

Biological Assessment/Evaluation  
Upper Brushy Stewardship – Mid Story Removal

**Biological Evaluation**

of

**Proposed, Threatened, Endangered and Sensitive Species  
Wildlife Habitat Improvement and Fuels Reduction Project**

by

**Mid-Story Removal**

**Proposed Action within Winston County, Alabama**

**Responsible Agency:  
USDA Forest Service  
National Forests in Alabama  
William B. Bankhead Ranger District**

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**Summary**

The proposed project will reduce midstory and understory trees and shrubs in the sites, as listed and noted on the attached maps. The project sites are located in the near the Walston Ridge Road and the Holmes Chapel areas of Bankhead National Forest. They are found in Forest Service management compartments 33 and 34. The sites proposed for treatment are predominantly mature loblolly pine stands with scattered hardwoods present in the overstory of all stands. These stands have not been maintained in an open woodland condition but will exhibit that condition upon project completion.

Hardwood and pine vegetation of approximately less than or equal to 6 inches diameter at breast height (DBH) will be removed in upland pine-dominant habitat. The result will be open pine stands with improved wildlife habitat and reduced fuel loading. The result will allow for restoration and maintenance of a fire dependent woodland system.

The purpose and need for the project is to decrease the risk of excessive damage of wildfires by reducing fuels, improve wildlife habitat, improve conditions for native upland plants, and restore and maintain native forest communities, specifically fire dependent woodlands.

Based upon the findings of this evaluation, this project will have **no effect** on the plants and animals that are federally listed on the Bankhead National Forest and will have **no impact** on the species listed as sensitive for the Bankhead.

Due to the findings of this assessment, further concurrence on this project with the U.S. Fish and Wildlife Service is not required.

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**INTRODUCTION**

The purpose of this Biological Evaluation (BE) is to determine whether the proposed action is likely to affect an endangered, threatened, proposed, or sensitive species. Forest Service Manual 2672.4 provides guidance to review programs and activities for possible effects to proposed, endangered, threatened, and sensitive species and to document findings.

The purpose and need for the project is to decrease the risk of damaging wildfires by reducing fuels, improve wildlife habitat, improve conditions for native upland plants, and restore and maintain native forest communities, specifically fire dependent woodlands.

The project will reduce midstory and understory trees and shrubs. The sites proposed for treatment are primarily loblolly pine stands with scattered hardwood. The midstory and understory will be reduced by cutting, mowing, grinding or other mechanical method. The result will be open pine stands with improved conditions for wildlife and reduced fuel loading in the understory. The result will allow for restoration and maintenance of a fire dependent woodland system.

The objectives of this Biological Evaluation are:

- to ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native plant or animal species or contribute to trends toward Federal listing of any species.
- to comply with the requirements of the Endangered Species Act that actions of Federal agencies not jeopardize or adversely modify critical habitat of Federally listed species.
- to provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision-making process.

The sites proposed for treatment are located within Winston County in the Bankhead National Forest (BNF). All sites are predominantly loblolly pine or pine with scattered hardwoods. All sites are located within established prescribed burn units. All sites are in Management Prescription 9C3 – Southern Cumberland Plateau Native Ecosystem Restoration and Maintenance – as identified in the Revised Land and Resource Management Plan. All sites are in Areas 2 as identified in the Bankhead’s Forest Health and Restoration Project’s Final Environmental Impact Statement. Maps of the sites are included in the appendix of this document.

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## **CONSULTATION HISTORY**

The Forest Health and Restoration Project and Environmental Impact Statement which outlines restoring native community types through reforestation and commercial thinning on almost 9,452 acres of the Bankhead was reviewed by the Fish and Wildlife Service during 2003. This project included the use of commercial thinning operations.

In that project, surveys were conducted on thousands of acres of loblolly pines stands in similar topographical locations to the stands proposed by this project. Some of the stands to be treated in this project are adjacent to tracts thinned through the Forest Health and Restoration Project. The Fish and Wildlife Service has actively participated on the Bankhead Liaison Panel which reviews forest projects such as this. Native forest community restoration on the Bankhead has been the primary discussion topic of the liaison panel for the past several years.

The Fish and Wildlife Service (FWS) has reviewed and concurred with many past projects that were similar in treatment method and project goals. Examples include mid-story removal projects in longleaf pine stands, roadside fuels management project and annual prescribed burning program.

The project tiers to the National Forests in Alabama's Revised Land and Resource Management Plan and associated Biological Assessment and Evaluation. All sites are in Management Prescription 9C3 – Southern Cumberland Plateau Native Ecosystem Restoration and Maintenance – as identified in the Revised Land and Resource Management Plan. This project tiers to the BNF Forest Health and Restoration Project and associated Biological Assessment and Evaluation. All sites are in Areas 2 & 3 as identified in the Forest Health and Restoration Project's Final EIS.

## **PROPOSED MANAGEMENT ACTION**

The proposed project will reduce midstory and understory trees and shrubs in the project sites, totaling 242 acres. Hardwood and pine vegetation between approximately less than or equal to 6 inches diameter breast height (DBH) will be removed in upland pine and pine-hardwood dominant habitat. The midstory and understory will be reduced by a combination of mechanical methods. A mower or mulcher-type machine may be used in combination with chainsaws where needed. The mower may be mounted upon a tracked or rubber tire tractor or similar vehicle. Herbicides will not be used. Snags and den trees important to wildlife will not be treated. Selected dogwoods and other mast producing trees will be retained. Riparian areas, glades, outcrops, wetlands or other rare communities will not be treated.

The sites proposed for treatment are predominantly loblolly pine or pine and hardwood stands. The sites are mature stands that have had prescribed burning, midstory treatments and/or have been thinned in the past. These stands have not been maintained in an open woodland condition in the recent past. The expected result of this project is that midstory and understory treatment will open up the stands allowing them to be maintained through prescribed burning to achieve an open woodland conditions.

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**Listing of Sites**

<b>FS Mgt. Compartment/Stand</b>	<b>Approximate Area</b>	<b>Section/Township/Range</b>
33/22	46 acres	08 / 9S / 7W
31/11	33 acres	10 / 9S / 7W
33/18	38 acres	08 / 9S / 7W
34/10	47 acres	04-05 / 9S / 7W
34/18	34 acres	05 / 9S / 7W
33/09	44 acres	06-07 / 9S / 7W
	Total 242 acres	

**SPECIES CONSIDERED AND SPECIES EVALUATED**

District Biological Science Technician Allison Cochran and District Wildlife Biologist Tom Counts have conducted literature reviews and field reviews of the project sites for presence of listed species and suitable habitat. The BNF district office keeps current records of locations of known listed species throughout the area, which were reviewed as part of this evaluation. All areas which may be disturbed or impacted, by this project were surveyed for presence of protected species. A review of all caves within the area was also conducted.

All currently listed threatened, endangered, protected and sensitive species (Regional Forester's Sensitive Species list) were considered during this evaluation. Some of the species are not known to occur on the BNF at the present time but potential habitat was assessed for effects. This evaluation considered species range, life history information, available habitat information, and known locations to determine which species to evaluate. See the following table for a listing of species considered.

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**Federally Listed Species of the Bankhead National Forest**

Scientific Name	Common Name	Status <sup>1</sup>	Habitat	Notes	Within Affected Area? May be affected by the project?
<i>Myotis grisescens</i>	Gray Bat	E	1	Known from Lawrence County.	No. Species not known to occur in Winston County.
<i>Myotis sodalis</i>	Indiana bat	E	1	Known from Lawrence County.	No. Sites are distant from known occupied habitat. Species not known to occur in Winston County.
<i>Haliaeetus leucocephalus</i>	Bald Eagle	T	11	Known sites occur on Smith Lake.	No. Nest habitat along Smith Lake will not be affected.
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	17	Does not occur on Bankhead	No.
<i>Sternotherus depressus</i>	Flattened musk turtle	T	A	Occurs on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Epioblasma brevidens</i>	Cumberlandian combshell	E	A	Does not occur on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Epioblasma metastrata</i>	Upland combshell	E	A	Has not been recorded within the Black Warrior drainage since the 1900's.	No. Aquatic species will not be affected by this project.
<i>Epioblasma turgidula</i>	Turgid blossom pearly mussel	E	A	Does not occur on Bankhead and may be extinct.	No. Aquatic species will not be affected by this project.
<i>Lampsilis altilis</i>	Fine-lined pocketbook	E	A	Occurs on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Lampsilis perovalis</i>	Orange-nacre mucket	T	A	Occurs on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Medionidus acutissimus</i>	Alabama moccasinshell	T	A	Occurs on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Medionidus parvulus</i>	Coosa moccasinshell	E	A	Has not been recorded on Bankhead in recent years.	No. Aquatic species will not be affected by this project.
<i>Pleurobema furvum</i>	Dark pigtoe	E	A	Occurs on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Pleurobema perovatum</i>	Ovate clubshell	E	A	Has not been recorded on Bankhead in recent years.	No. Aquatic species will not be affected by this project.
<i>Pleurobema plenum</i>	Rough pigtoe	E	A	Does not occur on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Ptychobranhus greeni</i>	Triangular kidneyshell	E	A	Occurs on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Lampsilis orbiculata (L. abrupta)</i>	Pink mucket pearly mussel	E	A	Does not occur on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Dalea foliosa</i>	Leafy prairie clover	E	6	Not documented on Bankhead.	No. Glade species will not be affected by this project.
<i>Helianthus eggertii</i>	Eggert's sunflower	T	8	Not documented on Bankhead.	No. Potential habitat may be affected.
<i>Lesquerella lyrata</i>	Lyrate bladder-pod	T	6	Not documented on Bankhead.	No. Glade species will not be affected by this project.
<i>Marshallia mohrii</i>	Mohr's Barbara's Buttons	T	2	Not documented on Bankhead.	No. Potential habitat not present.

