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Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans

Arizona and New Mexico



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Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans

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Abstract: The Forest Service, Southwestern Region, has prepared this “Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico” (FSFEIS) to disclose, review, and assess scientific arguments challenging the Agency’s conclusions over the northern goshawk’s habitat preferences. The supplement will update the final environmental impact statement (FEIS) which amended the 11 forest plans in the region for northern goshawk, Mexican spotted owl, and old-growth standards and guidelines in June 1996.

This supplement to the FEIS has been prepared in accordance with an opinion filed November 18, 2003, by the Ninth Circuit Court of Appeals (CV-00-01711-RCB) which held that the FEIS failed to disclose responsible scientific opposition that was addressed in the project record. The original Notice of Intent for this plan amendment was published in the Federal Register on June 24, 1992 (57 FR 28171).

This supplement addresses the issue of scientific arguments over the northern goshawk’s habitat preference and updates the “FEIS for Amendment of National Forest Management Plans in the Southwestern Region.” The FEIS includes guidelines for management of habitat for the Mexican spotted owl and northern goshawk. The FEIS was noticed for availability in the Federal Register on November 3, 1995 (60 FR 55841). The Record of Decision was signed June 5, 1996. Copies of the Final EIS and Record of Decision are available on the World Wide Web at <http://www.fs.fed.us/r3/projects/index.shtml>.

Summary

The Forest Service, Southwestern Region, has prepared this “Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico” to disclose, review, and assess scientific arguments challenging the Agency’s conclusions over the northern goshawk’s habitat preferences. This supplement updates the final environmental impact statement (FEIS) which amended the 11 forest plans in the region for northern goshawk, Mexican spotted owl, and old-growth standards and guidelines in June 1996. The FEIS includes guidelines for management of habitat for the Mexican spotted owl and northern goshawk. The original Notice of Intent to prepare an environmental impact statement (NOI) for the plan amendment was published in the Federal Register on June 24, 1992 (57 FR 28171). The FEIS was noticed for availability in the Federal Register on November 3, 1995 (60 FR 55841). The Record of Decision was signed June 5, 1996.

This supplement to the FEIS was prepared in accordance with an opinion filed November 18, 2003, by the Ninth Circuit Court of Appeals (CV-00-01711-RCB) which held that the FEIS failed to disclose responsible scientific opposition that was addressed in the project record. This supplement to the FEIS addresses the issue of scientific arguments over the northern goshawk’s habitat preference and updates the “FEIS for Amendment of National Forest Management Plans” in the Southwestern Region.

Background

Based on concerns over the viability of the northern goshawk in the Southwestern United States, the USDA Forest Service (Forest Service) Regional Forester for the Southwestern Region (Arizona and New Mexico) created the Northern Goshawk Scientific Committee to review habitat management needs for the species.

In August 1992, the Northern Goshawk Scientific Committee published General Technical Report RM-217, “Management Recommendations for the Northern Goshawk in the Southwestern United States.” This report concluded that the northern goshawk occupied a mosaic of forest types, forest ages, structural conditions, and successional stages in their daily foraging movements throughout the Southwest’s deciduous and mixed conifer forests. The report then set forth recommendations describing the desired balance of forest age classes or vegetation structural stages (VSS) for the nest area, post-fledging area, and foraging area of the goshawk’s range in the Southwestern United States.

Previous to release of the technical report, on June 24, 1992, the Forest Service published a Notice of Intent to prepare an environmental impact statement amending forest land and resource management plans (forest plans) in the Southwestern Region to incorporate guidelines for habitat management of the northern goshawk.

Following a request for public comment, the Forest Service received comments and letters from the Arizona Game and Fish Department, New Mexico Department of Game and Fish, and U.S. Fish and Wildlife Service, among others. The Arizona Game and Fish Department submitted a letter and accompanying report titled, “Arizona Game and Fish Department Review of U.S. Forest Service Strategy for Managing Northern Goshawk Habitat in the Southwestern United States.” This report presented a differing conclusion over the habitat preferences of the northern goshawk than that presented in General Technical Report RM-217.

Summary

Much correspondence over the Forest Service's General Technical Report RM-217 and the Arizona Game and Fish Department's letter and accompanying report ensued between the Forest Service and Federal and state game management agencies. In addition, on June 15, 1994, the Forest Service completed the "Goshawk Opinion Paper: A Response to Arizona Game and Fish Department Review of U.S. Forest Service Strategy for Managing Northern Goshawk Habitat in the Southwestern United States."

Partially in response to public and Agency comment, the Forest Service created an interagency team, the Goshawk Interagency Implementation Team, to discuss implementation of General Technical Report RM-217 recommendations, as well as identify concerns raised by, and propose revisions to, those recommendations.

In August 1994, the Forest Service issued the "Draft Environmental Impact Statement for Amendment of Forest Plans" (DEIS) which displayed and analyzed environmental impacts of alternative approaches to amending the region's forest plans. Within its range of alternatives, the DEIS proposed an alternative consistent with the recommendations found in General Technical Report RM-217 (Alternative C). It also proposed an alternative (Alternative D) with a range of vegetative structural stages with higher percentages of old-growth percentages than found in Alternative C. Alternative D was patterned after DEIS comments submitted jointly by the Arizona and New Mexico state game agencies. State game agency input depicted in Alternative D is a slight variation of the recommendations developed by the Goshawk Interagency Implementation Team and of information depicted in the report RM-217.

Following its issuance, the Forest Service offered, received, and considered public comments on the DEIS. Wildlife biologist D. C. Crocker-Bedford, the Arizona Game and Fish Department, the New Mexico Department of Game and Fish, and the Center for Biological Diversity, among others, submitted comments to the DEIS. These comments, once again, challenged General Technical Report RM-217's conclusions on the habitat preferences of the northern goshawk. Several of the comment letters cited additional research and scientific studies that were released after publication of General Technical Report RM-217 and supported the position that the northern goshawk preferred vegetative structural conditions with higher proportions of dense canopy mature forests, particularly in the foraging areas.

In October 1995, the Forest Service issued a "Final Environmental Impact Statement for Amendment of Forest Plans" (FEIS). The FEIS included minor changes to Alternatives C and D. Alternative D was revised to include standards and guidelines that reflect verbatim comments submitted by the Arizona Game and Fish Department and the New Mexico Department of Game and Fish resulting in a slight variation from the recommendations developed by the Goshawk Interagency Implementation Team and those detailed in General Technical Report RM-217.

The FEIS also included an alternative that was developed to respond to the Mexican Spotted Owl Recovery Plan (Alternative G). Alternative G included standards and guidelines for the northern goshawk that were developed in early May 1995, and considered all known information from the Goshawk Interagency Implementation Team recommendations, Arizona Game and Fish Department and New Mexico Department of Game and Fish comments, and experience gained during implementation of interim direction.

Following release of the FEIS, the Forest Service provided an opportunity to interested parties to submit comments. On June 5, 1996, the Regional Forester issued the "Record of Decision for

Amendment of Forest Plans: Arizona and New Mexico” (ROD) which selected Alternative G, as detailed in the FEIS, for implementation.

An administrative appeal opportunity was afforded to those individuals and organizations who had been involved in the process. The Southwest Center for Biological Diversity, partnering with the Southwest Forest Alliance and the Forest Conservation Council, filed an administrative appeal on July 23, 1996. Their appeal was one of 13 appeals on the ROD. An appeal point in the Southwest Center for Biological Diversity appeal contended the Forest Service did not consider the best available scientific information. The June 5, 1996, Record of Decision was affirmed on all 13 appeals by the appeal deciding officer for the Chief of the Forest Service.

In 2000, the Center for Biological Diversity filed suit charging the decision did not adequately evaluate opposing viewpoints in the FEIS. In adopting the ROD, the suit alleged the Forest Service failed to maintain the scientific integrity of its NEPA process because the FEIS failed to discuss or analyze reliable and relevant scientific studies describing the northern goshawk’s habitat and foraging needs. Specifically, plaintiffs claimed the FEIS omitted from its review any discussion of at least nine scientific studies and/or reports whose conclusions contradicted the findings and recommendations mentioned in the FEIS.

The District Court granted summary judgment in favor of the Forest Service in a 2001 opinion. On November 18, 2003, the Ninth Circuit Court reversed and remanded the District Court’s opinion stating:

While the Agency is not required to publish each individual comment in the final statement, the regulations clearly state that the Agency must disclose responsible opposing scientific opinion and indicate its response in the text of the final statement itself. The mere presence of the information in the record alone does not cure the deficiency here.

Accordingly, we find that the Final EIS fails to disclose and discuss responsible opposing scientific viewpoints in the final statement itself in violation of NEPA and the implementing regulations.

On October 1, 2004, the Environmental Protection Agency issued a Notice of Availability in the Federal Register (FR 59, 58911) of the Forest Service’s “Draft Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico.” This Notice of Availability initiated a 45-day public comment period on the draft supplement. The comment period ended on November 15, 2004. The Forest Service received a total of 11 comment letters, including additional literature on the northern goshawk.

This “Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico” is intended to remedy the deficiency found by the Ninth Circuit Court of Appeals. That is, disclose, review, and assess alternative points of view and scientific perspectives to those used by the Agency in formulating Alternative G, the preferred alternative.

Summary

Supplemental Pages

This “Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico” contains replacement pages for pages 6 through 9 of Chapter 2 and pages 19 through 23 of Chapter 3.

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**The following pages
replace pages 6 - 9 in the
“Final Environmental Impact Statement
for Amendment of Forest Plans”**

CHAPTER 2 - ALTERNATIVES

A. ALTERNATIVE DEVELOPMENT

A preliminary review of Southwestern Region forest plans was conducted in 1993. The review identified the plan changes that would result from incorporating current Mexican spotted owl and northern goshawk management direction into existing forest plans. The Regional Forester also identified needed changes in the silvicultural emphasis, old-growth allocation and steep slope (40 percent+) logging practices. The review also identified other standards and guidelines in the forest plans that may conflict with the management direction proposed to be added to the forest plans.

A proposed action was developed based on the forest plan review, current management knowledge for the Mexican spotted owl and northern goshawk, and the changes identified by the Regional Forester. A summary of the proposed forest plan changes was developed as a scoping report that was sent to the public for review in late 1993 (see Chapter 5 of this environmental impact statement for more information).

The National Environmental Policy Act requires a "no action" alternative be developed for this environmental impact statement (see Alternative A). Alternative B was described in the scoping report as the initial proposed action. Three additional alternatives were developed in early 1994 based on comments received on the scoping report. Alternative C was developed by modifying Alternative B with the wording and content changes suggested by scoping report commenters. Alternative C was identified in the draft environmental impact statement (DEIS) as the proposed action of the Forest Service. Alternative D was developed from suggestions submitted by the Goshawk Interagency Implementation Team. Alternative E was developed from suggestions submitted by Applied Ecosystems, Inc. Alternative F was based on suggestions by the Apache-Sitgreaves National Forests for an ecosystem approach to vegetation management.

A DEIS was released for comment as documented in a Notice of Availability in the Federal Register on August 19, 1994. The notice identified a formal comment period ending on December 01, 1994 (a total of 104 days). Comments on the DEIS that were submitted late were considered if they were received prior to May 1, 1995 (a total of 151 extra comment period days).

DEIS commenters suggested changes in several of the alternatives. All of the action alternatives depicted in the final EIS are within the range of environmental effects disclosed in the DEIS. The changes made in the FEIS are consistent with the intent of existing regulations (40 CFR 1503.4). A summary of the changes for each alternative follows.

