
Talladega NF	Fish	*Percina palmaris*	Bronze darter	G3
Oak	Insect	*Cheumatopsyche bibbensis*	A caddisfly	G1
Talladega NF	Insect	*Cheumatopsyche helma*	Helma's net-spinning caddisfly	G1G3
Con	Insect	*Cordulegaster sayi*	Say's spiketail	G1G2

Forest	Group	Scientific Name	Common Name	G-Rank
Con	Insect	*Epitheca spinosa*	Robust baskettail	G3
Con	Insect	*Gomphus geminatus*	Twin-striped clubtail	G3
Con	Insect	*Gomphus hodgesi*	Hodges' clubtail	G3
Oak	Insect	*Gomphus hybridus*	Cocoa clubtail	G3
Oak	Insect	*Hydropsyche hageni*	A caddisfly	G2
Talladega NF	Insect	*Hydroptila cheaha*	A caddisfly	G1
Talladega NF	Insect	*Hydroptila choccolocco*	A caddisfly	G1
Oak	Insect	*Hydroptila paralatosa*	A caddisfly	G2
Talladega NF	Insect	*Hydroptila patriciae*	A caddisfly	G1
Talladega NF	Insect	*Hydroptila setigera*	A caddisfly	G1
Tusk	Insect	*Neurocordulia molesta*	Smoky shadowdragon	G3
Con, Oak	Insect	*Oecetis morsei*	A caddisfly	G2
Talladega NF	Insect	*Ophiogomphus alleghaniensis*	Allegheny Snaketail	G3Q
Talladega NF	Insect	*Polycentropus carlsoni*	Carlson's polycentropus caddisfly	G1G3
Con	Insect	*Progomphus bellei*	Belle's sanddragon	G3
Bank	Insect	*Rhyacophila carolae*	A caddisfly	G1
Con, Oak, Tusk	Insect	*Somatochlora provacans*	Treetop emerald dragonfly	G3
Talladega NF	Insect	*Speyeria diana*	Diana fritillary	G3
Oak	Insect	*Stylurus laurae*	Laura's clubtail	G3
Con	Insect	*Stylurus townesi*	Townes' clubtail	G3
NFAL	Mammal	*Corynorhinus rafinesquii*	Rafinesque's big-eared bat	G3G4
Con, Oak	Mammal	*Myotis austroriparius*	Southeastern myotis	G3G4
Con	Mammal	*Ursus americanus floridanus*	Florida black bear	G5T2
Oak	Mollusk	*Anodontoides radiatus*	Rayed creekshell	G3
Bank, Talladega NF	Mollusk	*Elliptio arca*	Alabama spike	G3
Con	Mollusk	*Fusconaia succissa*	Purple pigtoe	G3
Con	Mollusk	*Lampsilis australis*	Southern sandshell	G2
NFAL	Mollusk	*Lasmigona complanta alabamensis*	Alabama heelsplitter	G5T2
Talladega NF	Mollusk	*Lasmigona holstonia*	Tennessee Heelsplitter	G3
Con (historical)	Mollusk	*Margaritifera marrianae*	Alabama pearlshell	G1
Oak	Mollusk	*Obovaria jacksoniana*	Southern hickorynut	G2G3
Bank	Mollusk	*Obovaria unicolor*	Alabama hickorynut	G3

Forest	Group	Scientific Name	Common Name	G-Rank
Con	Mollusk	*Ptychobranchus jonesi*	Southern kidneyshell	G1
Oak	Mollusk	*Quadrula rumphiana*	Ridged mapleleaf	G3
Talladega NF	Mollusk	*Strophitus connasaugaensis*	Alabama creekmussel	G3
Bank, Talladega NF, Tusk	Mollusk	*Strophitus subvexus*	Southern creekmussel	G2
Con	Mollusk	*Villosa choctawensis*	Choctaw bean	G2
Bank, Talladega NF	Mollusk	*Villosa nebulosa*	Alabama rainbow	G3
Talladega NF	Mollusk	*Villosa vanuxemensis umbrans*	Coosa combshell	G4T2
Con	Reptile	*Gopherus polyphemus*	Gopher tortoise	G3
Con	Reptile	*Graptemys ernsti*	Escambia map turtle	G2
Con	Reptile	*Ophisaurus mimicus*	Mimic glass lizard	G3
Con	Reptile	*Pituophis melanoleucus mugitus*	Florida pine snake	G5T3?
Bank	Nonvasc. Plant	*Aneura maxima (= A. sharpii)*	A liverwort	G1G2
Bank	Nonvasc. Plant	*Cheilolejeunea evansii*	A liverwort	G1
Bank	Nonvasc. Plant	*Nardia lescurii*	A liverwort	G3
Bank	Nonvasc. Plant	*Pellia X appalachiana*	A liverwort	G1?
Bank	Nonvasc. Plant	*Plagiochila echinata*	A liverwort	G2
Bank	Nonvasc. Plant	*Radula sullivantii*	A liverwort	G2
Bank	Nonvasc. Plant	*Riccardia jugata*	A liverwort	G1G2
Talladega NF	Nonvasc. Plant	*Tetrodontium brownianum*	Little Georgia moss	G3
Bank, Talladega, Oak	Vascular Plant	*Aesculus parviflora*	Small-flowered buckeye	G2G3
Con	Vascular Plant	*Agalinis divaricata*	Pinelands false foxglove	G3
Con	Vascular Plant	*Agrimonia incisa*	Incised agrimony	G3
Con	Vascular Plant	*Andropogon arctatus*	Pinewoods bluestem	G3
Oak	Vascular Plant	*Arabis georgiana*	Georgia rockcress	G2
Con	Vascular Plant	*Arnoglossum sulcatum*	Indian plantain	G2G3
Bank	Vascular Plant	*Asplenium X ebenoides*	Scott's spleenwort	HYB
Con	Vascular Plant	*Aster eryngiifolius*	Thistleleaf aster	G3G4
Talladega NF	Vascular Plant	*Aster georgianus*	Georgia aster	G2G3
Con	Vascular Plant	*Astragalus michauxii*	Sandhills milkvetch	G3
Bank	Vascular Plant	*Astragalus tennesseensis*	Tennessee milkvetch	G3
Bank	Vascular Plant	*Aureolaria patula*	Spreading yellow false foxglove	G2G3
Con, Oak, Tusk	Vascular Plant	*Baptisia megacarpa*	Appalachian wild indigo	G2