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<i>Sagittaria secundifolia</i>	Kral's water-plantain	T	A	Occurs on Bankhead.	No. Aquatic species will not be affected by this project.
<i>Thelypteris pilosa var al.</i>	Alabama streak-sorus fern	T	7	Occurs on Bankhead.	No. Potential habitat is not present and will not be affected.
<i>Xyris tennesseensis</i>	Tennessee yellow-eyed grass	E	11	Species not documented on Bankhead.	No. Potential habitat is not present within the project area.

<sup>1</sup>E = endangered; T = threatened

Habitat Code

- 1 = Cave Habitats
- 2 = Wetland (Bog) Habitats
- 6 = Glades, Prairies, and Woodlands Habitats
- 7 = Rock Outcrop and Cliff Habitats
- 8 = Grass/Forb Habitats
- 10 = Mid- to Late- Successional Deciduous Forest Habitats
- 11 = Forest Riparian Habitats
- 12 = Habitat Generalist
- 13 = Area Sensitive Mid- to Late- Successional Deciduous Forest Habitats
- 17 = Southern Yellow Pine Forests and Woodland Habitats
- 18 = Mixed Mesic Forest Habitats
- 19 = Mixed Xeric Forest Habitats
- 20 = Shrub/Seedling/Sapling Habitats
- 21 = Seeps and Springs Habitats
- A = Aquatic Species

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**Forest Service Sensitive Species**

Scientific Name	Common Name	Status <sup>1</sup>	Rank	Habitat	Within Affected Area? May be affected by the project?
<i>Aesculus parviflora</i>	Small flowered buckeye	S	S2S3G2G3	18	No
<i>Astragalus tennesseensis</i>	Tennessee Milkvetch	S	S1G3	6	No
<i>Aureolaria patula</i>	Spreading yellow false foxglove	S	S1G2G3	7	No
<i>Carex brysonii</i>	Bryson's sedge	S	S1G1	18	No
<i>Delphinium alabamicum</i>	Alabama larkspur	S	S2G2	6	No
<i>Diervilla rivularis</i>	Riverbank bush-honeysuckle	S	S2G3	11	No
<i>Hymenophyllum tayloriae</i>	Gorge filmy fern	S	S1G1G2	7	No
<i>Jamesianthus alabamensis</i>	Alabama jamesianthus	S	S3G3	11	No
<i>Juglans cinerea</i>	Butternut	S	S1G3G4	18	No
<i>Leavenworthia alabamica</i> <i>var. alabamica</i>	Alabama Gladecress	S	T2T3G2G3	6	No
<i>Leavenworthia crassa</i>	Fleshyfruit Gladecress	C&S	S1G2	6	No
<i>Lesquerella densipila</i>	Duck River Bladderpod	S	SHG3	6	No
<i>Monotropsis odorata</i>	Sweet pinesap	S	G3	10	Not known from the project area. Potential habitat present.
<i>Asplenium x ebenoides</i>	Scott's Spleenwort	S	HYBS1	7	No
<i>Marshallia trinervia</i>	Broadleaf Barbara's buttons	S	S3G3	11	No
<i>Minuartia alabamensis</i>	Alabama Sandwort	S	S2G2Q	6	No
<i>Neviusia alabamensis</i>	Alabama snow-wreath	S	S2G2	6	No
<i>Platanthera intergrilabia</i>	White fringeless orchid	C&S	S2G2G3	2	Not known from the project area. Potential habitat is present.
<i>Polymnia laevigata</i>	Tennessee Leafcup	S	S2S3G3	18	No
<i>Robinia viscosa</i>	Clammy Locust	S	G3	17	Not known from the project area. Potential habitat present.
<i>Rudbeckia triloba</i> <i>var. pinnatifida</i>	Pinnate-lobed Black-eyed Susan	S	S2S3G4T2	7	No
<i>Scutellaria alabamensis</i>	Alabama skullcap	S	S2G2	7	No
<i>Sedum nevii</i>	Nevius' stonecrop	S	S3G3	7	No
<i>Silene ovata</i>	Blue Ridge catchfly	S	S1G2G3	7	No
<i>Talinum calcaricum</i>	Limestone Fameflower	S	S2G3	6	No
<i>Talinum mengesii</i>	Menge's fameflower	S	S2S3G3	6	No
<i>Thalictrum mirabile</i>	Little mountain meadow rue	S	QS1G2G3	7	No
<i>Trillium lancifolium</i>	Lanceleaf Trillium	S	S2S3G2	11	No
<i>Trillium simile</i>	Jeweled Trillium	S	G3	18	No
<i>Speyeria diana</i>	Diana Fritillary	S	S3G3	11	Not known from the project area. Potential habitat present.
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared bat	S		10	No
<i>Cheilolejeunea evansii</i>	A liverwort	S	S1G1	11	No
<i>Aneura maxima</i>	A liverwort	S	G1G2	11	No
<i>Pellia X appalachiana</i>	A liverwort	S	G1G2	11	No

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<i>Nardia lescurii</i>	A liverwort	S		11	No
<i>Plagiochila echinata</i>	A liverwort	S	G2	11	No
<i>Radula sullivantii</i>	A liverwort	S	G2	11	No
<i>Riccardia jugata</i>	A liverwort	S	G1G2	11	No
<i>Hydroptila paralatosa</i>	A caddisfly	S	S2G2	A	No
<i>Rhyacophila carolae</i>	A caddisfly	S	S1G1	A	No
<i>Elliptio arca</i>	Alabama spike	S	S2G3	A	No
<i>Obovaria jacksoniana</i>	Southern Hickorynut	S	S2G1G2	A	No
<i>Obovaria unicolor</i>	Alabama Hickorynut	S	S2G3	A	No
<i>Strophitus subvexus</i>	Southern creekmussel	S	S2G3	A	No
<i>Villosa nebulosa</i>	Alabama rainbow	S	S3G3	A	No
<i>Etheostoma bellator</i>	Warrior darter	S	S2G2	A	No
<i>Etheostoma douglasi</i>	Tuskaloosa darter	S	S2G2	A	No
<i>Etheostoma phytophyllum</i>	Rush darter	S	S2G2	A	No
<i>Etheostoma tuscumbia</i>	Tuscumbia darter	S	S1G1	A	No
<i>Percina sp.cf.macrocephala</i>	Longhead darter (Warrior Brinled Darter)	S	G3	A	No
<i>Necturus alabamensis</i>	Black Warrior waterdog	S	S2G2	A	No

<sup>1</sup>S = sensitive; C = candidate for Federal listing

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Habitats

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All species listed for the Bankhead National Forest as threatened or endangered by the US Fish and Wildlife Service and as sensitive by the Regional Forester were considered, but some were excluded from further evaluation. Potential habitat was assessed for effects. A discussion of the excluded species and the reasons for exclusion follows.

***Federally Listed Species (Threatened and Endangered Species)***

Gray bat and Indiana bat. Small populations of these two species of bats were found within Bankhead National Forest in Lawrence County during 1999. Their presence has been verified in subsequent years. These two bat species have not been encountered in Winston County. No known or potential habitat for these species will be impacted by this project. Snags and similar trees known to be habitat for these bats will not be disturbed. Known hibernacula are over six miles from the nearest project area.

Bald eagle. The bald eagle has been a winter and spring resident around portions of Bankhead National Forest that border the Lewis Smith Lake. This species is threatened throughout its range by habitat loss, disturbance by humans, contaminants, decreasing food supply and illegal shooting.

Two inactive bald eagle nests were confirmed within the Bankhead during 2004. Monitoring in 2005 has revealed that one nest is currently active although not successful. The project areas do not contain suitable habitat for bald eagle nest sites.

Red-cockaded woodpecker. There has been no record of a red-cockaded woodpecker at the Bankhead National Forest since the early 1990's. Informal conversations with Ralph Costa of the Fish and Wildlife Service resulted in agreement that the red-cockaded woodpeckers are no longer present here.

Flattened Musk Turtle The flattened musk turtle is an aquatic species that is found within the upper Black Warrior drainage. This species generally requires clear gravel bottomed streams with rocky outcroppings and pools 3 to 5 feet in depth. Clear streams are necessary for the production of filter feeders (mussels), which are the primary source of food for this species. The rocky crevices and outcroppings provide cover for the turtle. This species is found in the perennial streams of the Sipsey Fork, Brushy Creek, Clear and Caney Creeks and their primary tributaries.

Threats include overcollection, disease, habitat degradation from sedimentation and water pollution, habitat fragmentation and human-caused catastrophes and accidents (for example accidental spills).

The proposed project is outside of the known habitat but is within the same watershed of existing habitat. Mitigation measures are in place to preclude sedimentation of streams and no soil disturbance is anticipated with the project. Streams are not included within the proposed project areas.

Mussels - turgid blossom, pink mucket pearly, rough pigtoe and cumberlandian combshell mussels. Three of these species of mussels (turgid blossom, pink mucket pearlymussel, and rough pigtoe) are listed as having historic range within Lawrence County, Alabama. Their habitat was associated with the Tennessee River and its large tributaries. The turgid blossom is not known to occur in streams of the Bankhead. The turgid blossom is considered by some to be extinct. The rough pigtoe is currently known only to occur in a few sites in the Tennessee, Clinch, Cumberland, Barren and Green Rivers. This species is not known to occur within Bankhead. The pink mucket is distributed in Colbert, Lauderdale, Limestone, Madison, Marshall, and Morgan counties in Alabama. The pink mucket is a large river species known from the Mississippi, Tennessee, Ohio and Cumberland river systems.

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The turgid blossom mussel is considered to be extinct by the Fish and Wildlife Service and has never been found within the streams of Bankhead National Forest. The habitat for the pink mucket pearly mussel is considered to be larger rivers and their tributaries, such as the Ohio and Tennessee Rivers. This species has never been recorded within the streams of Bankhead National Forest and is not expected to occur here. The rough pigtoe is found within the Tennessee River proper and thus will not be found within Bankhead National Forest.

The fourth, cumberlandian combshell, may have had historic range within north Alabama, as the habitat was associated with the Tennessee River. However, records do not indicate that it is currently found in or near the Bankhead National Forest. None of these four species are listed by the US Fish and Wildlife Service within Winston County.