Alternative A was modified to reflect resource management direction in forest plans that existed prior to Forest Service adoption of special interim management guidelines for the Mexican spotted owl and northern goshawk. The public asked for this change to make the "no action" alternative a better baseline for comparison of the true resource and socio-economic impacts from adopting final Mexican spotted owl and northern goshawk guidelines.

Alternative C was separated from Alternative F because comments received stated the presentation in the DEIS of the paired alternatives was confusing. This combined alternative was identified as the Agency's preferred alternative in the DEIS.

Alternative D was adjusted to reflect comments received from the Arizona and New Mexico state game agencies. The northern goshawk standards and guidelines depicted in Appendix E for Alternative D are a verbatim rendition lifted directly from their jointly submitted DEIS comment letter and replace input previously supplied from the Goshawk Interagency Implementation Team. The Mexican spotted owl standards and guidelines were adjusted to reflect information in the Mexican Spotted Owl Recovery Plan.

Alternative E was not changed from draft to final EIS.

Alternative G was added after the draft based on many comments received that the Agency needed to respond to the Mexican Spotted Owl Recovery Plan (MSORP). The MSORP was released for public review in March 1995. A team of Federal scientists, including a Recovery Plan Team member, developed Alternative G standards and guidelines for both birds in early May 1995 (see Chapter 4 for team information). This team translated the MSORP into forest plan standards and guidelines and also developed northern goshawk standards and guidelines considering

existing Forest Service direction, Goshawk Interagency Implementation Team recommendations and the DEIS comment letter submitted by the state game agencies.

Among avian biologists and within the research community there are commonly agreed upon components of goshawk biology, habitat needs, and management direction for management of the northern goshawk. These are the foundation from which goshawk guidelines in the action alternatives are developed. For this reason, action alternatives will have similar approaches to northern goshawk management direction.

The primary difference between the action alternatives is variation in the standards and guidelines related to the foraging areas that will ultimately be included in the amendment of Southwestern Region forest plans. This variation represents differing scientific opinion on the characteristics of foraging areas used by goshawks. Appendix E of this FEIS contains the standards and guidelines applicable to each alternative.

B. ALTERNATIVES DROPPED FROM DETAILED STUDY

The original proposed action (Alternative B) depicted in the scoping report has been dropped from detailed study. The many commenters to the scoping report, both internal and external to the Agency, suggested wording changes that helped clarify the intent of the amendment. The changes are minor and have been incorporated in Alternative C. The expected environmental effects of Alternative B would not be any different than those expected for Alternative C. Alternative C has been carried forward as an alternative discussed in detail.

C. ALTERNATIVES CONSIDERED IN DETAIL

1. Objectives Common to Alternatives: The objectives stated in Chapter 1 of this environmental impact statement for the proposed action are exactly the same for all action alternatives.

2. Alternative Mitigation: This environmental impact statement is a programmatic document. Site-specific mitigation measures have not been described for any of the alternatives. The wording of key standards and guidelines peculiar to each alternative are displayed in Appendix E. The broad, programmatic environmental effects of the

alternatives are predicted based on the standards and guidelines in each alternative. Site specific environmental effects will be analyzed and disclosed during the Southwestern Region's Integrated Resource Management process for individual projects implemented under the umbrella of the amended forest plans.

3. Alternative Descriptions: Six alternatives are displayed in detail in this FEIS. Each of the alternatives represent different ways to incorporate programmatic management guidance into project implementation, a different emphasis on management tools used and/or a different set of specific management direction (e.g., different wording for standards and guidelines). For specific details on how the standards and guidelines would vary by alternative, review Appendix E of this FEIS.

A comparison of the basis for development of each alternative is summarized in Table 1 at the end of this section of the "Final Supplement to the Final Environmental Impact Statement."

Alternative A: Alternative A is the "no action alternative" required by National Environmental Policy Act regulations (40 CFR Part 1502.14(d)). In the context of this programmatic environmental impact statement, Alternative A would continue existing forest plan direction for Mexican spotted owl and northern goshawk management. Formal consultation related to the Mexican spotted owl would be sought on any and all forest management activities deemed to "may affect" the owl. New direction for the two birds would not be added to forest plans until they are revised beginning in 2005 and ending in approximately 2010. Old-growth allocation percents would still vary from forest to forest. Even-aged management would be the emphasized silvicultural tool. The Apache-Sitgreaves, Carson, Coconino, and Kaibab National Forest plans would maintain the existing Mexican spotted owl standard for a 300-acre core area around each occupied nest, even though on-the-ground management would be guided by biological opinions issued by the Fish and Wildlife Service. The Apache-Sitgreaves, Carson, Cibola, Coconino, and Prescott National Forest plans would maintain the existing northern goshawk standard for a 20- to 30-acre core area around occupied nests. The Kaibab would provide eight chain buffers around occupied nests. No other northern goshawk protection would be provided. Steep slope (slopes 40 percent+) harvest solely for timber production

purposes would still be a possible activity on the Apache-Sitgreaves, Gila, Lincoln, and Santa Fe National Forests, but not on any of the other forests.

Alternative C: Alternative C would incorporate Mexican spotted owl and northern goshawk management direction into forest plans through the forest plan amendment process described in National Forest Management Act regulations (36 CFR 219). Old-growth standards and guidelines would be the same for every national forest in the Southwestern Region. The specific areas for old growth allocation (20 percent) within each management area and old-growth block size would be determined during the site-specific Integrated Resource Management analysis conducted for specific projects. In areas where existing old growth was surplus to identified ecosystem needs, the best stands would be allocated to old growth. All existing old growth would be retained in areas where the old-growth age classes were deficit. Additional lands will be allocated and managed for future old growth where needed to meet the 20 percent guideline. Uneven-aged silvicultural practices will be emphasized over other methods. The option of using even-aged silvicultural methods would be determined in the Integrated Resource Management process during the site specific analysis for projects implementing forest plans. Mexican spotted owl guidance would follow the direction stated in Interim Directive 2 plus dispersal habitat considerations. Northern goshawk guidance would be very similar to that which is presented in the report “Management Recommendations for the Northern Goshawk in the Southwestern United States” (RM-217).

Alternative D: This alternative is patterned after DEIS comments submitted jointly by the Arizona and New Mexico state game agencies. The standards and guidelines for northern goshawk management are a verbatim rendition from their comment letter. The state game agency input depicted in this alternative is a slight variation from the recommendations developed by the Goshawk Interagency Implementation Team and from information depicted in the report “Management Recommendations for the Northern Goshawk in the Southwestern United States” (RM-217).

The management approach detailed in Alternative D is the Arizona and New Mexico state game agencies’ alternative which integrates selected

scientific papers and their conclusions on northern goshawk habitat preferences together with the commonly agreed upon components of goshawk biology and habitat needs (See Table 2). This management approach is based heavily on the view that northern goshawk require foraging areas containing large, unbroken blocks of old forest.

Alternative E: This alternative is patterned after scoping report comments received from Applied Ecosystems, Inc. Mexican spotted owl standards and guidelines generally follow Interim Directive 2 like Alternative C, but define smaller core and territory acreages (core areas 300 to 400 acres; territories 750 to 950 acres). The northern goshawk standards and guidelines are similar to those in Alternative C, except there is less VSS class 4-6 acreage and reduced canopy cover percents in the nonnest portion of the territory. Old growth would be allocated as 10 percent of the area with no specific block size minimum defined. Steep slope logging would be allowed for reasons other than timber production. Alternative E also includes the addition of standards and guidelines to guide ecosystem planning, to address forest health concerns and to guide implementation of other standards and guidelines.

Alternative F: This alternative was developed by the staff on the Apache-Sitgreaves National Forests as an example of an ecosystem approach to management for the Mexican spotted owl.

This alternative is like Alternative C except that a demonstration area would be established on the Apache National Forest to test an adaptive ecosystem approach to management of the mixed-conifer type (i.e., primary Mexican spotted owl habitat). The total acres of mixed-conifer type on the Apache National Forest is 168,244. This demonstration area stratifies the mixed-conifer type into six ecological zones.

Management emphasis for each zone would be in accordance with prescribed standards and guidelines to manage for specific vegetation desired condition in the mixed-conifer rather than the Mexican spotted owl guidelines depicted in Alternative C. The ecological zones are based on primary aspect and degree of slope. Zone 1 is North Aspect greater than 40 percent slope, Zone 2 is North Aspect 20-39 percent slope, Zone 3 is North Aspect 0-19 percent slope, Zone 4 is South Aspect greater than 40 percent slope, Zone 5 is

South Aspect 20-39 percent slope, and Zone 6 is South Aspect 0-19 percent slope. Overlapping these zones are areas that currently have administrative decisions that prohibit, or otherwise are set aside to not receive commercial timber harvest. These overlapping areas include: wilderness, primitive areas, research natural areas, all slopes greater than 40 percent, areas allocated for old growth through previous NEPA decisions, and old growth allocated through this proposal to protect Mexican spotted owl habitat.

This combined area constitutes 71,223 acres of the total mixed conifer area (168,244 acres), or 42 percent of the mixed conifer that would receive no commercial harvest under this proposal. Where commercial harvest is allowed, the following management emphasis will be applied: Zone 2 (north-facing slopes) – would be managed for timber harvest only on slopes less than 40 percent and would emphasize uneven-aged condition utilizing single tree selection, Zone 3 (north-facing slopes) – would be managed for timber harvest but again would emphasize uneven-aged conditions using single tree selection, group selection, or small group shelterwood methods. In Zones 5 and 6 (south-facing slopes), the area would be managed for a balance of an uneven-aged and even-aged condition.

For all other areas of the region (including nonmixed-conifer zones on the Apache-Sitgreaves National Forests), all standards and guidelines as depicted in Alternative C would be implemented in this alternative. This alternative would still rely on the Integrated Resource Management process to make the site specific project design decisions. A brief comparison of the different zones in the Apache-Sitgreaves National Forests mixed-conifer is presented in Table 3 at the end of this chapter.

Alternative G: This alternative was developed to respond to the Mexican Spotted Owl Recovery Plan (see Chapter 4 for Standard & Guideline Team information). Standards and guidelines for the northern goshawk were developed in early May 1995, and considered all known information from the Goshawk Interagency Implementation Team recommendations, the Arizona state game agency letter that responded to the draft forest plan amendment, and experience gained during implementation of interim direction. Appendix E contains the specific language for standards and guidelines that are associated with this alternative.

Under Alternative G, the standards and guidelines for managing across the landscape represent an ecosystem management approach. The approach used for managing goshawk habitat areas provides for many wildlife species, timber and forage. As a result, the standards and guidelines for ecosystem management in goshawk habitat areas are not focused on any single species or element.

Alternative D & G: Alternative D is exactly like Alternative G with respect to Mexican spotted owl management guidance and silvicultural emphasis. Steep slope logging would be allowed for reasons other than timber production. Appendix E depicts the specific standards and guidelines for managing the forested areas.

With respect to the northern goshawk, Alternative D differs from Alternative G in that Alternative D calls for higher stand densities outside of post-fledging family areas than called for in Alternative G. These areas include woodland, ponderosa pine, mixed conifer and spruce-fir forest cover types in the southwestern United States. In addition, all other forest types may be considered to be important habitat. Higher densities called for in Alternative D are designed to result in and promote a more closed canopy or denser forest with older trees in these areas. Alternative D also calls for the blocks with higher canopy closure to vary in size while Alternative G manages for the same canopy closures only within small groups.