Forest	Group	Scientific Name	Common Name	G-Rank
Talladega NF	Vascular Plant	*Botrichium jenmenii*	Alabama grapefern	G3G4
Con	Vascular Plant	*Calopogon multiflorus*	Many-flower grass pink	G2G3
Con	Vascular Plant	*Calopogon pallidus*	Pale grasspink	G3
Bank	Vascular Plant	*Carex brysonii*	Bryson's sedge	G1
Oak	Vascular Plant	*Carex decomposita*	Cypress-knee sedge	G3
Oak	Vascular Plant	*Carex impressinervia*	Ravine sedge	G1G2
Oak, Talladega NF	Vascular Plant	*Castilleja* sp. *nov. "kraliana"*	Kral's Indian paintbrush	G2
Con	Vascular Plant	*Coelorachis tuberculosa*	Florida jointtail grass	G3
Talladega NF	Vascular Plant	*Colinsonia verticillata*	Whorled horsebalm	G3
Oak	Vascular Plant	*Croton alabamensis*	Alabama croton	G3
Oak	Vascular Plant	*Cypripedium kentuckiense*	Southern lady's slipper	G3
Bank	Vascular Plant	*Delphinium alabamicum*	Alabama larkspur	G2
Bank	Vascular Plant	*Diervilla rivularis*	Riverbank bush-honeysuckle	G3
Con	Vascular Plant	*Echinodorus parvulus*	Mudbabies	G3
Oak, Talladega NF	Vascular Plant	*Fothergilla major*	Large witchalder	G3
Oak, Talladega NF	Vascular Plant	*Helianthus longifolius*	Longleaf sunflower	G3
Talladega NF	Vascular Plant	*Helianthus smithii*	Smith sunflower	G2Q
Talladega NF	Vascular Plant	*Hexastylis shuttlesworthii* var. *harperi*	Harper's wild ginger	G4T3
Oak	Vascular Plant	*Hexastylis speciosa*	Harper's heartleaf	G2
Oak, Talladega NF	Vascular Plant	*Hymenocallis caroliniana (=H. coronaria)*	Carolina spider lily	G2Q
Bank	Vascular Plant	*Hymenophyllum tayloriae*	Taylor's filmy fern	G1G2
Bank, Oak, Talladega NF	Vascular Plant	*Jamesianthus alabamensis*	Alabama jamesianthus	G3
Bank	Vascular Plant	*Juglans cinerea*	Butternut	G3G4
Con	Vascular Plant	*Lachnocaulon digynum*	Pineland bogbutton	G3
Bank	Vascular Plant	*Leavenworthia alabamica* var. *alabamica*	Alabama gladecress	G2G3T2T3Q
Bank	Vascular Plant	*Leavenworthia crassa*	Fleshyfruit gladecress	G2
Bank	Vascular Plant	*Lesquerella densipila*	Duck River bladderpod	G3
Con	Vascular Plant	*Lilium iridollae*	Panhandle lily	G1G2
Con	Vascular Plant	*Lindera subcoriacea*	Bog spicebush	G2
Con	Vascular Plant	*Linum macrocarpum*	Spring Hill flax	G2?
Talladega NF	Vascular Plant	*Lysimachia fraseri*	Fraser's yellow loosestrife	G2