Appropriate stream habitat is not included within the proposed project areas. Mitigation measures are in place to preclude sedimentation of streams and no soil disturbance is anticipated with the project.

Mussels - Orange-nacre mucket, Alabama moccasinshell, Coosa moccasinshell, triangular kidneyshell, dark pigtoe, fine-lined pocketbook, upland combshell, ovate clubshell.

These are aquatic species with habitat on Bankhead National Forest. The historic and current habitat for many of these include the Sipsey Fork, Thompson, Flannagin, Borden, Caney, North Fork Caney, Brushy, Capsey, Rush, Brown and Beech Creeks within Bankhead National Forest.

The Coosa moccasinshell and the ovate clubshell have not been recorded on the BNF in recent years, although it is within their historic range. There are no population estimates for the Coosa moccasinshell. The ovate clubshell is rare throughout its range.

The triangular kidneyshell's current range includes the Sipsey Fork in the Black Warrior River drainage. Population estimates for this species are not known. Its range is extremely limited. This limited range, combined with low species numbers make it very vulnerable to threats. Threats include impoundment of habitat and over utilization for commercial, recreational, scientific, and educational purposes.

The upland combshell was historically known from the Black Warrior River drainage in Alabama. This species has not been observed within streams of the Black Warrior since the early 1900's. Threats to this species include habitat modification, sedimentation, and other forms of water quality degradation.

The current distribution of the dark pigtoe is limited to the tributaries of the Sipsey Fork in Winston County, where it is most common, and the North River in Tuscaloosa and Fayette counties. This species is generally rare wherever it occurs. Population estimates are not known. This species is sensitive to impoundment, habitat modification, sedimentation, and water quality degradation.

The current distribution of the fine-lined pocketbook is believed to be limited to the headwaters of the Sipsey Fork of the Black Warrior River drainage and a few other streams in Alabama and Georgia. Threats to this species include habitat modification, sedimentation and water quality degradation. Historically this species was spread throughout the Mobile River Basin, but currently there are only eight records for this species within the historic range.

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The orange-nacre mucket was historically known from Brushy Creek, Mulberry and Sipsey Forks in the Black Warrior River drainage in the area around Bankhead National Forest. It has disappeared from many streams within its historic range. Population estimates are unavailable for this species, although it is described as being common in a few streams in Bankhead National Forest. And, these populations within Bankhead may be stable, according to Nature Serve records. Threats to this species include habitat modification, sedimentation and water quality degradation. This species is reported to be relatively tolerant of nondestructive intrusion, though heavy recreational use of mussel habitat could be disruptive.

The current range of the Alabama moccasinshell includes the headwaters of the Sipsey Fork in the Black Warrior River drainage (Brushy Creek) where this species is considered to be locally common and the populations stable. Threats to this species include habitat modification, sedimentation and water quality degradation.

Water quality, cool temperatures and continuous flow are major considerations in the viability of these animals. Measures to protect these characteristics are necessary for all actions within the Black Warrior Drainage system. Threats to these species include habitat modification, sedimentation and water quality degradation.

The proposed project is outside of the known habitat for these species but is within the same watershed of existing habitat. Mitigation measures are in place to preclude sedimentation of streams and no soil disturbance is anticipated with the project. Although the project is considered to be potentially ground disturbing, there is little opportunity for soil disturbance. Appropriate stream habitat is not included within the proposed project areas.

Leafy Prairie Clover. This species has not been found on the Bankhead National Forest. Habitat of the leafy prairie clover in Alabama is described as thin-soiled limestone glades and limestone barrens. In Tennessee, this plant occurs on wet calcareous barrens and moist prairies or cedar glades, usually near a stream or where some seepage from limestone provides seasonal moisture. Leafy prairie clover requires full sun and low competition. Periodic fire is required to maintain these conditions.

This species has declined throughout its range due to habitat destruction and alteration due to development, overgrazing, and fire suppression. It is highly threatened by continued habitat loss due to land use change. Additionally, sites in Tennessee are threatened by exotic, invasive shrubs like privet and bush honeysuckle. The proposed project areas do not include habitat for leafy prairie clover.

Lyrate bladderpod. This species has not been found on the Bankhead National Forest. The six known populations of this plant occur in Franklin, Lawrence and Colbert counties, Alabama.

This plant's habitat is described as red soils, limestone outcroppings, disturbed cedar glades and glade-like areas (open pastures, fields, and roadsides in calcareous areas). This species is restricted to shallow soils. This plant requires periodic disturbance to maintain the open cedar glade habitat where it occurs. It is threatened by woody plant succession and habitat loss or modification.

The proposed project areas do not include habitat for lyrate bladderpod.

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Mohr's Barbara's buttons. This species occurs in moist prairie-like openings in woodlands and along shale-bedded streams in a grass-sedge community. Some populations are also located within road rights-of-way that are seasonally wet. One population was recently discovered within the administrative boundary of the Bankhead National Forest although on private land. This plant is only known from north-central Alabama to northwest Georgia.

Threats include road widening and right-of-way maintenance activities including mowing, herbicide application, and planting of aggressive competitors. Habitat conversion and encroachment of woody species in the absence of fire are also threats to populations.

A detrimental impact to the species is not expected or anticipated due to the fact that the plant has not been encountered on National Forest lands. This species has not been observed within the project areas nor is suitable habitat available.

Alabama Streak Sorus Fern. The known range of this plant includes a 5 km stretch of the Sipsey River in Winston County. Where it is found, in rock shelters along the Sipsey, it is locally abundant.

Threats to this fern include impoundments, bridge construction, logging of upslope forests, vandalism, and incidental damage from recreational use of the habitat.

No plants were observed within the proposed project areas nor is habitat for them present within proposed treatment areas. Any areas with potential habitat for this species was excluded from the project proposal.

Kral's water plantain. This is an aquatic perennial plant that occurs along Sipsey and Caney Creeks. It is only known from three tributaries in northern Alabama and Georgia. Kral's water plantain (also known as Little River Arrowhead) occurs in undammed riverine reaches on exposed shoals or rooted among loose boulders in sands, gravels, and silts in pools up to 1 meter deep. Stream bottoms are typically narrow and bounded by steep slopes. Locally distributed, but where suitable habitat exists, the plants grow in nearly pure stands.

Siltation, impoundments, and eutrophication due to sewage are threats to this species.

Appropriate stream habitat is not included within the proposed project areas. Mitigation measures are in place to preclude sedimentation or direct impact to streams. Erosion control (mitigation measures) will be utilized where indicated by FS personnel to control erosion.

Tennessee yellow-eyed grass. This species has not been found on the Bankhead National Forest. Twenty populations are known in Alabama, Georgia and Tennessee.

This species is vulnerable to land-use conversion and habitat fragmentation resulting mainly from highway construction and alteration of wetlands. It is also threatened by right-of-way maintenance.

Tennessee yellow-eyed grass may be found in moist- to wet places including, on seepage slopes, springy meadows, bogs, and banks of small streams, in open areas or thin woods where calcareous rock is at or near the surface or on thin calcareous soils.

No plants were observed within the proposed project areas nor is habitat for them present.

Soils in the area are slightly acidic which is not suitable for this species. Wetlands within the project area are excluded from heavy equipment use.

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*Forest Service Sensitive Species*

SMALL-FLOWERED BUCKEYE and BUTTERNUT

Small-flowered Buckeye is found in rich mesic woods and along creek margins.

Butternut is found primarily on, but not limited to, limestone-derived soils, heavy clay-like soils, and well-drained soils associated with bottomlands and floodplain woods, or calcareous mesic woods. Butternut is found in rich hardwoods and streamside margins, especially in calcareous alluvial depositions along the streams. This tree rarely occurs in pure stands. It is shade-intolerant. The major threat to butternut throughout its entire range is the butternut canker disease. Lack of disturbance and shading are also threats to successful reproduction of butternut. These species were not encountered within the proposed project areas although suitable habitat does exist adjacent to treatment areas.

TENNESSEE MILKVETCH and MENGE'S and LIMESTONE FAMEFLOWER

Tennessee Milkvetch is found on limestone glades in Morgan County. Potential habitat exists within the BNF. Menge's fameflower is associated with cedar glades, limestone or sandstone outcrops, sandstone cliffs or rocks. Menge's fameflower is found in soil pools within expanses of flat sandstone outcrops that are large enough to allow full sunlight or near full sunlight on the outcrop. Although no plants were found during surveys of the proposed project areas, these plants are present throughout the Bankhead National Forest in glade type habitats. Limestone fameflower is also associated with glades and rock outcrops. It has not been encountered in the Bankhead National Forest. Limestone fameflower is known from the Nashville Basin and calcareous lowlands of middle Tennessee, from northern Alabama, and from Kentucky. This locally abundant plant is threatened by urban expansion and conversion of some open glades to low-quality pasture.

Glade habitats are not present within the proposed project areas.

SPREADING YELLOW FALSE FOXGLOVE

This species has been encountered in Cherokee County. Other species of *Aureolaria* are found on a variety of sites from upland hardwoods to sandy sites of the coastal plain. This particular species is found on river bluffs in Tennessee.

Threats include destroying overstory shading, allowing invasion of exotic weeds, runoff and erosion.

This species is not known to occur in Bankhead National Forest. The proposed project will not threaten this species as potential habitat is not present.

BRYSON'S SEDGE

This species is associated with, but not limited to, low wet woods or areas commonly considered being riparian areas within streamside management zones. It needs mesic conditions and at least partial shade to survive. They are not limited to a particular soil type, but do include moist, sandy loams. Bryson's sedge is found in rich deciduous woods or on bluffs above streams. It is a newly identified plant (1993) and little is known about its life science. Bryson's sedge is apparently narrowly endemic to gorges of a single drainage in the Cumberland Plateau physiographic province in Alabama.

Threats include land-use conversion and habitat fragmentation. The project areas do not contain habitat for this species as treatment sites are upland pine habitats.