The intent of Alternative D is to sustain approximately 40 percent of the landscape in old forest (large old trees) through time. This will be achieved by maintaining the existing mature (VSS 5) to old forest (VSS 6) structure across the landscape until an average of 20 percent of the landscape contains VSS 5 and 20 percent contains VSS 6 (AGFD, 1993). Similarly, Alternative G strives to maintain the same 20/20 percentage of VSS 5 and VSS 6 across the landscape. The difference between Alternatives D and G relative to mature and old forest is that Alternative D has an objective to sustain as much mature and old forest across the landscape as possible in larger blocks.

Table 4 at the end of this section of the Supplement to the FEIS summarizes the habitat attribute differences for the northern goshawk between Alternative D and Alternative G. Both alternatives originate out of commonly agreed upon habitat

components for the northern goshawk. Table 4 displays differing scientific viewpoints on northern goshawk management beyond the commonly agreed upon components in Table 1. Alternative D represents scientific viewpoints that call for larger blocks of old and mature forest than called for in Alternative G.

D. FOREST SERVICE PREFERRED ALTERNATIVE

The Forest Service preferred alternative is Alternative G. Alternative G was developed to respond directly to and implement the guidelines in the Mexican Spotted Owl Recovery Plan. It was developed in collaboration with the Fish and Wildlife Service (including a recovery team member).

As new information becomes available during implementation of the Mexican Spotted Owl

Recovery Plan, the standards and guidelines (Alternative G) incorporated by amendment in forest plans will be adjusted accordingly.

As each national forest undertakes its respective forest plan revision, this amendment language will be reanalyzed in the context of any anticipated changes in current forest plan management direction.

Chapter 3 contains a complete discussion of the expected programmatic cumulative effects from amending forest plans to include new standards and guidelines for the Mexican spotted owl and northern goshawk. Other forest plan standards and guidelines were also adjusted when they appeared to conflict with planned management direction for the two birds.

Table 1. Comparison of Basis for Development of Alternatives

Alt.	Alternative Development Criteria
A	No Action Alternative – Required under the National Environmental Policy Act: Reflects resource management direction in forest plans that existed prior to Forest Service adoption of special interim management guidelines for the Mexican spotted owl and northern goshawk.
B	Initial Scoping Proposed Action – Dropped from Detailed Study
C	DEIS Proposed Action (Modification of Alternative B – Initial Scoping Proposed Action): Mexican spotted owl guidance would follow direction stated in Interim Directive 2 (June 1990, FSM 2676) plus dispersal habitat considerations. Northern goshawk guidance would be very similar to the “Management Recommendations for the Northern Goshawk in the Southwestern United States” (MRNG) (RM-217).
D	Adjusted Goshawk Interagency Implementation Team Recommendations – Reflects comments received from Arizona and New Mexico state game agencies. Northern goshawk standards and guidelines are verbatim from jointly submitted DEIS comment letter and replace input previously supplied from the Goshawk Interagency Implementation Team. The Mexican spotted owl standards and guidelines were adjusted to reflect information in the Mexican Spotted Owl Recovery Plan.
E	Applied Ecosystems, Inc. Suggestions – Mexican spotted owl standards and guidelines generally follow Interim Directive 2 (June 1990, FSM 2676). Northern goshawk standards and guidelines are similar to those in Alternative C.
F	Apache-Sitgreaves National Forests Suggestions – Mexican spotted owl guidance would follow direction stated in Interim Directive 2 (June 1990, FSM 2676) plus have a demonstration area on the Apache-Sitgreaves National Forests. Northern goshawk guidance would be very similar to the MRNG (RM-217).
G	Mexican Spotted Owl Recovery Plan Integration Alternative – Developed to respond to the Mexican Spotted Owl Recovery Plan. Standards and guidelines for the northern goshawk were developed in early May 1995, and considered all known information from the Goshawk Interagency Implementation Team recommendations, the joint Arizona and New Mexico game agencies letter that responded to the DEIS, and experience gained during implementation of the interim direction.

Table 2. Commonly Agreed Upon Northern Goshawk Habitat Components

Component	Description / Discussion
Percent of Landscape in VSS 6	The overall landscape contains approximately 20 percent in VSS 6 (24+ d.b.h.).
VSS 1 Component	Many of the food components (primary prey species) necessary for the reproductive biology of the northern goshawk require meadows and open areas (VSS 1).
Nest Areas	Habitat components (age class, canopy closure, density) of nest areas are commonly agreed upon and are essential for northern goshawk reproduction. Goshawks use the densest stands available for nest areas. Specific values of tree sizes, density and canopy closure vary depending on the characteristics of the ecosystem.
Older Age Classes	The importance and need of forests in older age classes (VSS 5 & 6) is widely recognized. However, the quantity and arrangement across the landscape of such age classes is not generally agreed upon, particularly in unpublished work.
Growth Rates	The knowledge that tree growth in the Southwest is a limiting factor in forest structural stage development is widely recognized. The rate of establishment and growth of forest structure and composition limits habitat both spatially and temporally.
Snags & Down Woody Material	The importance of snags and down woody material across the landscape is an important habitat element for maintenance of a prey base.

Table 3. Comparison of Zones as Described in Alternative F

Zone Delineation	Slope (Percent) and Aspect	Total Acres	Available Treatment Acres	Management Emphasis
Zone 1	40 %+ Slopes North Aspects	23,915	None	Natural Evolution
Zone 2	20-39 % Slopes North Aspects	39,510	22,853	Uneven-aged – single tree selection only
Zone 3	0-19 % Slopes North Aspects	35,000	29,918	Uneven-aged – all methods
Zone 4	40 %+ Slopes South Aspects	11,470	None	Natural Evolution
Zone 5	20-39 % Slopes South Aspects	24,736	14,866	Balanced Uneven-aged and Even-aged
Zone 6	0-19 % Slopes South Aspects	33,613	29,384	Balanced Uneven-aged and Even-aged
TOTALS		168,244	97,021	

Table 4. Habitat Attribute Differences between Alternative D and Alternative G for the Northern Goshawk

Attribute	Alternative Comparison
Vegetation Types	Alternative D only addresses ponderosa pine habitat. Alternative G addresses woodland, ponderosa pine, mixed conifer, and spruce-fir habitats.
Target Tree Age in VSS 6	Both alternatives call for 20 percent in VSS 6 (24"+ d.b.h.). Both alternatives call for the same target age of 250+ years for areas designated as post-fledgling family area (PFA). For the remainder of the landscape outside the post-fledgling areas, Alternative D calls for a target age of 250+ years while Alternative G calls for 200+. The difference is that for a regulated forest on a 20-year entry, Alternative D will have fewer regeneration treatments or fewer openings than Alternative G per entry.
Group Size	Both alternatives call for management at the group, patch, site, and landscape levels.* Alternative D calls for canopy closure restrictions for not only the small group/patch scale, like G, but also at the site and landscape scale. Alternative D calls for: (1) up to 20 percent of the landscape to be managed for even-aged management for sites up to 100 acres in size; (2) large blocks of mature stands with densities managed at the site or landscape scale; and (3) retaining denser patches for hiding and thermal cover in addition to the percentages outlined for each VSS class. Alternative G mimics the natural forest conditions prior to settlement which consisted of small groups of trees and the canopy restrictions and stocking levels are based only at this small scale and tracked at the larger scales.
Old Growth and Canopy Density of VSS 5 and 6	Both alternatives require 20 percent of the area outside the nest areas and across the landscape be maintained in VSS 6 and 20 percent in VSS 5. VSS 5 areas meet most but not all of the criteria for old growth. However, the primary difference of Alternative D, from that of Alternative G, is management scale, densities and the limitations on regulation of the flow of VSS 5 and 6 across space and time.
Canopy Density VSS 3 (9-12"d.b.h.)	Only Alternative D has canopy closure restrictions on VSS 3, thereby slowing growth and development into larger VSS classes.
Hiding and Thermal Cover Allocations	Only Alternative D retains guidelines for hiding and thermal cover allocations for goshawk prey and other wildlife. Alternative G calls for no allocations as it was not needed with the change from even-aged to uneven-aged management.
Resulting Herb/Shrub Understory	The herbaceous and shrub understory amounts are in direct proportion to canopy closure. The higher the closure, the less sunlight available to develop herb/shrub understories. Alternative D will have significantly less herb/shrub understory in the larger blocks of old and mature forest based on the projected crown closure and longer target ages resulting in less regeneration.
Large Trees	Both alternatives have similar target amounts for VSS 5 and 6. However, with the higher tree and crown densities in Alternative D, growth of individual trees will be significantly slower and the amount of time to restore large trees across the landscape will take significantly more time under Alternative D than that in Alternative G. Such increases may not be possible with higher stocking levels due to potential loss of forest structure from fire, insects, and disease.

Attribute	Alternative Comparison
Spatial Distribution of Structural Components and VSS Classes	Alternative D will have structural components and VSS classes significantly less spatially distributed across the landscape than Alternative G because of the broad scales at which densities are being managed.
Even-aged vs. Uneven-aged Forest Structures	Alternative G calls for uneven-aged management and resulting forest structure. Alternative D allows up to 20 percent of the landscape to have even-aged management with the remaining areas using uneven-aged management. Mixing management of uneven-aged at the group scale with even-aged at the site level restricts ability to provide all structural components, such as large trees, at the group level and achieve target percentages of age classes adequately distributed over space and time such as 20 percent of VSS 6.

* Long, J. N. and Smith, F. W. 2000

**The following pages
replace pages 19 – 23 in the
“Final Environmental Impact Statement
for Amendment of Forest Plans”**

TES Species (34)

Affected Environment

Within the Southwestern Region, there are 45 species currently listed and 10 species proposed for listing under the Endangered Species Act (ESA). In addition, 414 species found within the region on national forests are considered to be “sensitive.” The region’s sensitive species program is designed to meet species needs, to maintain the species and their habitats, and to eliminate the need for listing under the ESA (Forest Service Manual 2670.21).

The two species of concern for these plan amendments, the Mexican spotted owl and the northern goshawk are widespread throughout the Southwest and the threat to the species is based on habitat degradation on a landscape scale.

Other sensitive species within this category include sharp shinned hawk, pine grosbeak, and the flammulated owl. Other species, like Gould’s wild turkey, are sensitive to landscape patterns; however, the reason the turkey is sensitive is due to limited habitat in the United States. The United States represents the northernmost extension of its range, and as such, it is rare because of this, not because of any changes to landscape patterns.

Many rare species are vulnerable to disturbances due to their limited distribution. Most species require site specific mitigation that will be proposed and analyzed within the analyses of individual projects. An accepted ecological approach is to do analyses at multiple scales, one above and one below that needed to analyze the site specific action. This type of analysis can only be done at the project level and is beyond the scope of this regional programmatic analysis.

Environmental Effects

The implementation of new forest plan standards and guidelines on the ground will not instantaneously coincide with the issuance of the Record of Decision based on this FEIS. A transition period will be needed to achieve full implementation of the amendment. In the short term (5 to 10 years), the effect of the new standards and guidelines with respect to desired on-the-ground conditions will vary little between alternatives. The true ramifications of the differences between alternatives

can be easily ascertained when reviewing expected long-term environmental effects.