Forest	Group	Scientific Name	Common Name	G-Rank
Con	Vascular Plant	*Macranthera flammea*	Flame flower	G3
Talladega NF	Vascular Plant	*Marshallia trinervia*	Broadleaf Barbara's buttons	G3
Talladega NF	Vascular Plant	*Minuartia alabamensis*	Alabama Sandwort	G2
Bank	Vascular Plant	*Monotropsis odorata*	Sweet Pinesap	G3
Con	Vascular Plant	*Myriophyllum laxum*	Loose watermilfoil	G3
Bank, Oak, Talladega NF	Vascular Plant	*Neviusia alabamensis*	Alabama snow-wreath	G2
Con	Vascular Plant	*Panicum nudicaule*	Naked-stemmed panic grass	G3?
Con	Vascular Plant	*Pieris phillyreifolia*	Climbing fetterbush	G3
Con	Vascular Plant	*Pinguicula planifolia*	Chapman's butterwort	G3?
Con	Vascular Plant	*Pinguicula primuliflora*	Southern butterwort	G3G4
Con	Vascular Plant	*Pityopsis oligantha*	Coastal-Plain golden-aster	G2G4
Talladega NF	Vascular Plant	*Plantago sparsiflora*	Pineland plantain	G3
Con	Vascular Plant	*Platanthera integra*	Yellow fringeless orchid	G3G4
Talladega NF	Vascular Plant	*Platanthera integrilabia*	White fringeless orchid	G2G3
Con	Vascular Plant	*Polygala hookeri*	Hooker's milkwort	G3
Talladega NF	Vascular Plant	*Polymnia laevigata*	Tennessee leafcup	G3
Oak	Vascular Plant	*Quercus arkansana*	Arkansas oak	G3
Con	Vascular Plant	*Rhexia salicifolia*	Panhandle meadowbeauty	G2
Con	Vascular Plant	*Rhododendron austrinum*	Orange azalea	G3
Con	Vascular Plant	*Rhynchospora crinipes*	Hairy peduncled beakrush	G1
Con	Vascular Plant	*Rhynchospora macra*	Large beakrush	G3
Con	Vascular Plant	*Rhynchospora pleiantha*	Coastal beaksedge	G2
Con, Oak	Vascular Plant	*Rhynchospora thornei*	Thorne's beaksedge	G1G2
Talladega NF	Vascular Plant	*Robinia viscosa*	Clammy locust	G3
Oak, Talladega NF	Vascular Plant	*Rudbeckia auriculata*	Eared coneflower	G1
Tusk	Vascular Plant	*Rudbeckia heliopsidis*	Sunfacing coneflower	G2
Talladega NF	Vascular Plant	*Rudbeckia triloba var pinnatiloba*	Pinnate-lobed black-eyed Susan	G4T2?
Con	Vascular Plant	*Ruellia noctiflora*	Night flowering ruellia	G2
Talladega NF	Vascular Plant	*Sabatia capitata*	Appalachian rose gentian	G2
Con	Vascular Plant	*Sarracenia leucophylla*	Crimson pitcherplant	G3
Con	Vascular Plant	*Sarracenia rubra* ssp. *wherryi*	Wherry's pitcherplant	G3
Oak	Vascular Plant	*Schisandra glabra*	Bay starvine	G3

Forest	Group	Scientific Name	Common Name	G-Rank
Bank, Talladega NF	Vascular Plant	*Scutellaria alabamensis*	Alabama skullcap	G2
Bank, Talladega NF	Vascular Plant	*Sedum nevii*	Nevius' stonecrop	G3
Bank	Vascular Plant	*Silene ovata*	Blue Ridge catchfly	G2G3
Oak	Vascular Plant	*Silene regia*	Royal catchfly	G3
Con	Vascular Plant	*Sporobolus curtisii*	Pineland dropseed	G3
Con	Vascular Plant	*Sporobolus floridanus*	Florida dropseed	G3
Bank	Vascular Plant	*Talinum calcaricum*	Limestone fameflower	G3
Bank	Vascular Plant	*Talinum mengesii*	Menge's fameflower	G3
Con	Vascular Plant	*Tephrosia mohrii*	Pineland hoarypea	G3
Talladega NF	Vascular Plant	*Thalictrum macrostylum (=T.subrotundum)*	Piedmont meadowrue	G1G2Q
Bank	Vascular Plant	*Thalictrum mirabile*	Little Mountain meadowrue	G2G3Q
Talladega NF	Vascular Plant	*Thaspium pinnatifidum*	Cutleaved meadow parsnip	G3?
Con	Vascular Plant	*Tofieldia glabra*	Smooth tofieldia	G3
Con	Vascular Plant	*Tridens carolinianus*	Carolina fluffgrass	G3
Bank, Oak, Talladega NF	Vascular Plant	*Trillium lancifolium*	Lanceleaf trillium	G3
Talladega NF	Vascular Plant	*Trillium rugelii*	Southern nodding trillium	G3
Bank	Vascular Plant	*Trillium simile*	Jeweled trillium	G3
Con	Vascular Plant	*Xyris chapmanii*	Chapman's yellow-eyed grass	G3
Con	Vascular Plant	*Xyris drummondii*	Drummond's yelloweyed grass	G3
Con	Vascular Plant	*Xyris isoetifolia*	Quillwort yelloweyed grass	G2
Con	Vascular Plant	*Xyris longisepala*	Kral's yelloweyed grass	G2
Con	Vascular Plant	*Xyris louisianica*	Louisiana yelloweyed grass	G3
Con	Vascular Plant	*Xyris scabrifolia*	Harper's yelloweyed grass	G3