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**ALABAMA LARKSPUR**

This species is associated with cedar glades, limestone or sandstone outcrops, sandstone cliffs or rocks, and surrounding open woodlands and in prairies. The larkspur is found in prairies, limestone cedar glades or open woods bordering these habitats. It is found thriving on basic clay soils derived from calcareous rocks. This plant has been encountered by Gunn in the Oakville quadrangle on cedar glades and adjacent cedar woodlands. The proposed project areas do not include glade habitats.

**RIVERBANK BUSH-HONEYSUCKLE**

*Diervilla rivularis* is a localized Southern Appalachian endemic. It occurs in a few counties in northwestern Georgia and in only a few counties in northeastern Alabama. This species is found along streams in riparian areas. This plant is somewhat threatened range-wide by land-use conversion, habitat fragmentation, and forest management practices. Stream habitat and associated riparian areas are not included within the project areas.

**GORGE FILMY FERN**

This species is somewhat to very epipetric in that they are usually found growing directly on more or less vertical rock faces. Gorge filmy fern grows on moist bluff faces. It is restricted to deeply sheltered, continuously moist habitats in the southern Appalachians, including the ceilings of moist grottos, cliff crevices in narrow stream gorges, and waterfall spray zones on cliffs. This species is considered to be highly threatened throughout its range because of its limited distribution and restricted habitat. The proposed project areas do not include filmy fern habitat.

**JAMESIANTHUS**

This species is associated with, but not limited to, low wet woods or areas commonly considered as streamside management zones. They need mesic conditions and at least partial shade to survive. *Jamesianthus* is found in silty sand or gravelly margins of streams, especially where streams cut through limestone, in full or partial sun.

This species is known from six counties in Alabama and has been reported in Georgia, where its status is unknown. Threats include grazing, trampling, erosion, silt deposition, land-use conversion, habitat fragmentation, and forest management practices.

Soil disturbance along stream margins may create openings for opportunistic weedy species, which will adversely impact *Jamesianthus* habitat.

A review of existing records of occurrence and field surveys reveal that this species has never been found within or adjacent to the project sites. The project areas do not provide suitable habitat.

**FLESHY-FRUIT and ALABAMA GLADECRESS**

Fleshy-fruit gladechress has been encountered on two glades within the Bankhead National Forest. It is endemic to Lawrence and Morgan counties in Alabama and verified from six sites in those two counties. It occurs on limestone glades, fallow fields and along roadsides in sunny, open habitats. This gladechress is highly threatened by human disturbance, including ATV use and trash disposal on glades. Alabama gladechress is associated with limestone glades and is known from Franklin and Lawrence counties.

Limestone glades, from which these species are known are not present within the project areas.

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**DUCK RIVER BLADDERPOD**

This species is only known from four counties in Alabama and from approximately fifty occurrences in seven counties in Tennessee. This species is known to occur in Franklin and Marshall counties in calcareous fields and pastures. Agriculture, stream modification, dam construction and competition with grasses all pose threats to this species.

It has not been encountered within the BNF and is not expected to occur within the project areas. Potential habitat is not present within any of the project sites.

**LITTLE MOUNTAIN MEADOW RUE, NEVIUS' STONECROP, LIVERWORTS AND SCOTT'S SPLEENWORT**

These species are somewhat to very epipetric in that they are usually found on more or less vertical rock faces.

Little mountain meadow-rue is restricted to wet sandstone habitats and known only from eastern Kentucky and Tennessee, south to northern Alabama. Like the other epipetric species considered here, habitat is difficult to access limiting threats.

Stonecrop is most likely on rock faces or bluffs above creeks and rivers on limestone or shale, and on limestone outcrops in woodlands growing amongst various mosses under light to heavy shade. It is restricted to a total of 8 counties in north-central Alabama, west-central Georgia and southeastern Tennessee. Nevius' stonecrop is threatened primarily by factors that dry out its habitat or intensively shade it. The rocky, bluff habitats of this species make it difficult to access; therefore, it is not severely threatened range-wide.

Liverworts are moss-like, non-vascular plants that grow on damp ground, rock outcrops, spray cliffs, and downed wood. These species are found in late successional riparian forests. *Plagiochila echinata* is reported to occur on rocks and stream banks in humid gorges and in the spray zone of waterfalls when encountered in North Carolina. *Cheilolejeunea evansii* is known from eleven extant occurrences in the southern Appalachians in western North Carolina, western South Carolina and north-central Alabama. This liverwort is found at lower elevations on the bark of trees in moist gorges and gorge-like habitats. It may occur on standing trees at just above ground level to 3 meters up the trunk on a variety of mesic to dry-mesic hardwoods. Threats to this liverwort include clear cutting or activities that would result in the removal of trees in the vicinity of the bryophyte.

Scott's spleenwort is epipetric. It is found in cool rock crevices (limestone, sandstone, or conglomerate cliffs) with a northern exposure. It is also associated with moist, shady habitats. It is not known from BNF, but has been encountered in Jefferson County.

The proposed project sites do not contain the appropriate type of habitat for any of these epipetric species. None of these species were found during field reviews.

**BROADLEAF BARBARA'S BUTTONS**

Broadleaf Barbara's buttons is endemic to the southeast and is known from several states, but is not common. This species is restricted to specialized seepy calcareous habitats. This species has been described as being found in pinelands and damp woods. It is not known from the Bankhead. Habitat for this plant is generally unsuitable for other uses, but land-use conversion and fragmentation are considered threats.

The proposed project areas do not contain the seepy calcareous habitat required by broadleaf Barbara's buttons. Sites of this nature were excluded from proposed treatment.

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**ALABAMA SANDWORT**

Alabama sandwort is not currently known from any locations on the Bankhead, although it has been found within one mile of the administrative boundary. This species is an Alabama endemic and is associated with glades, barrens, and rock outcrops.

The proposed project areas do not contain glade, barren, or rock outcrop habitat.

**ALABAMA SNOW-WREATH**

This plant is rare throughout its range, with widely scattered populations that are mostly or entirely clonal. It is known to occur on forested bluffs, talus slopes, and streambanks. It occurs on a variety of geologic substrates, soils and aspects, and under open- to completely closed-canopy conditions. This species has not been recorded in BNF, or in Winston, Lawrence or Franklin counties. It has been recorded from DeKalb, Jackson, Madison, and Tuscaloosa counties.

Nature Serve lists potential threats as timber harvesting, recreational development, encroachment by undesirable weedy species, grazing, urban expansion, and forest management practices.

Habitat for this plant is not present within the proposed project sites.

**TENNESSEE LEAFCUP**

Tennessee leafcup occurs mainly on rich wooded slopes in light to dense shade of mixed mesophytic woods on moist loamy and rocky substrates. In Tennessee, habitat includes limestone bluffs, ridges, rocky creek bottoms, and mixed mesophytic forest slopes on the Cumberland Plateau. In Kentucky, it occurs on rich, mesic wooded slopes on loess or alluvial slopes. In Florida, it occurs on thin moist soils directly over limestone bedrock.

Across its range, threat may include logging operations and grazing that result in competition from non-native plants.

This species has not been observed within the project sites nor is potential habitat available. Sites proposed for treatment in this project are upland pine stands.

**PINNATE-LOBED BLACK-EYED SUSAN**

This species may be found in riparian areas, on moist shaded hardwood slopes, on rich soils and in association with rock outcrops and cliffs. It is known from 27 sites in the state of Alabama.

Range-wide threats include land-use conversion and habitat fragmentation. This species does not tolerate disturbance or over-drying of soils.

This plant has not been encountered at the project sites. The project areas do not contain rock outcrops, cliffs, or riparian areas.

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#### ALABAMA SKULLCAP

This species is known to occur in Calhoun, Cullman, Etowah, Jefferson and St. Clair counties. It is associated with moist clearings in oak-pine flats. Habitat is described as moist shaded hardwood slopes and rich soils; mixed pine-hardwoods; and forest margins.

This plant was not encountered during field surveys and is not known to occur in the Bankhead National Forest.

#### BLUE RIDGE CATCHFLY

*Silene ovata* is associated with cliffs, rock barrens, sandstone outcrops and rock houses in rich woods. Although it has been recorded only from Dallas, Geneva, and Marengo counties, suitable habitat does exist on the BNF, but not within the project areas.

Range-wide threats include heavy logging, grazing, flooding by impoundment, clearcutting, construction and quarrying projects that destroy this species habitat.

Potential habitat is not present within the project sites and will not be affected by the project. This plant was not encountered during field surveys.

#### TRILLIUMS

Jeweled trillium is known from the Bee Branch area of the BNF. The habitat of this plant is described as rich coves under mature trees, in rhododendron thickets along streams, and at forest edges, frequently on outcrops partially exposed by road building. The plant is associated with moist, “humus” soil.

Lanceleaf trillium flourishes in alluvial soils and floodplains. It has been encountered growing in rocky upland woods and brushy thickets. It is commonly associated with moist to wet soils.

Trilliums have not been encountered within any of the project sites. The rich and moist soil habitat required by these species is not available within the project areas although they may be adjacent to the treatment areas.

#### CADDISFLIES

Two sensitive species of caddisflies may be found in the BNF. *Hydroptila paralatosa* is found in small streams of the fall line and has been collected in Winston County. *Rhyacophila carolae* has been collected in a small tributary of Bee Branch in the BNF.

Caddisflies are confined to water during the majority of their life cycle. Adults of most species are inactive during the day and active during the evening (Harris et al., 1991).

Threats and population estimates are not available from Nature Serve for these species.

Stream habitat and associated riparian areas are not included within the project areas. Mitigation measures are in place to preclude sedimentation of streams and no soil disturbance is anticipated with the project.

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**ALABAMA SPIKE, SOUTHERN CREEKMUSSEL, SOUTHERN HICKORYNUT, ALABAMA HICKORYNUT, ALABAMA RAINBOW**

Suitable habitat for these aquatic species exists on BNF. All of these mussel species require habitat stability, including substrate and water quality. These species are sensitive to water quality degradation; sedimentation being an important factor. Ground disturbing activities within a watershed are potential sediment sources. Reservoirs and other waterway projects, as well as kaolin strip mines have altered Alabama Spike habitat in some areas of this species range. These threats are not currently factors on the Bankhead. Several of these species have been collected in the northern portion of the BNF, including the Alabama spike, southern creekmussel and the Alabama rainbow (McGregor, 1992).