In all alternatives, the risk is high that catastrophic events will occur within the next decade (see analysis concerning forest health). With greater restrictions, as areas with high tree densities continue to increase in density, the associated susceptibility to catastrophic events would also continue to increase. It is impossible to predict what the size or intensity will be for a given event. Even though fire and insects are a part of the ecosystem, current conditions are not “normal” and represent stressed ecosystems. The impact of any event will much more likely be catastrophic. Depending on the size of the event, there exists the potential of fragmenting the landscape which may greatly reduce the number of large old trees that currently exist.

The areas most at risk to catastrophic events are those areas with the highest tree densities. These are the areas restricted or protected for the Mexican spotted owl and northern goshawk, and these are the areas of greatest importance to the conservation of these two species. What is sustainable for these two species as well as other species tied to old forests appears to not be sustainable in the long term (200+ years) due to losses to insects and fire. However, the ecosystem as a whole (ecosystem defined as the vegetative community with all of its associated animal component) must be sustainable.

Alternative A is the “no action” alternative where existing forest plan direction is continued. This alternative would emphasize even-aged management with a rotation length not to exceed 120 years in all areas outside of those allocated for old growth and wilderness. Cable logging is allowed on steep slopes. Protection for biological diversity is limited to mitigations for specific habitat needs. Mitigations are generally limited in scope (e.g., protection for the northern goshawk limited to a buffer around nest trees). Old growth associated species like the Mexican spotted owl and the northern goshawk will have limited habitat, primarily associated with the areas set aside for old growth and wilderness. Special habitat components, like snags and large down logs, are limited in scope with guidelines that include only a limited percentage of the suitable timber base. Surveys for the Mexican spotted owl and the northern goshawk are limited. For the northern goshawk, there is a

heavy dependence on timber markers to find nesting sites. Existing grazing standards and guidelines generally call for the existing livestock stocking levels to be in line with capacity in the first or second decade. Not all existing forest plans have specific utilization rates for grazing animals.

The existing forest land management plans throughout the region were determined not to be adequate for Mexican spotted owl and northern goshawk. The existing forest plans would also have an adverse affect on the listed Mt. Graham red squirrel and Sacramento Mountain thistle and may cause the following sensitive species to trend toward listing: northern goshawk, flammulated owl, sharp-shinned hawk, Kaibab squirrel, Jemez Mountains salamander, Sacramento Mountain salamander, Kaibab pincushion cactus, and Arizona leatherflower.

Many sensitive aquatic species are also trending toward listing under current forest plan implementation due to grazing management. The species identified are limited to those within forested habitats. Many other species may be impacted by current management under existing forest plans; however, with the exception of grazing utilization rates, these species are in other habitats (e.g., desert, aquatic, etc.) and are outside the scope of this analysis.

The flammulated owl and the sharp-shinned hawk depend on old growth and would be adversely impacted if old growth was limited only to that designated to be set aside. Conservation strategies have been or are being prepared for the Jemez Mountains salamander, Sacramento Mountain salamander, Kaibab pincushion cactus and may ultimately lead to amendment of forest plans. The Mount Graham red squirrel and Sacramento Mountain thistle have existing recovery plans.

Alternatives C and F articulate the Mexican spotted owl and northern goshawk habitat requirements into standards and guidelines. This alternative does not represent the most current knowledge for the Mexican spotted owl that has been published in the recovery plan. The proposed demonstration area on the Apache-Sitgreaves National Forests in Alternative F would depart from the recovery plan.

Because these alternatives do not fully implement the current Mexican spotted owl recovery plan, they

would have an adverse affect on the Mexican spotted owl and, thus, may not lead to its recovery. Grazing utilization rates would be restricted to occupied owl and goshawk territories and would not be applied across the landscape. Numerous sensitive species tied to aquatic ecosystems may be impacted with a possible trend toward listing. The listed southwestern willow flycatcher would continue to be adversely affected due to current grazing management.

Alternative D is very similar to Alternative G. The primary difference is that it is written in a more “regulatory” format. This alternative calls for territory establishment if a landscape approach is not used. It is recommended that a landscape approach be used (similar to Alternative G). Alternative G calls for additional surveys if needed while this alternative specifically calls for 2 years of surveys. Alternative D calls for all trees to be grown to at least 250 years, while Alternative G uses 200+. Alternative G recommends a range for reserve trees where Alternative D recommends four trees per acre in ponderosa pine. Alternative D recommends maintaining all existing standards and guidelines for hiding and thermal cover. Alternative G does not address hiding and thermal cover, thus there would be no change in these standards and guidelines.

Alternative D addresses old growth as it relates to “blocks.” Alternative G proposes to restore or maintain a minimum of 20 percent of the landscape as old growth. It does not specify the use of “blocks.” Instead, patterns are to be provided that allow for a flow of the old-growth functions and interactions at multiple scales across the landscape through time. The 20 percent is the amount of the landscape and not specific acres. Alternative G is similar to Alternative D in that all existing old growth is to be maintained.

The same standards for Mexican spotted owl described in Alternative G also apply for Alternative D. Therefore, the affects on the Mexican spotted owl will be the same: may affect, not likely to adversely affect. Grazing utilization rates would apply only to occupied territories; therefore, the effects of grazing on MSO will be the same as Alternatives C and F.

In addition to may affect, not likely to adversely affect the Mexican spotted owl, Alternative D would have a beneficial affect on the following sensitive

species: flammulated owl, sharp-shinned hawk, and Kaibab squirrel. Without changes in grazing in all cover types, Alternative D would not change the current adverse impacts on aquatic species outside MSO and northern goshawk habitat identified in Alternative A.

Alternative E stresses conditions that favor sustainability of vegetation over sustainability of the northern goshawk. This alternative has many benefits over the existing standards and guidelines currently found in existing forests plans. It is highly likely that, as we learn more about the ecosystem and the needs of specific wildlife species, desired vegetative conditions may approach what is described in this alternative. However, as stated in the section immediately before discussion of the individual alternatives, both the vegetative communities as well as the associated animal species must be sustainable but conditions described for either side are usually different due to the lack of knowledge concerning the ecosystems.

Since this alternative does not fully implement the current Mexican spotted owl recovery plan, it would have an adverse affect on the Mexican spotted owl and may not lead to its recovery. Numerous sensitive species tied to aquatic ecosystems may be impacted with a possible trend toward listing. The listed southwestern willow flycatcher would continue to be adversely affected due to current grazing management.

Standards and guidelines for the northern goshawk are limited only to occupied areas and do not allow for population expansion or shifts. Guidelines pertaining to nest size, percent of area in VSS 4, 5, and 6, and the number of reserve trees have lower values than those recommended within the goshawk recommendations. It is not clear how long trees would be allowed to grow. It is stated that old growth be limited to 10 percent of the land area under management. Trees outside of these old-growth areas will be allowed only enough time to grow to the size defined within the different VSS classes and the VSS 6 would not have the age that would exhibit old-growth characteristics.

This alternative would have an adverse affect on the northern goshawk. It may also have an adverse affect on other sensitive species, i.e., sharp-shinned hawk and flammulated owl. Listed and sensitive species tied to aquatic ecosystems that are currently being impacted by the current application

of grazing will continue their adverse impact or continue their trend toward listing.

Alternative G incorporates the needs of the Mexican spotted owl and northern goshawk. The science used to determine these needs are contained in two publications, "Mexican Spotted Owl Recovery Plan" and "Management Recommendations for the Northern Goshawk in the Southwestern United States" (GTR RM-217, 1992). Both publications endorse the concept of managing ecosystems; however, only the recommendations for the northern goshawk incorporate a long-term approach. Recovery recommendations for the Mexican spotted owl are for the short term and take precedence over all other recommendations for nonlisted species due to its listed status under the Endangered Species Act.

This alternative deals primarily with the habitat of these two species which consists of the forested ecosystems of pinyon-juniper, pine-oak, ponderosa pine, and mixed conifer. With the exception of grazing management modifications, existing standards and guidelines outside these ecosystems will remain essentially unchanged.

Under the Mexican spotted owl recommendations all protected activity centers (PACs) and slopes greater than 40 percent will be protected with no timber harvest being allowed. All areas with ponderosa pine/gamble oak and mixed conifer vegetative types will be "restricted." In restricted areas, all sites meeting "threshold" conditions will be maintained with no timber harvest of trees > 12" diameter at breast height (d.b.h.). Harvest of trees between 12" and 24" d.b.h. will only be allowed within restricted areas outside of those sites meeting target conditions and only on up to 20 percent of the restricted areas. Trees over 24" d.b.h. will be maintained throughout the restricted and protected areas. Excess trees to be harvested will be based on a "Q" of 1.4 or less. A more detailed description is contained in "Draft Mexican Spotted Owl Recovery Plan," March 1995.

Under the northern goshawk recommendations all nest sites and post-fledgling areas (PFAs) will be restricted with higher stocking levels (canopy cover). All areas outside of PFAs will have the desired stocking levels correlating to an average of 40 percent canopy cover with a high contrast both above and below. As stated above for both the Mexican spotted owl and northern goshawk, the

landscape will contain trees that are uneven-aged allowing for more large, old trees. A more detailed discussion of the recommendations are contained in, “Management Recommendations for the Northern Goshawk in the Southwestern United States” (RM-217).

Two listed species—Sacramento Mountains thistle and Mount Graham red squirrel—could be impacted due to the restrictions that would not allow the Forest Service to do any vegetative manipulation in “protected” areas (i.e., PACs, steep slopes, and stands that meet threshold conditions). Without being able to reduce fuels, the Mount Graham red squirrel will continue to be at greater risk to wildfires. Without being able to reduce tree densities and lessen the potential risks from catastrophic fires, springs and seeps containing Sacramento Mountains thistle will be impacted with the possible loss of springs and seeps. Within the limited habitat for these two listed species management activities necessary to implement their recovery plans will take precedence and will be exempt from the conflicting Mexican spotted owl standards and guidelines. Alternative G has the flexibility to mitigate any adverse impacts at a project or site level.

In addition to the forest structure, the health of the herbaceous and shrub components of the ecosystem is also important for the prey species associated with the Mexican spotted owl and northern goshawk. To maintain this part of the ecosystem, grazing utilization rates are proposed. These rates differ based on range condition with the intent of maintaining good to excellent range conditions where they exist and to restore range that is in poorer condition. Ecologically it makes little sense to limit the utilization rate guidelines to only Mexican spotted owl and northern goshawk habitat; therefore, the utilization guidelines are being proposed across the landscape in all vegetation cover types.

For all listed species, Alternative G may affect, but will not adversely effect any species. For all sensitive species, Alternative G may impact individuals, but no species will trend toward Federal listing and there will be no loss of viability.

Due to the proposed grazing utilization rates there will be a beneficial effect on all listed and sensitive species tied to riparian and aquatic habitats where degradation of habitat due to grazing has been

identified as the primary reason for listing (e.g., southwestern willow flycatcher) or for including a species within the regional sensitive species list (e.g., numerous native fish species).

Brief Summary of the Management Recommendations for the Northern Goshawk

Because the “Management Recommendations for the Northern Goshawk in the Southwestern United States,” (MRNG) (Reynolds et al. 1992) is the focus of the scientific debate, a summary of the MRNG is presented here for reference.

At the core of the MRNG are the recommendations for management of three components of the northern goshawk’s home range: the nest area, the post-fledgling family area (PFA), and the foraging area. The authors of the MRNG state, “...the largest areas (acres) reported in the literature, rather than the average or smallest, were used when developing the management recommendations for the nest area, PFA and foraging area” (Reynolds et al. 1992, p 21).

For the nest area, the MRNG suggests: (1) maintaining 3 suitable and 3 replacement nest sites totaling 180 acres; (2) all nest areas are best located one-half mile from each other; (3) in ponderosa pine 30-40 trees per acre, 16-22 inches d.b.h., 200+ years old and a canopy closure of at least 50 percent.

For the PFA, the MRNG calls for: an area of 420 acres not including the 180 acres for nest areas, centered around the nest area, with 60 percent in the oldest stands to include 2 snags per acre, 3 large downed logs per acre and mature and old forest composed of live trees in clumps or stringers with interlocking crowns. In ponderosa pine forests, the MRNG calls for a minimum of 50 percent canopy cover with clumps of the mature (VSS 5) and old (VSS 6) forest age classes, and a minimum 60 percent canopy cover within one-third of the mid-aged (VSS 4) clumps and 50 percent canopy cover within the remaining two-thirds of the mid-aged clumps of trees.

For the foraging area in ponderosa pine, the MRNG suggest management on approximately 5,400 acres not including the nest areas and the PFA, 60 percent of which should be in the 3 oldest age classes (mid-aged, mature and old forest), at least 2 snags per acre, 3 downed logs per acre, a

minimum of 3-5 old large trees per acre in clumps with a minimum canopy closure of 40 percent within the clumps of mature and old live trees.

Review of Pertinent Information Concerning Habitat Management for the Northern Goshawk

This section of the FSFEIS reviews and discusses scientific points of view, which differ from, or are contrary to those used to develop the MRNG, on which Alternative G is based. It provides an assessment of those differing points of view in terms of whether or not the findings in those papers would result in a change in the Agency's preferred alternative, and ultimately its decision.

This section also presents information which was developed after the 1996 amendment, but relates to the disclosure of pertinent information concerning northern goshawk habitat management.

The discussion was facilitated by a review of the contrary scientific points-of-view written by Reynolds et al. 2001. This section then draws conclusions based in part on the review, thereby providing a reasoned discussion of the relevant but differing scientific points-of-view concerning habitat management for the northern goshawk.

The scientific debate concerns the degree to which the northern goshawk requires old or mature forest with dense closed canopies. While all goshawk scientists agree that some old or mature forest is needed within goshawk home ranges, they differ over the necessary amount and arrangement of such forest.

A. This review is based in part, on the following documents printed before the 1996 amendment:

1. A 1986 paper by Crocker-Bedford and Chaney, titled "Characteristics of Goshawk Nesting Stands," later published in 1988 in the Proceedings of the Southwest Raptor Management Symposium and Workshop, Tucson Arizona.
2. A second paper by Crocker-Bedford titled "Goshawk Reproduction and Forest Management," *The Wildlife Society Bulletin* Vol. 18, No. 3, Fall 1990.
3. A paper by Ward, Ward and Tibbitts, April 1992, titled "Canopy Density at Goshawk

Nesting Territories on the North Kaibab Ranger District, Kaibab National Forest," Final Report, Arizona Game and Fish Department.

4. A letter from the U.S. Fish and Wildlife Service on August 13, 1992, commenting on the "Recommendation for Goshawk Management in the Southwest Region."
5. An Arizona Game and Fish Department white paper of May 1993, outlining their concerns on the recommendations for goshawk management in the southwest region.
6. A letter from New Mexico Department of Game and Fish, November 28, 1995, commenting on the "Final Environmental Impact Statement for Amendment of Forest Plans."
7. Eleven papers written and/or published prior to 1996, which reported on studies of northern goshawk habitat use and preferences:
 - i) Fischer (1986)
 - ii) Hargis et al. (1994)
 - iii) Bright-Smith and Mannan (1994)
 - iv) Austin (1993)
 - v) Beier (1994)
 - vi) Titus et al. (1994)
 - vii) Crocker-Bedford (1994)
 - viii) Crocker-Bedford (1995)
 - ix) Snyder (1995)
 - x) Woodbridge and Detrich (1994)
 - xi) Titus et al. (1996)
8. A document of December 1, 1994, titled "Comments on the Draft Environmental Impact Statement and Proposal to Amend Ten National Forest Land Management Plans" by Suckling et al.
9. A document of March 1996, by The Wildlife Society, on Technical Review 96-2 of "Northern Goshawk and Forest Management in the Southwestern United States" by Braun et al.

Key points from these documents are summarized as follows.

A.1. Crocker-Bedford and Chaney (1988) reported on a 3-year study which evaluated nesting habitat of the northern goshawk on the North Kaibab Ranger District, Kaibab National Forest, in northern Arizona. Their results demonstrated that goshawks nest in the densest stands available under the conditions of the North Kaibab. They found that goshawks totally avoided nesting in stands with less than 60 percent canopy cover and most preferred having more than 80 percent canopy cover. Their study also showed that goshawk nesting stands had much higher densities of large trees than were otherwise present in the typical stand on the North Kaibab.

A.2. In his 1990 paper, Crocker-Bedford reported on a study designed to test the adequacy of nest habitat buffers for maintaining goshawk reproduction. This study also occurred on the North Kaibab Ranger District. Although the data showed an average territory included 2.3 known nest trees, Crocker-Bedford believed there were 3. He also found that nest buffers, either large or small, did not maintain goshawk reproduction. Where timber harvest had occurred around buffers, reproduction rates were 75-80 percent lower and nestling production was 94 percent lower. Crocker-Bedford also noted that goshawk nesting density appeared to be closely associated with dense overstories and open understories.

A.3. In their 1992, “Canopy Density at Goshawk Nesting Territories on the North Kaibab Ranger District, Kaibab National Forest,” report, Ward, Ward and Tibbitts discussed the results of their investigation on the relationship between goshawk breeding activity and canopy density on the North Kaibab Ranger District of the Kaibab National Forest. They found that active territories had a higher proportion of stands with 40-60 percent canopy closure than did inactive territories. They also found active territories had a greater percentage of stands with 60-80 percent canopy closure. They surmised that relatively closed canopy and mature forest conditions, recognized as critical goshawk nest stands, are also important across wider areas of goshawk home range.

A.4. On August 13, 1992, the USDA Forest Service, Southwestern Region received a letter from the Regional Director of the Southwest Region of the U.S. Fish and Wildlife Service (Service) providing preliminary comments to the “Recommendations for Goshawk Management in the Southwest Region.”

The Service stated, “The recommendations are founded on a series of premises which are poorly supported by the published data. They are:

1. That little information is available on goshawk foraging habitat, but what exists suggests they are habitat generalists.
2. That in the Southwest, goshawks are limited by prey abundance.
3. That the most important goshawk prey species in the Southwest are known.
4. That enough is known of the 14 prey species’ biology to define and manage for their habitats.
5. That suitable goshawk foraging habitat and sufficient prey will be provided by managing for those prey species” (USFWS 1992, p 1).

In their letter, the Service discussed their concerns with each premise individually. Concerning premise number one the Service stated, “A considerable body of literature contradicts the recommendations’ position that goshawk foraging habitat is poorly understood. This literature also contradicts the recommendations’ characterization of the goshawk as a ‘forest habitat generalist’ ” (USFWS 1992, p 1). The Service suggested that the recommendations used flawed reasoning in suggesting that, because goshawks may encounter a mosaic of forest types in their home ranges, they use all of those forest types. The Service then cites several authors (Fischer 1986, Kenward 1982, Bloom et al. 1985, Crocker-Bedford 1990) among others to support the argument that goshawks prefer to nest and forage in large tracts of closed canopy, older or mature forest. In a concluding statement, the Service noted, “The majority of published evidence suggests that the recommendations’ forest mosaic will be inferior or unsuitable goshawk habitat” (USFWS 1992, p 2).

Concerning premise number two, the Service noted, “The recommendations’ observation that goshawks, like some other raptors, should be limited by prey availability is valid. However, the recommendations only consider simple prey abundance, not prey availability” (USFWS 1992, p 2). The Service goes on to say, “Prey availability is a function of prey abundance, and the susceptibility of prey to the foraging ecology of the goshawk.

Plentiful literature demonstrates that the goshawk is specialized to capture prey in the complex structural environment of a forest” (USFWS 1992, p 3).

In their comments on premise three the Service stated, “The Service believes the recommendations were developed with too little information on goshawk diets in the FS Southwestern Region” (USFWS 1992, p 3). And, “Creating the structural forest environment to which goshawks are adapted will create availability of prey” (USFWS 1992, p 4).

Regarding premise four, the Service concluded, “The recommendations built a management prescription based on the vaguely understood habitat needs of 14 species, rather than the better understood habitat needs of the goshawk” (USFWS 1992, p 4).

In their summary statement regarding premise five the Service said, “The available information suggests that the converse is more scientifically sound. By providing the mature forest to which goshawks are behaviorally and morphologically adapted, prey availability will be provided” (USFWS 1992, p 5).

A.5. The Service, like the Arizona Game and Fish Department (AZGF), also commented on the use of minimum values instead of targets. The argument here is that by managing for minimum values, goshawk habitat quality will be degraded over time.

In May of 1993, the AZGF released a document titled “Review of U.S. Forest Service Strategy for Managing Northern Goshawk Habitat in the Southwestern United States.” In that document AZGF raised a concern related to management of foraging areas for the northern goshawk, specifically that “application of the Interim Guidelines and Implementation Guidelines for the foraging area will result in forest conditions which do not adequately meet the needs of the goshawk and other wildlife species” (AZGF 1993, p 5).

They further stated that they consider the goshawk a “forest habitat specialist” that is strongly associated with mature, dense forest structure in many forest types” (AZGF 1993, p 12). To support this argument the AZGF cited (Mannan and Smith 1993, Austin 1991, Kennedy 1989, Hargis et al. 1994, Crocker-Bedford 1990a, Fischer 1986 and Ward et al. 1992). The AZGF cited these studies as supporting the perspective that the northern

goshawk and its prey prefer mature forest with dense canopies. The AZGF also stated a concern that more open foraging areas would give a competitive advantage to other raptors.

A.6. In their letter of November 28, 1995, the New Mexico Department of Game and Fish (NMDGF) provided comments on the “Final Environmental Impact Statement for Amendment of Forest Plans in the Southwestern Region.” They stated “The Department finds the preferred alternative (G) to be a substantial improvement over the previous alternatives in the draft EIS, in that it appears that an opportunity to accomplish ecosystem management goals is provided” (NMDGF 1995, p 1). The NMDGF did have two concerns: (1) that a lack of specificity in standards and guides may provide too much flexibility for interpreting the intent of management, and (2) that no discussion of the benefits of fire or insects to forest structure is provided.

A.7. The following 11 papers are variously cited in the literature as supporting the argument that the northern goshawk is a habitat specialist that requires mature or old forest with large trees and dense canopies in both the nesting stand and the foraging area.

A.7.i. Fischer (1986) studied three coexisting *Accipiter* species in Utah from 1982-85. The study area ranged in elevation from a high of 3,350 m, to a low of 1,370 m. Vegetation varied greatly by elevation consisting of Gambel’s oak, big-toothed maple, white fir, Douglas-fir, quaking aspen, spruce, and sub-alpine fir. Fischer measured 16 habitat variables including canopy height, canopy depth, tree density and tree diameter.