Alabama spike is known to occur in high gradient streams. Data are limited on population trends for the Alabama spike throughout its range. Additionally, some taxonomic confusion and lack of status surveys contribute to the lack of abundance data/records. The Alabama spike (*Elliptio arca*) may be the same species as the delicate spike (*Elliptio arctata*).

The southern creekmussel is most common in mid-channel river habitats in most of its range. These habitats are threatened by excess sedimentation, channel modifications, impoundments, water withdrawals, urbanization and point and non-point pollution.

The Alabama hickorynut is restricted to large streams in the Mobile Basin. It has been extirpated from most of the historical range by stream impoundment and channelization and water quality degradation. This species is currently declining globally and is generally uncommon. It is relatively tolerant of nondestructive intrusion, but heavy recreational use of habitat could be disruptive.

The Southern hickorynut was historically distributed from Alabama to Eastern Texas, and in the Mississippi embayment as far north as southeastern Missouri. Alabama counties included in distribution records include Greene, Pickens, Sumter, and Tuscaloosa counties.

These species are not expected to exist within the proposed project areas. No mussels were encountered during field surveys as perennial streams are not present within the project areas. Mitigation measures are in place to preclude sedimentation of streams and no soil disturbance is anticipated with the project.

**DARTERS**

Tuskaloosa darter is found in streams with moderate to swift flow. It will be found in cobble, gravel and slab riffles. It has been collected in Sipsey Fork, Borden Creek, Rush Creek and Capsey Creek in the Bankhead. This species was not collected during Biomonitoring in the Upper Mulberry Fork Watershed, 1999-2001 conducted by Geological Survey of Alabama. The Tuskaloosa darter has a small range and limited number of occurrences, but it is abundant where it does occur. The populations are considered to be stable. Threats include timber practices, coal mining, proposed reservoirs, and siltation resulting from increased urbanization.

The warrior darter is found in small to medium streams with moderate flow. This species will be found in rubble, bedrock, and gravel-filled pools. This species feeds on aquatic insect larvae. Warrior darter has been collected in the following creeks on Bankhead National Forest; Thompson, Borden and Sipsey Fork. This species is restricted to the Black Warrior River system where the species is common but localized. The species is considered to be currently stable, but threats include habitat alteration and modification due to development and impoundments.

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Darters, continued.

Rush darter has been collected in the Clear Creek system in Bankhead National Forest. Collection sites are characterized as relatively low gradient, small streams with sand substrate and burrweed beds. There are three small known populations of this species. This species is uncommon and vulnerable to habitat alteration and decreases in water quality.

Tuscumbia darter is found in limestone spring ponds and runs with aquatic vegetation present. Tuscumbia darter has a narrow range in springs along the Tennessee River in Alabama. Populations are vulnerable to land use changes. Other threats include siltation, changes in the water table, predation, and loss of aquatic vegetation. This species is especially sensitive to changes in physical habitat, such as temperature or turbidity.

The longhead darter, also known as the warrior bridled darter, is known only from the upper Sipsey Fork of the Black Warrior River, where abundance is low. It has been collected within the Bankhead National Forest in the Sipsey Fork. This darter is currently only known from a 10 mile stretch of the Sipsey Fork. This population is believed to be stable. Current threats are reported to be sedimentation from logging and road construction by the timber industry. Implementation of riparian zone protection should reduce threats from logging practices. Additionally, the large amount of truck traffic crossing bridges over the Sipsey Fork present a potential threat in the form of an accidental spill of fuel or hazardous substances.

These species are not expected to exist within the proposed project areas. No fish were encountered during field surveys as perennial streams are not present within the project areas. Mitigation measures are in place to preclude sedimentation of streams and no soil disturbance is anticipated with the project.

#### **BLACK WARRIOR WATERDOG**

The Black Warrior waterdog is an aquatic salamander that is known to occur in the Lower and Upper Sipsey Fork and Lower and Upper Brushy watersheds in the Bankhead. Optimal habitat is described as free-flowing large streams or small rivers with forested streamside zones. Detectable flow and leaf packs within streams are required. Other factors contributing to habitat quality include a low silt load and substrate deposits, low nutrient content and bacterial counts, moderate temperatures, and minimal overall chemical pollution. This salamander is currently known from 10 locations; the populations are highly fragmented; the population densities are low; and the habitat conditions are degraded in general. Habitat degradation and fragmentation are threats to this species.

This waterdog is not expected to exist within the proposed project areas. It was not encountered during field surveys as perennial streams are not present within the project areas. Mitigation measures are in place to preclude sedimentation of streams and no soil disturbance is anticipated with the project.

#### **EVALUATED SPECIES SURVEY INFORMATION**

Although all species that potentially may occur on the Bankhead National Forest were considered, those with actual or potential habitat within the project areas were evaluated. The following species were evaluated in this BE; Eggert's sunflower, sweet pinesap, clammy locust, Diana fritillary, White-fringless orchid, and Rafinesque's big-eared bat.

Sweet pinesap and clammy locust have been documented on the BNF. Scott Gunn recorded two locations of sweet pinesap in his 1990 report "Sensitive Plants of the Bankhead National Forest." Subsequent surveys for sweet pinesap by The Nature Conservancy and Forest Service have not recorded additional locations on the BNF. Clammy locust

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has been recorded in one location on the BNF by Dr. Jimmy Huntley during his 2000 – 2001 southern pine beetle epidemic surveys.

Some adjacent sites were surveyed as part of the forest Health and Restoration Project by Dr. Jimmy Huntley in 2002 and 2003 and by Dr. Wayne Barger in 2003. During that effort the following FS management compartments/stands were surveyed: C-34/s-5,14, 22 and C-33/s-3,19,10, 23. The surveyors found these sites to have slightly acidic soils, mostly composed of pines and mixed stands, variable slopes and no plants, rare communities or other biological interests or concerns. The areas along streams in at least 2 stands were noted as having high plant diversity and of possible biological interest, but no protected species were noted.

Site specific surveys were conducted by District Wildlife Biologist Tom Counts and Biological Science Technician Allison Cochran for this project. Survey dates for these stands were in June and July of 2005. Surveys noted the presence of wetlands within 2 stands. These areas will be protected from heavy machinery by establishment of an exclusion zone in the contract.

Some of these and adjacent sites are within prescribed burn units and have received additional surveys by Counts and Cochran for prescribed burning projects in 2001, 2002, 2003, 2004 and 2005.

Field survey methods included walking over the project sites searching for listed plants and animals, as well as suitable habitat.

No species listed as threatened or endangered by the FWS or as sensitive by the Regional Forester were encountered during field surveys. The only rare communities found during the surveys of these sites were the wetlands, as previously noted.

The following species were considered and identified as having potential habitat within the action area or potentially being affected by the action and were included for further evaluation.

**ENVIRONMENTAL BASELINE FOR THE SPECIES EVALUATED IN THIS BE  
And EFFECTS OF PROPOSED MANAGEMENT ACTION ON EACH SPECIES EVALUATED**

**Eggert's sunflower.**

**Environmental Baseline**

This sunflower is known only from the Interior Low Plateaus of Kentucky, Tennessee, and Alabama. This sunflower is found growing in colonies in open oak/pine woodlands, grassy openings and barrens with shallow soils (barrens/woodland ecosystem). Habitat has been described as rocky hills, barrens or open upland oak-pine woods. It is believed to be an early successional species that is shade-intolerant. It is also reported that this sunflower requires disturbance, such as fire, for germination and habitat maintenance. The habitat it is known from is described as a barrens/woodland ecosystem that is maintained by fire and drought. This habitat type was presumably more widespread when fire and free-roaming grazing animals were more common on the landscape.

In the southeast, large areas open stands of trees and abundant stands of native grasses and flowering herbaceous plants are no longer common. This community persists on roadsides and recently disturbed areas.

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**Eggert's sunflower, continued**

This plant has not been encountered on the Bankhead National Forest, but suitable habitat exists. Although, this species is not listed as occurring in Winston County by the Fish and Wildlife Service. In Alabama, this species has been recorded in Winston County, within a mile of the Bankhead National Forest administrative boundary, in open ridgetop oak savannahs.

Across its range, most of this plant's natural habitat has been converted to cropland or pasture or developed as residential or commercial sites. This species is found in disturbed areas such as road rights-of-ways. In these locations, the plants present may be threatened by road maintenance activities. Other known habitat is currently threatened by weedy and woody succession.

Habitat is not currently available for this plant within any of the project sites or adjacent areas although it could be in the future.

**Direct, Indirect and Cumulative Effects**

A detrimental impact to the species is not expected or anticipated due to the fact that the plant has not been encountered on the forest. Direct effects to this species have been minimized by conducting pre-project field surveys. This species was not encountered within the project areas; therefore, there will not be direct effects. Indirect and cumulative effects include the potential for increasing the available habitat on the forest over the long term. These effects will not be on individuals, but are effects on the amount of available habitat. The indirect effects may be realized at the individual project sites. The cumulative effects may be realized across the forest landscape. When considering these project sites in conjunction with additional sites identified for restoration to upland woodland communities through the Forest Health and Restoration Project (roughly 6000 acres), the cumulative effects of restoring potential habitat for woodland species, including Eggert's sunflower, will be beneficial.

**Determination of Effect**

The proposed project will have no effect on Eggert's sunflower.

**MONKEY-FACE ORCHID (White Fringeless Orchid)**

**Environmental Baseline**

Habitat for this orchid is generally described as 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 Cinnamon fern, chain fern and/or New York fern. Soils are permanently moist, but are not often flooded.

This species of limited distribution is threatened by land-use conversion, habitat fragmentation, succession, pollution, and to a lesser degree by forest management practices according to Nature Serve.

**Potential Management Effects and Determination**

This species has been encountered in one location on the Bankhead.