Fischer found that northern goshawks used available habitat non-randomly, showing a strong preference for white fir/Douglas-fir woodland. On several occasions he observed northern goshawks capture prey in open areas such as ski trails and avalanche zones. Fischer stated, “It was obvious that these open areas were hunted, even though few radio locations were recorded there” (Fischer 1986, p 10). Fischer found that the prey of the northern goshawk included appreciable numbers of both birds and small mammals. Fischer found the dominant mammals in the diet of the northern goshawk to be ground squirrels, rock squirrels and chipmunks. None of these species are old-growth obligates. Fischer (1986) further stated, “Northern

goshawks, the largest species, foraged significantly more often in more open forest types” (p 15).

A.7.ii. Hargis et al. 1994, conducted a study of habitat use by northern goshawks on the Inyo National Forest located on the eastern slopes of the southern Sierra Nevada Mountains in California. They radio tracked eight females and two males over three summers. They found that the 10 adults they tracked were associated with 6 territories. The results of this study are widely cited by other authors. However, their results are often only partially cited (personal communication on April 2, 2004, between Dr. Hargis and Wally Murphy).

In the Discussion and Management Implications section of their document Hargis et al. (1994) reported, “By using areas that were geographically removed from their nest stands, goshawks were able to include vegetation types and patterns that were generally uncommon, such as riparian vegetation, wet meadows, and old-growth stands adjacent to meadows or pumice flats” (p 72).

“Our telemetry data indicated that perched goshawks tended to be found in well-canopied stands with large trees. These locations may have provided hunting perches, thermal cooling, or protective cover.” And, “The selection of areas with high diversity corresponds to the degree of interspersed by common goshawk prey species” (Hargis et al. 1994, p 72).

“Regardless of the absolute values, goshawks in our study selected stands that were denser than the average available, both for nesting and foraging, as measured by basal area, canopy closure, and the number of trees in all five diameter classes.” Furthermore, “...the selection for stands with the most canopy cover and largest diameter trees can be translated to the site potential for different regions. Yet our study indicates that goshawks select areas that are vegetatively diverse for foraging, including numerous aggregations of mature trees for nest stands and perch sites” (Hargis et al. 1994, p 73).

In conclusion Hargis et al. (1994) stated, within the home range of the goshawk, “...emphasis should be placed on creating or maintaining vegetative diversity, retaining mature timber around permanent water sources and along forest-open edges, and ensuring that a portion of the range provides forest stands that have structural attributes similar to

those found at the nest site for each particular geographic area” (p 73).

A.7.iii. In 1993, Mannan and Smith produced a document titled, “Habitat Use by Breeding Male Northern Goshawks in Northern Arizona, Final Report,” USDA Forest Service Cooperative Agreement No. 28-C1-556. In 1994, after changing senior authors, Bright-Smith and Mannan published the results of the same study in *Studies of Avian Biology* No. 16:58-65, 1994. This review cites the second document.

As a basis for their study, Bright-Smith and Mannan (1994) equipped five and nine male goshawks with radios in 1991 and 1992 respectively. The study was conducted on the North Kaibab Ranger District, Kaibab National Forest, in northern Arizona. The main pattern they found was the mean rank of relative preference of all hawks increased with increasing canopy closure. Bright-Smith and Mannan acknowledged the limitations of their measurements of canopy closure from aerial photos, but stated, “our findings support the general idea of maintaining relatively high canopy closure over a significant portion of areas managed for foraging goshawks” (Bright-Smith and Mannan 1994, p 64).

A.7.iv. As part of a Masters Degree program at Oregon State University, Austin (1993), studied 10 radio-equipped northern goshawks on the Shasta-Trinity and Klamath National Forests, in the Southern Cascade Mountains of northern California. In this study, Austin investigated home range size in relation to two objectives: (1) estimate the average home range, and (2) describe the use of habitats within home ranges by breeding goshawks.

Austin (1993) found: (1) Goshawks selected the closed-mature/old-growth habitat with more than 40 percent average canopy closure, and (2) early successional forest or unforested areas seemed to be less important, i.e., seedling/sapling/grass-forb.

Because of her study, Austin (1993) recommended at least 20 percent of the management area be in closed-mature/old-growth habitat (trees greater than 21 inches d.b.h. and average canopy closure over 40 percent).

A.7.v. Beier 1994, authored “Selection of Foraging Habitat by Northern Goshawks on the Coconino

National Forest,” Arizona Game and Fish Department Heritage Grant Project Number 1-94025, Progress Report. Beier investigated habitat selection within the home range, rather than how home ranges are located in a larger landscape. Beier tracked 16 radio-tagged adult goshawks.

Beier (1994) found prey abundance did not seem important in selection of foraging areas by goshawks. He stated, “The most striking finding was that used plots showed enormous variation in vegetation structure.” And, “...the range of sites used by goshawks was impressively broad...” (Beier 1994, p 4). He also found used plots had more trees overall, more trees in the 8-16" d.b.h. class and >16" d.b.h. size class, and more trees > 18 m tall.

A.7.vi. Titus et al. 1994, prepared a Final Annual Project Report, for the USDA Forest Service, Alaska Region, Tongass National Forest, “Northern Goshawk Ecology and Habitat Relationships on the Tongass National Forest.” This study had five objectives:

1. Locate additional goshawk nest sites and characterize nest site objectives
2. Determine goshawk home ranges and habitat associations using radio-telemetry
3. Evaluate the diet of goshawks during the nesting period
4. Determine the short-term dispersal distances and survival rates of juvenile goshawks when possible, and
5. Assess sub-specific variation in *A.g. laingi* for Southeast Alaska.

Relevant to this discussion, Titus et al. found that 83 percent of the goshawk nests they discovered were located in old-growth stands and 17 percent were located in 90+ year-old, second-growth stands.

A.7.vii. In May of 1994, Crocker-Bedford prepared “Conservation of the Queen Charlotte Goshawk in Southeast Alaska” as an appendix to “A Proposed Strategy for Maintaining Well-Distributed, Viable Populations of Wildlife Associated with Old-Growth Forests in Southeast Alaska” by Suring et al. Crocker-Bedford reported, “Closed canopies appear

to provide preferred microclimate in the nesting stand, increased productivity of some important prey species, and reduced competition and predation by open-forest raptors.” And, “In southeast Alaska 92 percent of the relocations on radio-tagged goshawks were in old-growth forests having over 8 mbf/ac. Old-growth having over 20 mbf/ac. was most preferred” (Crocker-Bedford 1994, p 1).

Crocker-Bedford cited numerous authors including: Allen 1978, Speiser and Bosakowski 1987, Reynolds et al. 1992, Hall 1984, and Hennessy 1978, to support the argument that goshawks typically nest in taller mature or old-growth forest stands, either coniferous or deciduous, which have relatively dense canopies. Crocker-Bedford and Chaney (1988) stated, “a demonstrated preference (use compared to availability) for nesting in stands of large trees with dense canopies ($P < 0.0001$), and suggested such preference was associated with similar stands in the vicinity used for foraging” (Crocker-Bedford 1994, p 8). It was also noted that closed canopies may be associated with overall prey abundance.

A.7.viii. Crocker-Bedford 1995, published an abstract of a paper presented at the annual meeting of Raptor Research Foundation, Goshawk Symposium, November 3, 1994, Flagstaff, Arizona, titled “Northern Goshawk Reproduction Relative to Selection Harvest in Arizona.” In an abstract of his presentation, Crocker-Bedford separated 53 nest clusters into four categories: 12 in assumed home ranges which had received little or no harvesting (1973-1986), 14 which had selection harvesting on 10-39 percent of each home range area, 16 which had harvesting on 40-60 percent of each home range area and 11 which had selection harvesting between 1973-1986 on 70-90 percent of each home range. For the four categories respectively, occupancy rates were 83 percent, 43 percent, 31 percent and 0.00 ($P, 0.001$). Crocker-Bedford summarized his conclusion with, “These and other data could indicate some real decline in the local breeding population and productivity, and/or represent movement of successful breeders from more logged to less logged areas” (Crocker-Bedford 1995, p 43).

A.7.ix. In April 1995, H. Snyder published a Final Grant-In-Aid report for the Arizona Game and Fish Department titled, “Apache Goshawk Conservation Biology in Southeast Arizona.” This study was

based on a 1-year contract between the AZGF and Coronado National Forest. Snyder had eight goals, two of which are pertinent to this discussion: (1) to produce a database containing nest-area locations and habitat measurements, including maps and photographs, for use by resource managers; and (2) to describe the foraging range and habitat utilization of selected pairs in three different habitats, with emphasis on the use by the Apache goshawk of oak woodlands. Snyder noted, “Most goshawk habitat on the study area is extremely disjunct, and in the case of these four pairs a complete search was relatively easy because the area was relatively small and much of the intervening terrain was sparsely vegetated with rocky outcrops and cliffs.” And, “It is interesting that no nests were found in aspens although a special effort was made to search for nests in these trees” (Snyder 1995, p 16 and 22). Snyder also reported a minimum of 50 percent or greater canopy closure at nest sites.

A.7.x. In 1994, Woodbridge and Detrich published “Territory Occupancy and Habitat Patch Size of Northern Goshawks in the Southern Cascades of California,” in *Studies in Avian Biology* No. 16:83-87. In this study, Woodbridge and Detrich describe spatial patterns of habitat use by nesting goshawks at four levels of resolution: nest trees, nest stands, territories (clusters of nest stands), and spacing between territories. Woodbridge and Detrich found the following: (1) mean occupancy rates of habitat components increased as spatial scale increased from nest trees to nest stands and (2) nest stand clusters, despite intensive timber harvest and fragmentation of mature forest, supported high densities of nesting goshawks.

A.7.xi. Building on an ongoing study (discussed under A.7.vi.), Titus et al., 1996, reported results from multiyear goshawk nest surveys on the Tongass National Forest in Southeast Alaska. This study had the same five objectives as noted in A.7.vi: Titus et al. (1996) found that after three field seasons the total number of known nest sites in southeast Alaska was low compared to other parts of the country. Nest site productivity averaged 2.3 young/nest. For comparison purposes goshawk habitat in Southeast Alaska is far too different from ponderosa pine forest in the Southwest to make valuable comparisons (see Reynolds 2004).

A.8. On December 1, 1994, a coalition of environmental groups led by the Southwest Center

for Biological Diversity provided “Comments on the Draft Environmental Impact Statement and Proposal to Amend Ten National Forest Land Management Plans,” prepared by Suckling et al. In this document, Suckling et al. provided an extensive review and critique of the “Management Recommendations for the Northern Goshawk in the Southwestern United States” (MRNG), pages 17-28.

In their assessment, Suckling et al. began by critiquing two basic assumptions in the MRNG:

- “Goshawks do not require extensive stands of canopied forest, but do require high levels of interspersion.
- Goshawks are dependent upon prey abundance not availability, and therefore do not directly select for forest structure” (Suckling et al. 1994, p 17).

In critiquing the first assumption, Suckling et al. (1994) noted, “None of the voluminous goshawk literature is cited to support these very unconventional notions of ecosystem management and goshawk ecology” (p 18). And, “Goshawk literature is relatively consistent in strongly associating goshawks in the United States with extensive forests or large stands of mature and old-growth trees” (p 19). Suckling et al. cites at least 35 papers to support this objection.

From these citations, Suckling et al. conclude the following: goshawk nesting habitat is generally mature and extensive, nest productivity increases with amount of mature forest, re-occupancy rates are higher in extensive mature forest, home ranges are smaller and overlap is greater in more extensive forests, logging in mature and old-growth forests diminishes the habitat elements necessary for successful nesting and foraging, logging fragments contiguous forest tracts making less suitable goshawk habitat, intra/interspecific competition for nest sites and prey items is increased by forest fragmentation and predation on goshawks may be increased by forest fragmentation.

In critiquing assumption two, Suckling et al. (1994) noted, “It is true that goshawks use a variety of forest types as foraging areas. It does not follow, however, that they are forest generalists. Goshawks are forest specialists with a strong and demonstrated preference for mature forests” (p 25).

Suckling et al. (1994) also noted, “Studies not cited by the MRNG suggest goshawks require mature forest structures for foraging” (p 26).

To support this argument Suckling et al. cite Fischer 1986, Fischer and Murphy 1986, Widen 1989, Austin 1991 and 1993, Hargis et al. 1993, and Crocker-Bedford and Chaney 1988, among others. A number of these papers have been reviewed, in this document.

A.9. In March 1996, The Wildlife Society released “Northern Goshawk and Forest Management in the Southwestern United States,” Technical Review 96-2 by Braun et al. This document emerged from a request by the Arizona Chapter of The Wildlife Society for the formation of a panel of scientists to review the interim guidelines and related forest management activities in the Southwest. The review team was formed jointly by The Wildlife Society and the American Ornithologists Union.

The panel was requested to review the scientific basis for the goshawk interim management guidelines resulting from the “Management Recommendations for the Northern Goshawk in the Southwestern United States.” The panel’s specific charges were to: (1) review the scientific literature concerning northern goshawk biology and management in the Southwest; (2) evaluate the scientific basis and policy guidance for the interim guidelines; (3) perform an on-the-ground inspection of forest management conditions in the Southwest relative to implementation of the interim guidelines; and (4) prepare a report outlining the review panel’s findings and recommendations.

In making their report, the review panel came to 12 conclusions:

1. “The scope and review of the biology of northern goshawks in the ‘Management Recommendations’ are excellent.”
2. The “Management Recommendations” represent an innovative approach to forest management because they encourage forest managers to consider forest ecosystems as assemblages of interacting species of plants and animals.
3. The “Management Recommendations” and related USFS policy lack substantive considerations for evaluating the

effectiveness and testing the consequences of implementing these practices.

4. No evidence was presented to indicate that northern goshawk populations are declining, threatened, or endangered in the Southwest or anywhere in its range, and we found no evidence of a long-term decline in goshawk breeding populations...
5. The complexity of detail for silvicultural treatments in the “Management Recommendations” indicates a preciseness of management that cannot, and probably need not uniformly be achieved over large areas...
6. Surveys of goshawks should be standardized and conducted in all southwestern forests to establish baseline data on population status and trends in all seasons, and to monitor the status of goshawks.
7. Northern goshawks use a variety of forested habitats during the nesting period...
8. Significant research should be conducted on habitat and prey requirements during the nonnesting period (September - March).
9. Implementation of prescriptions in the “Management Recommendations” must be carefully considered and recognize the diverse growing conditions and inherent heterogeneity of southwestern forests.
10. In the absence of frequent ground fire, healthy southwestern ponderosa pine forests need management... the “Management Recommendations” should contribute to a healthy, heterogeneous forest...
11. Proper management of southwestern forests must involve an ecosystem/landscape approach and should not be narrowly focused on one species... the “Management Recommendations” represent a major step toward research and management of ecosystems at a landscape scale...

12. The public needs to learn ponderosa pine forests in the Southwest were open and park-like in the pre-settlement period...” (Braun et al. 1996, p 10-11).

B. New information concerning management of northern goshawk habitat has also become available since the 1996 regional amendment and significant points of these papers are summarized in the following review.

1. A paper by Beier and Drennan titled “Forest Structure and Prey Abundance in Foraging Areas of Northern Goshawks,” published in *Ecological Applications*, 7(2), 1997.
2. A document of October 30, 2001, titled “Review of Supplemental Information Relevant to Habitat Management for the Northern Goshawk in the Southwestern United States” by Reynolds et al.
3. Reynolds et al. 2003, Rocky Mountain Research Station Progress Report titled “Population Ecology, Demographics, Habitat, and Genetics of the Northern Goshawk on the Kaibab Plateau, Arizona.”
4. An unpublished paper by Crocker-Bedford dated April 10, 2003, titled “Habitat Effects on Northern Goshawks.”
5. A review of January 9, 2004, by R. T. Reynolds of over 180 documents including peer-reviewed publications, theses, reports, and draft manuscripts for information on how goshawks use habitats in both the breeding season and winter, titled “Is the Northern Goshawk an Old-growth Forest Specialist or a Habitat Generalist?”
6. A 2004 Wildlife Society Technical Review 04-1, titled “The Status of Northern Goshawks in the Western United States,” by Anderson et al.
7. Thirteen additional papers which studied habitat associations of northern goshawks published since 1996:
 - i) Patla (1997)
 - ii) Widen (1997)
 - iii) Good (1998)
 - iv) Reynolds and Joy (1998)

- v) Lapinski (2000)
- vi) Boal et al. (2001)
- vii) Ingraldi (2001)
- viii) Stephens (2001)
- ix) Bloxton (2002)
- x) Finn et al. (2002)
- xi) Joy (2002)
- xii) Drennan and Beier (2003)
- xiii) La Sorte et al. (2004)

Key points from these documents are summarized as follows.

B.1. We begin our review of this latest information with a review of a paper by Beier and Drennan (1997) that was published in *Ecological Applications* Vol. 7, No. 2. This paper reported findings that are similar to Beier (1994), e.g., that goshawks apparently did not select foraging sites based on prey abundance and goshawks selected foraging sites that had higher canopy closure and greater density of trees than other areas studied.

Data from Beier and Drennan (1997) show a mean canopy closure of 48.3 percent on plots used by goshawks with 21 trees per acre (extrapolated from smaller plots) greater than 16 inch d.b.h. In the MRNG, the recommended mean canopy cover within the PFA (minimum of 50 percent within the mature and old age classes) and within the foraging areas (minimum of 40 percent within the mature and old age classes) should approximate or exceed the 48.3 percent cover at foraging sites reported by Beier and Drennan.

B.2. In October 2001, the Northern Goshawk Scientific Committee (NGSC) produced a “Review of Supplemental Information Relevant to Habitat Management for the Northern Goshawk in Southwestern United States” (Reynolds et al.) for the Southwestern Region of the USDA Forest Service. In this document the NGSC reviewed 9 of the 11 papers previously discussed and disclosed in A.7. The NGSC noted that only two of the papers were published in peer-reviewed journals, the other seven consist of an unpublished progress report, agency reports, a thesis, and a published but not peer-reviewed abstract.

The NGSC made the following findings concerning Austin (1993):

1. The study was more applicable to mixed conifer rather than ponderosa pine forests.

2. Home ranges were 22 percent larger than the largest home ranges reported in other North American studies.
3. Findings on habitat use are potentially flawed because of failure to determine or report the degree of location error during radio-telemetry studies.
4. Data support the desired future condition identified in the MRNG in that the MRNG in ponderosa pine call for 20 percent of the home range in trees 100-140 years old, 20 percent of the home range with trees 140-185 years old, and 20 percent of the home range with trees 180-235 years old. Austin recommends this proportion of age classes is expected to provide the large trees with lifted crowns and open understories.

The NGSC made the following findings concerning Beier (1994):

1. The study was conducted in Southwest ponderosa pine forest.
2. Findings are potentially confounded by several factors including whether observed goshawks were actually foraging versus participating in other activities while perching or flying, incorrectly identifying the actual “kill site” by a predator that may stop a number of times on the way to a nest with a prey item, and confusing a “kill site” with the site where a prey was first detected (a critical factor in foraging site selection) by the predator with prey that often move some distances during escape attempts.
3. “Beier’s finding that prey numbers were the same in used and unused sites does not necessarily support his conclusion that goshawks did not pay much attention to prey density” (Reynolds et al. 2001, p 7).
4. In spite of all this, Beier’s finding that goshawks prefer large trees and a diversity of vegetation is consistent with the MRNG (see previous discussion).
5. Beier’s prey census study did not include two important northern goshawk prey items in the southwest—Abert’s squirrel and red

squirrel—potentially confounding the counts of prey in used vs. unused foraging sites.

6. Despite the small sample size, Beier’s data support the MRNG in that foraging goshawks prefer large trees and a diversity of vegetation provided by 20 percent of the home range in trees 100-140 years old, 20 percent of the home range with trees 140-185 years old and 20 percent of the home range with trees 180-235 years old. The NGSC recommended a high level of interspersed structural stages and advocated clumping large old trees with interlocking crowns.

The NGSC made the following conclusion concerning Crocker-Bedford’s 1994 paper: “All topics in the 15 documents reviewed by Crocker-Bedford were effectively addressed by the Scientific Committee in the development of the MRNG” (Reynolds et al. 2001, p 12). However, the NGSC reviewed 3 of 15 pre-1992 documents cited by Crocker-Bedford that were published in peer-reviewed journals.

Hogland (1964) (Crocker-Bedford p 20), which was published in a German journal, reported juvenile goshawks dispersed >30 miles from nest sites in Sweden. Because the NGSC recommended implementing the MRNG in landscapes, adequate habitat should be available for dispersing juveniles.

Kostrzewa (1987) (Crocker-Bedford p 10), also in a German journal, reported, in a study area containing only 16.4 percent forests, goshawks nested further from openings than other hawks in Germany. In an effort to prevent southwestern forests from becoming fragmented, the NGSC recommended overstory canopy cover up to 70 percent (MRNG p 7, Table 1; p 16) with openings no larger than 2 acres in size, no greater than 200 feet across.

Shuster (1976) (Crocker-Bedford, p 40 Table 1) reported on nesting density of goshawks in Colorado. According to Crocker-Bedford, Shuster found 3 pairs of goshawks per 10,000 acres in areas of Colorado where there was little timber harvest and as timber harvest increased, the number of goshawk nests per 10,000 acres decreased. Nesting density was not discussed in the MRNG; however, NGSC concluded studies of goshawk nest densities often lacked pre-timber

harvest controls, and nest densities are likely to differ among localities, forest types, and years, making comparisons equivocal.

The NGSC made three conclusive statements regarding the Crocker-Bedford (1995) paper and the goshawk guidelines:

1. The MRNG recognized that logging probably affects goshawks.
2. A 12-year study of nesting goshawks on the North Kaibab Ranger District identified 102 territories (Reynolds et al. 2003) indicating that the goshawk population there may not have declined.
3. The NGSC noted that Crocker-Bedford (1994 and 1995) was considered during the development of the MRNG.

The NGSC made the following findings regarding the consistency of findings in Hargis et al. (1994) with the MRNG. Hargis et al. (1994) concluded that, within the home range of the goshawk emphasis should be placed on creating or maintaining vegetation diversity, retaining mature timber around permanent water sources and along forest-open edges, and ensuring that a portion of the range provides forest stands that have structural attributes similar to those found at the nest site for each particular geographic area.

The NGSC made the following findings concerning Mannan and Smith (1993):

1. The Mannan and Smith study included only ponderosa pine and mixed conifer forests.
2. Home ranges were intermediate in size to those reported in other studies.
3. The authors were only able to study goshawk use/avoidance of canopy cover categories and they were unable to partition their canopy cover categories and not forest age classes.
4. The determination of use or avoidance of “edge” in the study appeared confounded.
5. Canopy cover diversity was consistent with the MRNG.