Habitat for this orchid is potentially present within the wetland sites which are adjacent to at least 2 project areas. The habitat of record for this plant is apparently associated with streams and hillside seeps. This is somewhat different from the gumpond type wetlands found within and adjacent to two treatment sites. Although the habitat is somewhat different than that described for this species, there are some similarities. The wetlands found during field surveys

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were excluded from treatment in this project by marking exclusion zones for heavy equipment. Exclusion zones are also recorded in the contract and will be monitored by BNF Wildlife Staff. There will be no equipment use or activity in wetland areas. This will protect any potential habitat for this plant.

Due to these project mitigations, there will be no impact on white-fringeless orchid.

## **SWEET PINESAP**

### **Environmental Baseline**

This small saprophytic plant is often found in dry sandy (acidic) woods, and is usually found in pine and mixed pine/hardwood stands. It is most often found under pines, giving rise to the common name. It has been reported as being saprophytic on pine roots, and the bases of pine trees. It has also been reported to occur in mixed deciduous hardwood pine stands. It occurs in the south in the mountain foothills and piedmont areas. Given the community association of occurrence, the sweet pinesap should be a fire tolerant, if not fire dependent species. The community type, in addition to a frequent fire regime, historically tended to a more open canopy, with occasional gap dynamics creating openings in the canopy cover.

All project sites provide potential habitat for sweet pinesap as they are upland pine and mixed pine/hardwood stands. None of this potential habitat within the project sites is currently occupied by sweet pinesap as far as detectible populations.

Sweet pinesap has a limited distribution and is rare throughout its range. Loss of forested habitat is a threat to this species.

### **Potential Management Effects and Determination**

No plants were observed in any of the project areas. Actions associated with this project will not be detrimental to sweet pinesap because it is been found to be present. This is a very rare plant. The proposed project may benefit sweet pinesap in the long term by restoring the pine woodland community it is associated with.

The project will have no impact on sweet pinesap.

## **CLAMMY LOCUST**

### **Environmental Baseline**

Clammy locust is known from the eastern United States and Europe. The shrub is probably native only to the mountains of western North Carolina and Tennessee, and perhaps southern Virginia, Georgia, and Alabama. It has been introduced in other parts of the country. This shrub has been observed growing in rocky woods in Winston County. Other habitat descriptions include thin woods, open places, ridgetops, dry rocky mountain longleaf pine forests, and open woodland or savannah settings. Clammy locust occurs on dry sandy soils, rocky slopes, and around small drainheads. It is shade tolerant to some degree.

It is reported to be present in a wildlife opening on Bankhead National Forest. Dr. Jimmy Huntley confirmed the presence of clammy locust in the wildlife opening. No other locations of this species are known on the Bankhead National Forest.

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Lack of disturbance leading to succession and unknown causes of decline are moderate threats to this species.

**Potential Management Effects and Determination**

No plants were observed in any of the project areas. Actions associated with this project will not be detrimental to clammy locust because it is not present. Management activities used to achieve woodland restoration should improve habitat conditions for clammy locust and other woodland species.

The project will have no impact on clammy locust.

**DIANA FRITILLARY**

**Environmental Baseline**

This butterfly is described as a woodland species that is associated with stream habitat and riparian areas. The species uses a variety of habitat components including hardwood woodlands and mixed pine/hardwood woodlands and forests. Breeding habitats are generally described as mesic forests such as cove forests and sometimes bottomland areas. Adults also use adjacent fields, pastures, shrublands and grasslands for nectar.

This species is somewhat common in the mountains in a small area from southwestern Virginia to the Great Smokies region and rare and sporadic elsewhere. Forest Service records do not indicate this species presence on the Bankhead. Diana fritillary has the potential to occur on Bankhead National Forest. A host species for this insect is the violet. Currently, gypsy moth spraying is the largest threat to this species throughout the range. Other threats to this species include habitat loss and habitat fragmentation.

According to Nature Serve, there are no useful estimates of numbers of this species to address global abundance. There are documented records of this species from other parts of Alabama but it is not known from Bankhead, so there are no estimates of population size to address local abundance.

**Potential Management Effects and Determination**

Treatment of midstory and understory shrubs and trees will not directly impact Diana fritillary. The host plant for this species (violets) are not targeted for treatment. Potential breeding habitat along streams will not be disturbed or impacted by this project. These areas are not within the project area.

Over the long term, woodland restoration projects across the BNF such as this one may benefit Diana fritillary and other woodlands associates.

There will be no impact to Diana fritillary from the proposed project.

**RAFINESQUE'S BIG-EARED BAT**

**Environmental Baseline**

This mammal uses abandoned, dilapidated buildings and large hollow trees in or near wooded areas as sites for nursery colonies and summer roosts. According to E. D. Pierson, this species may form roosts under loose sloughing bark of dead and dying trees, in addition to roosts formed in tree cavities (1998). This bat may roost singly, in small clusters, or in large groups of up to 100 or more individuals. Bridges have been shown to be important day-roost sites in some areas. Summer roosts may also occur in the twilight zone of caves and mines.

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Winter roosts include old mines, caves, cave entrances, cisterns and wells in the northern part of its range. According to Best et al., this species usually is not found hibernating in caves in the southern part of its range (1999). In Kentucky, shallow caves or rock shelters in sandstone formations of the Cumberland Plateau are used.

Foraging habitat for this bat has been described as primarily mature forests in both upland and lowland areas. Rafinesque's big-eared bat is reported to forage in brushy communities, mature bottomland hardwood, swamp forests, and 3 to 5 year old pine plantations in a study of the Savannah River Site (Menzel et. al. 2003).

Despite records of large number of occurrences of this species throughout its range, it has never been considered abundant. This bat roosts in small numbers at scattered locations. It is known or suspected to be declining in more than half of the states within its range. In most other states, data are unavailable to determine population trends. The range of this species approximates the historical range of the great cypress swamps, indicating that it may have relied on these sites for roosting and foraging (Bat Conservation International 2001).

This species is very intolerant of disturbance and may abandon roost sites or hibernation sites if disturbed. Threats to Rafinesque's big-eared bat include forest destruction, hollow tree removal during forest management, decreasing availability of abandoned buildings, possibly insecticides, vandalism of caves and mines, and closing or blasting of mines.

### **Potential Management Effects and Determination**

Rafinesque's big-eared bat has never been documented on Bankhead National Forest, although potential habitat is present.

Roost sites will not be disturbed by this project as only very small diameter trees will be disturbed. Rock shelters, bridges, buildings, cisterns, wells, or caves are not present within the treatment areas, nor will they be directly or indirectly impacted by the project. Trees that provide potential roost habitat including mature trees in the overstory, den trees and snags have been identified and will not be impacted by this project. Potential foraging habitat, described as mature forests, is present within all project sites.

There will be no impact to Rafinesque's big-eared bat.

### **DETERMINATION OF EFFECT – *Federally Listed Species (Threatened and Endangered)***

The proposed activity will have "no effect" on Indiana and gray bats, bald eagle, red-cockaded woodpecker, leafy prairie clover, lyrate bladder-pod, Mohr's Barbara's buttons, Alabama streak-sorus fern and Tennessee yellow-eyed grass. The rationale for this finding is that the proposed project does not intersect with potential habitat for these species, thus there is no opportunity for the proposed project to affect the species in a direct, indirect or cumulative manner.

The proposed activity will have "no effect" on flattened musk turtle, the twelve listed species of mussels, and Kral's water plantain. The rationale for this finding is that the proposed project will not intersect streams or riparian habitats and will not result in a change to water quality or sediment delivery to streams based on Forest Plan standards and erosion control measures.

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The proposed activity will have “no effect” on Eggert’s sunflower. The rationale for this finding is that there will be no direct, indirect, or cumulative impacts to the plant, as it is not known to occur on the BNF and has not been encountered on the project sites. However, there may be beneficial indirect and cumulative effects on potential habitat from restoring woodland communities on the Bankhead.

**Summary of Findings for Federally Listed Species**

Scientific Name	Common Name	Status	Finding
<i>Myotis grisescens</i>	Gray Bat	E	No effect
<i>Myotis sodalis</i>	Indiana bat	E	No effect
<i>Haliaeetus leucocephalus</i>	Bald Eagle	T	No effect
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	No effect
<i>Sternotherus depressus</i>	Flattened musk turtle	T	No effect
<i>Epioblasma brevidens</i>	Cumberlandian combshell	E	No effect
<i>Epioblasma metastriata</i>	Upland combshell	E	No effect
<i>Epioblasma turgidula</i>	Turgid blossom pearly mussel	E	No effect
<i>Lampsilis atilis</i>	Fine-lined pocketbook	E	No effect
<i>Lampsilis perovalis</i>	Orange-nacre mucket	T	No effect
<i>Medionidus acutissimus</i>	Alabama moccasinshell	T	No effect
<i>Medionidus parvulus</i>	Coosa moccasinshell	E	No effect
<i>Pleurobema furvum</i>	Dark pigtoe	E	No effect
<i>Pleurobema perovatum</i>	Ovate clubshell	E	No effect
<i>Pleurobema plenum</i>	Rough pigtoe	E	No effect
<i>Ptychobranthus greeni</i>	Triangular kidneyshell	E	No effect
<i>Lampsilis orbiculata (L. abrupta)</i>	Pink mucket pearly mussel	E	No effect
<i>Dalea foliosa</i>	Leafy prairie clover	E	No effect
<i>Helianthus eggertii</i>	Eggert's sunflower	T	No effect
<i>Lesquerella lyrata</i>	Lyrate bladder-pod	T	No effect
<i>Marshallia mohrii</i>	Mohr's Barbara's Buttons	T	No effect
<i>Sagittaria secundifolia</i>	Kral's water-plantain	T	No effect
<i>Thelypteris pilosa var al.</i>	Alabama streak-sorus fern	T	No effect
<i>Xyris tennesseensis</i>	Tennessee yellow-eyed grass	E	No effect

<sup>1</sup>E = endangered; T = threatened

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**Determinations and the Needed Follow-up Actions:** The determination of effects for Federally Listed Species are: 1) No Effect; 2) Is not likely to adversely affect; 3) Is likely to adversely affect. All the possible effects can and should be included within one of the above determinations. The needed follow-up actions vary depending on the type of species and the determination.

A “**no effect**” determination should be used when the proposed actions have no effects on the PETS species or critical habitat. No follow-up action is required for this determination.

A determination of “**is not likely to adversely affect**” should be used for discountable, insignificant or beneficial effects. If the determination of “is not likely to adversely affect”, written concurrence is required from the FWS for both proposed and listed species.

*Discountable* effects are those extremely unlikely to occur. Based upon best judgment, a person would not be able to meaningfully measure, detect or evaluate insignificant effects.

*Insignificant* effects relate in size of the impact and should never reach the scale where take occurs.

*Beneficial* effects are positive effects without any adverse effect to the species.

A determination of “**is likely to adversely affect**” should be used if any adverse effect to a listed species may occur as a direct or indirect result of the proposed action. If the determination is “likely to adversely affect” and the species is proposed for listing, concurrence with the FWS is required. If the determination of “is likely to adversely affect” and the species is listed as threatened or endangered, formal consultation with the FWS is required by ESA section 7. Concurrence is a legally required “informal consultation” with the FWS. All requests for formal consultation must be sent through the Regional Forester. If applicable, Region or Forest-wide concurrence letters from the FWS can be referenced for site-specific projects.

Consultation Implications: Based on the finding of “no effect” for all federally listed species, additional concurrence from the FWS is not required.

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**DETERMINATION OF EFFECT – *Forest Service Sensitive Species***

Some species are of concern although not listed as threatened or endangered by the FWS. They have been ranked Globally as G1, G2 or G3 by the Natural Heritage Network of The Nature Conservancy, which means viability concerns throughout their entire range. This may be due to habitat requirements, range limits or particular vulnerability to activities. These species have been listed by the Regional Forester as Sensitive and require special consideration in order to ensure that viability is not impaired and to preclude any trend toward the necessity of their being proposed for listing as threatened or endangered by the FWS. According to the Natural Heritage Network rankings, G1 species are critically imperiled globally because of extreme rarity (typically less than 6 occurrences, less than 1,000 individuals or very few remaining acres) or because of some factor(s) making them especially vulnerable to extinction. Species ranked G2 are imperiled globally because of extreme rarity (typically 6-20 occurrences, 1,000 to 3,000 individuals or few remaining acres) or because of some factor(s) making them very vulnerable to extinction. Species ranked as G3 are rare or uncommon (typically 21-100 occurrences or 3,000 to 10,000 individuals) throughout its range; or found locally, even abundantly, in a restricted range (e.g. in a single state or physiographic region); or vulnerable to extinction throughout its range because of specific factors. Rankings begin with a T instead of a G are used for subspecies and two rankings together, such as G2G3, indicates uncertainty in the ranking of that species. A question mark (?) indicates some doubt concerning the status of the species or subspecies. Rankings preceded by an S indicate the status inside the state of Alabama as determined by the Alabama Natural Heritage Program. The list of plant and animal species is based upon the Southern Region Sensitive Species, revision August 7, 2001.

The determination is “no impact” for the sensitive species of plants, bryophytes and wildlife. The rationale for this finding is that these species or their habitat are not present on the project sites and will not be impacted by the proposed project.

**Forest Service Sensitive Species of the Bankhead National Forest**

Scientific Name	Common Name	Status <sup>1</sup>	Finding
<i>Aesculus parviflora</i>	Small flowered buckeye	S	No impact
<i>Astragalus tennesseensis</i>	Tennessee Milkvetch	S	No impact
<i>Aureolaria patula</i>	Spreading yellow false foxglove	S	No impact
<i>Carex brysonii</i>	Bryson's sedge	S	No impact
<i>Delphinium alabamicum</i>	Alabama larkspur	S	No impact
<i>Diervilla rivularis</i>	Riverbank bush-honeysuckle	S	No impact
<i>Hymenophyllum tayloriae</i>	Gorge filmy fern	S	No impact
<i>Jamesianthus alabamensis</i>	Alabama jamesianthus	S	No impact
<i>Juglans cinerea</i>	Butternut	S	No impact
<i>Leavenworthia alabamica</i> <i>var. alabamica</i>	Alabama Gladecress	S	No impact
<i>Leavenworthia crassa</i>	Fleshyfruit Gladecress	C&S	No impact
<i>Lesquerella densipila</i>	Duck River Bladderpod	S	No impact
<i>Monotropsis odorata</i>	Sweet pinesap	S	No impact
<i>Asplenium x ebenoides</i>	Scott's Spleenwort	S	No impact
<i>Marshallia trinervia</i>	Broadleaf Barbara's buttons	S	No impact
<i>Minuartia alabamensis</i>	Alabama Sandwort	S	No impact

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<i>Neviusia alabamensis</i>	Alabama snow-wreath	S	No impact
<i>Platanthera intergrilabia</i>	White fringeless orchid	C&S	No impact
<i>Polymnia laevigata</i>	Tennessee Leafcup	S	No impact
<i>Robinia viscosa</i>	Clammy Locust	S	No impact
<i>Rudbeckia triloba var pinnatiloba</i>	Pinnate-lobed Black-eyed Susan	S	No impact
<i>Scutellaria alabamensis</i>	Alabama skullcap	S	No impact
<i>Sedum nevii</i>	Nevius' stonecrop	S	No impact
<i>Silene ovata</i>	Blue Ridge catchfly	S	No impact
<i>Talinum calcaricum</i>	Limestone Fameflower	S	No impact
<i>Talinum mengesii</i>	Menge's fameflower	S	No impact
<i>Thalictrum mirabile</i>	Little mountain meadow rue	S	No impact
<i>Trillium lancifolium</i>	Lanceleaf Trillium	S	No impact
<i>Trillium simile</i>	Jeweled Trillium	S	No impact
<i>Speyeria diana</i>	Diana Fritillary	S	No impact
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared bat	S	No impact
<i>Cheilolejeunea evansii</i>	A liverwort	S	No impact
<i>Aneura maxima</i>	A liverwort	S	No impact
<i>Pellia X appalachiana</i>	A liverwort	S	No impact
<i>Nardia lescurii</i>	A liverwort	S	No impact
<i>Plagiochila echinata</i>	A liverwort	S	No impact
<i>Radula sullivantii</i>	A liverwort	S	No impact
<i>Riccardia jugata</i>	A liverwort	S	No impact
<i>Hydroptila paralatosa</i>	A caddisfly	S	No impact
<i>Rhyacophila carolae</i>	A caddisfly	S	No impact
<i>Elliptio arca</i>	Alabama spike	S	No impact
<i>Obovaria jacksoniana</i>	Southern Hickorynut	S	No impact
<i>Obovaria unicolor</i>	Alabama Hickorynut	S	No impact
<i>Strophitus subvexus</i>	Southern creekmussel	S	No impact
<i>Villosa nebulosa</i>	Alabama rainbow	S	No impact
<i>Etheostoma bellator</i>	Warrior darter	S	No impact
<i>Etheostoma douglasi</i>	Tuskaloosa darter	S	No impact
<i>Etheostoma phytophyllum</i>	Rush darter	S	No impact
<i>Etheostoma tuscumbia</i>	Tuscumbia darter	S	No impact
<i>Percina sp.cf.macrocephala</i>	Longhead darter (Warrior Brinled Darter)	S	No impact
<i>Necturus alabamensis</i>	Black Warrior waterdog	S	No impact

<sup>1</sup>S = sensitive; C = candidate for Federal listing

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**Determinations and the Needed Follow-up Actions:** Possible Determinations and the Needed Follow-up Actions –  
The four possible determinations of effects are:

1. “no impact”,
2. “beneficial impact”,
3. “may impact individuals, but not likely to cause a trend to federal listing or loss of viability”,
4. “likely to result in a trend to federal listing or a loss of viability”.

All the possible effects of a proposed action should be included under one of the above determinations. There is no need to consult with the FWS for sensitive species. No action, other than documenting the rationale, is required for determination of “no impact”, “beneficial impact” or “may impact individuals, but not likely to cause a trend to federal listing or a loss of viability”. If the determination is “likely to result in a trend to federal listing or a loss of viability”, the proposed action should be modified to avoid, minimize or rectify the impact.

Consultation implications: Consultation with the FWS is not required for Forest Service sensitive species.

## MITIGATION MEASURES

Specific mitigation measures for this project are not required. Field surveys did not reveal the presence of any listed plants or animals on or immediately adjacent to the project sites. Exclusion zones were established around the wetlands as noted to provide protection for any species not observed during field surveys.

## PREPARERS

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District Biological Science Technician	District Wildlife Biologist
Bankhead Ranger District	Bankhead Ranger District

Biological Evaluation Completed by: \_\_\_\_\_/s/ Tom Counts\_\_\_\_\_

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On: \_August 1, 2005  
Date

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**REFERENCES AND DATA SOURCES**

- Bailey, M.A. 1992. *Final Report of the Black Warrior Waterdog Status Survey*. Project E-1 Alabama Natural Heritage Program, Montgomery, Alabama.
- Biomonitoring in the Mulberry Fork Watershed, 1999-2001. 2001. Thomas E. Shepard, Patrick E. O'Neil, Stuart W. McGregor, and Wiley P. Henderson. Geological Survey of Alabama, Environmental Geology Division. Tuscaloosa, Alabama. 60 pp.
- Case, F.W. and R.B. Case. 1997. *Trilliums*. Timber Press. Portland, Oregon. 285 pps.
- Dean, B.E., A. Mason, and J.L. Thomas. 1973. *Wildflowers of Alabama and Adjoining States*. The University of Alabama Press. Tuscaloosa, Alabama. 230 pp.
- Dean, B.E., and A. Mason. 1968. *Trees and Shrubs in the Heart of Dixie*. Southern University Press. Birmingham, Alabama. 246 pps.
- Demography and Habitat Requirements of the Black Warrior Waterdog, *Necturus alabamensis*. 2001. Michelle Durflinger, Auburn University. Master's Thesis, Auburn University. 55 pp.
- Florence, S. *Biological Evaluation: Suppression of the Southern Pine Beetle Infestation On the Nantahala and Pisgah National Forests*. Grandfather Ranger District, Nebo, North Carolina.
- Harris, S.C., P.E. O'Neil, and P.K. Lago. 1991. *Caddisflies of Alabama*. Geological Survey of Alabama, Biological Resources Division. Tuscaloosa, Alabama. 442 pps.
- Hartfield, P. D. 1990. *Status survey for Mussels in the Tributaries of the Black Warrior River, Alabama*. USDI, US Fish & Wildlife Service.
- Harvey, M.J., J.S. Altenbach, and T.L. Best. 1999. *Bats of the United States*. Arkansas Game and Fish Commission. 63 pp.
- Huntley, J. C. 1995. *Biological Evaluation for Amendment Number 14, New SMZ Standards to National Forests in Alabama Land and Resource Management Plan*. USDA Forest Service. 22 pp.
- Lein, G. M. 1999. *An inventory of freshwater mussels and the flattened musk turtle (Sternotherus depressus) in selected streams of William B. Bankhead National Forest, Winston County, Alabama*. Challenge Cost Share Agreement #01-CCS-98-006 between USDA Forest Service, National Forests in Alabama and Alabama Department of Conservation and Natural Resources, State Lands Division, Natural Heritage Section.
- Lellinger, D.B. 1985. *A Field Manual of the Ferns and Fern-Allies of the United States and Canada*. Smithsonian Institution Press. Washington, D.C. 389 pp.
- McGregor, S.W. 1992. *A Mussel Survey of the Streams Draining Bankhead National Forest and the Oakmulgee Division of the Talladega National Forest, Alabama*. Geological Survey of Alabama. Tuscaloosa, Alabama. 29 pp.

Biological Assessment/Evaluation  
Upper Brushy Stewardship – Mid Story Removal

- Menzel, M.A., J.M. Menzel, T.C. Carter, W.M. Ford, J.W. Edwards. 2001. Review of the Forest Habitat Relationships of the Indiana Bat (*Myotis sodalis*). USDA Forest Service, Northeastern Research Station General Technical Report NE-284. Newtown Square, Pennsylvania. 21 pp.
- Mettee, M.F., P.E. O'Neil, and J.M. Pierson. 1996. Fishes of Alabama and the Mobile Basin. Oxmoor House, Birmingham, Alabama.
- Mount, R.H. 1975. The Reptiles and Amphibians of Alabama. University of Alabama Press, Tuscaloosa, Alabama. pp. 306-308.
- Mussels That Matter. US Geological Survey leaflet. USGS, Biological Resources Division. May 1998.
- NatureServe. 2003. NatureServe Explorer: An online encyclopedia of life [web application]. Version 1.8. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>.
- Personal conversations with
- Dr. W.E. Stone, Alabama A & M University, 4900 Meridian Street, Normal, Alabama 35762.
  - Paul Hartfield, USDI, US Fish & Wildlife Service, Threatened and Endangered Species Office, Jackson, Mississippi.
  - Ralph Costa, Red-Cockaded Woodpecker Coordinator, USDI, US Fish & Wildlife Service, Clemson University, Clemson, South Carolina.
  - Dan Spaulding, Curator of Collections, Anniston Museum of Natural History, 800 Museum Drive, Anniston, Alabama.
  - Dr. Robert Kral, Cairo, Georgia.
  - Dr. Merlin Tuttle, Executive Director of Bat Conservation International.
  - Dr. Jimmy Huntley, Louisville, Mississippi.
- Pierson, E.D. 1998. Tall Trees, Deep Holes, and Scarred Landscapes: Conservation Biology of North American Bats. *In* Bat Biology and Conservation, T.H. Kunz and P.A. Racey, eds., Smithsonian Institution, Washington. pp. 309-325.
- Plants of Alabama. NatureServe web page. <http://www.abi.org/nhp/us/al/plants.html>
- Radford, A.E., H.E. Ahles, and C.R. Bell. 1968. Manual of the Vascular Flora of the Carolinas. University of North Carolina Press. Chapel Hill, North Carolina. 1183 pps.
- Rickett, H.M. 1967. Wildflowers of the United States, Volume Two. McGraw-Hill Book Company. New York. 688 pps.

Biological Assessment/Evaluation  
Upper Brushy Stewardship – Mid Story Removal

Schotz, A.R. 2001. Threatened and Endangered Species: Eggert's Sunflower. *Alabama's Treasured Forests*. Fall 2001. 25.

Simon, S.A. 2000. *Biological Evaluation for Regional Forester's Sensitive Species and Locally Rare Species: Nantahala and Pisgah Plan Amendment #10, National Forests in North Carolina*.

Status Survey of the Blueface Darter, *Etheostoma* sp. cf. *E. zonistium*, in upper Sipsey (Mobile Basin) and Bear Creek (Tennessee River Drainage) of Alabama. 2002. Bernard R. Kuhajda and Richard L. Mayden, University of Alabama. Submitted to US Fish and Wildlife Service, Jackson, Mississippi.

The Nature Conservancy, Alabama Natural Heritage Program. 2001. *Alabama Inventory List – The Rare, Threatened and Endangered Plants, Animals and Natural Communities of Alabama*. Montgomery, Alabama.

USDA Forest Service. 1994. Management Standards for Streamside Management Zones. National Forests in Alabama. 8 pp.

USDA Forest Service. 2002. Southern Region Sensitive Species Revision, Forest Service Regional Database. January 2002.

USDA Forest Service. 2003. Final Environmental Impact Statement. Forest Health and Restoration Project. Bankhead National Forest. 351 pp.

USDA Forest Service. 2004. Revised Land and Resource Management Plan. National Forests in Alabama.

USDA Forest Service. 2004. Final Environmental Impact Statement for the Revised Land and Resource Plan. National Forests in Alabama.

USGS, United States Geological Survey. Butterflies of North America, Diana (*Speyeria Diana*). Northern Prairie Wildlife research Center. July 5, 2005. <http://www.npwrc.usgs.gov/resource/distr/lepid/bflyusa/usa/76.htm>

USDI, US Fish & Wildlife Service. 1991. Kral's Water Plantain Recovery Plan. Jackson, Mississippi.

USDI, US Fish & Wildlife Service. 1993. Final Rule: Endangered and Threatened wildlife and Plants; Endangered Status for Eight Freshwater Mussels and Threatened Status for Three Freshwater Mussels in the Mobile River Drainage.

USDI, US Fish & Wildlife Service. 2004. Final Rule: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Three Threatened Mussels and Eight Endangered Mussels in the Mobile River, Final Rule. 50 CFR Part 17. July 2004.

USDI, US Fish & Wildlife Service. 1996. Alabama Streak-Sorus Fern Recovery Plan. Atlanta, Georgia.

USDI, US Fish & Wildlife Service. 1996. Indiana Bat Recovery Plan – Technical Draft. Indiana Bat Recovery Team.

Biological Assessment/Evaluation  
Upper Brushy Stewardship – Mid Story Removal

- USDI, US Fish & Wildlife Service. 2002. Alabama's Federally Listed Species by County as Updated June 2003. Daphne Ecological Services Field Office web page. <http://daphne.fws.gov/es/specieslst.htm>
- USDI, US Fish & Wildlife Service. Species Profile for federally listed clams. U.S. Fish and Wildlife Service Division of Endangered Species homepage. [http://ecos.fws.gov/species\\_profile/species\\_profile.html](http://ecos.fws.gov/species_profile/species_profile.html)
- USDI, US Fish & Wildlife Service. Species Profile for federally listed plants. U.S. Fish and Wildlife Service Threatened and Endangered Species homepage. <http://endangered.fws.gov/i/q.html>
- USDI, US Fish and Wildlife Service. 1994. Recovery Plan for Tennessee Yellow-eyed Grass (*Xyris tennesseensis* Kral). US Fish and Wildlife Service, Jackson, Mississippi. 24 pp.
- USDI, US Fish and Wildlife Service. 1996. Leafy Prairie-clover Recovery Plan. US Fish and Wildlife Service, Atlanta, Georgia. 74 pp.
- USDI, US Fish and Wildlife Service. 1996. Recovery Plan for the Lyrate Bladderpod (*Lesquerella lyrata* Rollins). US Fish and Wildlife Service, Atlanta, Georgia. 27 pp.
- USDI, US Fish and Wildlife Service. 1998. Technical/Agency Draft Recovery Plan for *Helianthus eggertii* Small (Eggert's Sunflower). Atlanta, Georgia. 32 pp.
- USDI, US Fish and Wildlife Service. 2000. Mobile River Basin Aquatic Ecosystem Recovery Plan. Atlanta, Georgia. 128 pp.
- Wilson, L.A. 1995. The Land Manager's Guide to the Amphibians and Reptiles of the South. The Nature Conservancy, Southeastern Region. Chapel Hill, North Carolina. 360 pp.
- Wilson, L.M. 1999. Biological Opinion on Impacts of Forest Management Activities to Indiana and Gray Bats on the National Forests in Alabama. USDI, US Fish & Wildlife Service. Ecological Services Field Office, Daphne, Alabama.

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Errata

BIOLOGICAL EVALUATION OF PROPOSED, ENDANGERED, THREATENED  
& SENSITIVE SPECIES

for

MIDSTORY REMOVAL in  
BANKHEAD NATIONAL FOREST  
Upper Brushy Stewardship Project Area

**Eggert's sunflower determination**

On August 18, 2005, the US Fish and Wildlife Service published its Final Rule removing Eggert's Sunflower from the federal list of Threatened and Endangered plant species. The BE considered and made a "no effect" determination for this species based on field surveys performed. The analysis of and determination made for a species subsequently de-listed has no relevance to adequacy of the BE.

/s/ *Allison Cochran*

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1/18/06

Date