6. Overall Mannan and Smith findings support the MRNG for 40-60 percent canopy cover in ponderosa pine and 60-70 percent in mixed conifer. They also stated the distance to edge that Mannan and Smith reported is equivocal.

The NGSC made the following findings concerning Snyder (1995) as it relates to the MRNG:

1. The MRNG did not address Madrean evergreen forest.
2. Canopy cover recommendations in the MRNG are consistent with Snyder’s findings.
3. The MRNG did not address Mearns quail (a common prey species in Madrean forests) as a prey item.
4. Extensive searches for goshawk nests are required before population trends can be established.
5. Snyder’s report is supportive of the desired forest conditions found in the MRNG because of diversity of vegetation that goshawks utilized in the study area.

The NGSC made several findings concerning Titus et al. (1994), however, these findings are not reported here because the extreme differences in habitat between Southwest ponderosa pine forests and forests in southeastern Alaska make comparisons to the MRNG difficult, if not impossible.

The NGSC made the following findings concerning Woodbridge and Detrich (1994):

1. The forest types in the Woodbridge and Detrich study are similar to southwestern forests.
2. The NGSC prevented extensive fragmentation of forests by tree harvests as was the case in the Woodbridge and Detrich study area.
3. The NGSC also recognized the importance of nest areas, nest sites, and nest trees for breeding goshawks.

4. Some of the findings are not pertinent because implementation of the MRNG do not result in large-scale fragmentation and, therefore, do not suggest amending the MRNG.

In summary, the NGSC found the new information in the nine cited papers supported the MRNG and none of the new information warranted amending the MRNG.

B.3. Reynolds et al. (2003) is a progress report concerning the long-term northern goshawk study on the Kaibab Plateau in northern Arizona. The study has four objectives related to goshawk habitat management: (1) Identify the distribution, density, vital rates and genetic structure of the northern goshawk population on the Kaibab Plateau; (2) identify factors such as habitat, food, predators, competitors, short- and long-term weather patterns, and interactions among these factors that are limiting the population of goshawks on the Kaibab Plateau; (3) identify the effects of forest management on both the vital rates of the Kaibab Plateau goshawk population and on each of their population limiting factors limiting the goshawk population; and 4) identify habitat elements that differentiate high quality from low quality habitat by investigating the relationship between the long-term demographic performance of individual goshawks on territories and the landscape-level composition and structure of the habitat within their territories.

One hypothesis being tested is that goshawk reproduction may be affected as much by food abundance as by habitat structure. The food abundance hypothesis is based on the idea that increased primary forest productivity during wet years results in abundant foods (mast seeding, insects), increased populations of birds and mammal prey, and increased breeding by goshawks.

Reynolds et al. (2003) reported “Goshawks on the Kaibab Plateau have a high annual fidelity to their territories” (p 6). And, “Overall, 95% of males and 94% of females remained on their original territories from one year to the next” (p 6). Furthermore, “Failure of a nest attempt in a previous year had little influence on either territory or mate fidelity” (p 7). They concluded, “These data, when coupled with estimates of adult survival, fidelity, and dispersal, suggest that competition for breeding

territories on the Kaibab may be high as a direct result of a saturated breeding population” (p 8).

Reynolds et al. (2003) also reported, “On higher quality territories, the amount of deciduous vegetation and forest openings increased with distance for circle plots; whereas, proportions of these habitats decreased with distance from random locations” (p 9). And, “The number and size of openings within a goshawk’s territory and foraging range are, therefore, important to the goshawk’s reproductive success” (p 10).

In summary, Reynolds et al. (2003) pointed out, “The evidence is mounting that prey abundance varies in response to variations in forest productivity (e.g., cone crops, understory plant production) and short- and long-term weather patterns (wet vs. dry periods)” (p 10).

B.4. In an April 10, 2003, paper, Crocker-Bedford updated his previous 2001 literature review on “Habitat Effects on Northern Goshawks,” citing a number of authors who support the position that goshawk nest sites include larger trees and denser overstory canopies than the surrounding landscape. Also cited were Beier and Drennan (1997), and Good (1998), to make the point that goshawk foraging areas are composed of stands of larger trees, dense overstories, and fewer shrubs and saplings and they found no association between foraging locations and the actual density of potential prey.

In summary, Crocker-Bedford (2003) stated, “Up to some point, larger stands of mature forest are better for both nesting and foraging than smaller stands (a few studies).” And, “Although individual goshawks are not everywhere obligates of mature forests, such habitat may be important for the survival of the species” (p 3).

B.5. On January 9, 2004, Reynolds produced a report, “Is the Northern Goshawk an Old-growth Forest Specialist or a Habitat Generalist?” based on a review of over 180 documents, including peer-reviewed publications, theses, reports and draft manuscripts related to the northern goshawk, that may have had information on how goshawks used habitats during the breeding and winter seasons.

The following statements are from the “Findings and Synthesis” section of Reynolds (2004):

1. Clearly, both nesting and foraging goshawks use nearly every forest and woodland habitat type that occurs within the hawk's geographic range.
2. The diversity of vegetation types within the home ranges of goshawks increased with increasing distance from the nest.
3. Even within nest areas themselves, the habitat structure was variable depending on forest type.
4. In territories lacking old forests, goshawks nest in mid-aged forests.
5. Only one report found that goshawks extensively used old-growth forests versus other forest age classes.
6. The high density of goshawks on the Kaibab Plateau (a disturbed habitat) strongly suggests that goshawks are not old-growth obligates. This does not mean that goshawks avoid old growth or do not use old growth: it simply shows that goshawks can live and reproduce in forests other than old growth.
7. Much of the variation in habitats used appears to be related to the local availability of habitats in combination with an apparent opportunistic nature of goshawks.
8. During the breeding season, nesting goshawks are energetically limited to a finite space surrounding the nest.
9. During winter, when goshawks are not so space limited, their wider range allows them to use a greater variety of habitats.
10. Goshawks may prefer certain habitat compositions and structures to others and may, therefore, not use habitats within their home ranges in direct proportion to each habitat's occurrence.
11. The sum of evidence reviewed argues much of habitat use by goshawks appeared to be related to differences among habitats, in prey abundance and prey availability. Thus, goshawks may nest, or forage, more

often in habitats, or mixes of habitats, where prey is more abundant. Much of the diversity of vegetation types and conditions used by goshawks appears to be related to the diverse habitats that many prey species of goshawks use although there is some contrary evidence of this perspective.

12. Clearly, goshawks are opportunistic; they use a wide variety of habitats and take whatever prey presents itself provided they can detect and pursue it.

13. A high interspersed of prey habitats probably benefits the energetics of foraging goshawks by providing an overall greater diversity of prey species and reduces the travel time between patches of foraging goshawks.

In conclusion, Reynolds (2004) noted, "Goshawks breed in most forest and woodland types that occur in their geographic range... and in some localities in open shrub, tundra, or riparian areas... where they nest in small patches of trees but hunt in the open." And, "Much of the diversity of vegetation types used by goshawks may be related to the availabilities of different prey species in each of those vegetation types" (p 6).

The above conclusions support Reynolds, et al. (1992) and Reynolds et al. (1996) findings that northern goshawk habitat conservation plans should include goshawk (nesting, foraging) and the habitats of all major prey species in a local goshawk food web. While some authors have argued goshawks require closed canopy, mature forest for nesting and foraging, research is increasingly showing that goshawks use a variety of forest and woodland types and age classes and, in some areas, hunt extensively in openings and in edges along openings (Reynolds 2004).

B.6. In 2004, The Wildlife Society released Technical Review 04-1 "The Status of Northern Goshawks in the Western United States," Anderson et al. (2004). The Raptor Research Foundation Inc. and The Wildlife Society jointly formed a technical review committee to: (1) determine if there is evidence of a population trend in northern goshawks in the western U.S., excluding Alaska; (2) determine if there is evidence that goshawks nesting in the eastern and western United States represent distinct, genetically unique populations;

and (3) evaluate evidence for northern goshawk habitat relationships, including any association with large, mostly unbroken tracts of old-growth and mature forests.

Charge number three is at the heart of the Southwestern United States goshawk habitat debate. The Wildlife Society committee concluded, “Given the current knowledge of goshawk-habitat relationships, it is not scientifically defensible to solely use the distribution and abundance of late-successional forest as a surrogate measure to infer goshawk status, population trend, and habitat quality” (Anderson et al. 2004, p 18).

B.7. As with the 11 papers noted in A.7., the following 13 papers are variously cited as supporting the argument that the northern goshawk is a habitat specialist that requires mature or old forest with large trees and dense canopies in both the nesting stand and the foraging area. Further, goshawks avoid open areas and young stands, and that harvesting reduces occupancy and ultimately population density.

B.7.i. Patla (1997) studied a population of northern goshawks for 6 years from 1989 to 1995 on the Targhee National Forest in eastern Idaho and western Wyoming. The study included 31 territories located in Douglas-fir and lodgepole pine and focused on nesting habitat over large areas, and the effects of timber harvesting on both habitat and reproductive success. The most common harvest method was clearcutting. Patla evaluated five spatial scales: the nest tree, nest plot, nest area, post-fledgling family area and the forage area. Her study area consisted of steep mountainous terrain in the upper Snake River basin. Vegetation included sub-alpine fir, Engleman spruce, whitebark pine, Douglas-fir, quaking aspen and lodgepole pine.

Patla found 27 of the 31 territories were occupied at least once during the study. Sixty-four percent of nest territories had some timber harvest while 35 percent were undisturbed. Patla found significant differences in productivity between years with weather being the dominant factor. The study found five prey items dominated the diet of the northern goshawk: snowshoe hare, Uinta ground squirrel, ruffed grouse, blue grouse, and red squirrel. One male goshawk fed almost exclusively on ground squirrels. Patla’s observations were very similar to Fischer’s (1986), “I observed goshawks hunting ground squirrels in open areas of grass or sage

meadows at three different locations” (Patla 1997, p 43). Patla found that sage/shrub cover in the foraging area was positively correlated with occupancy of the goshawk territory. The study results suggest the importance of sage/shrub cover in providing consistent foraging opportunities for northern goshawks. She also found that occupancy rates of pre-harvest nesting territories were higher than post-harvest territories but the differences were not significant.

Patla concluded, within the PFA and FA, the MRNG recommendation for retention of 60 percent cover in mid-aged, mature and old forest stands (20 percent in each category) were very close to the average proportion of total mature forest cover found within estimated goshawk PFAs and FAs on the Targhee National Forest.

B.7.ii. In a 1997 paper, Widen reported on broad scale goshawk population trends and status in Fennoscandia, as well as habitat needs and preferences. Widen (1997) concluded, goshawk populations in Fennoscandia have declined 50-60 percent from the 1950s to the 1980s. During the same time, roughly 40 percent of the forested land had been cleared. Widen cited his 1989 study which found goshawks strongly preferred large patches and mature forest. However, “large patch” was not defined. Widen also concluded, hunting habitats are more crucial than nesting habitats.

B.7.iii. Good (1998) monitored eight male goshawks during the summers of 1996 and 1997 on the Medicine Bow National Forest in south central Wyoming. Vegetation was dominated by lodgepole pine with Douglas-fir, subalpine fir, limber pine, ponderosa pine and quaking aspen comprising the rest of the tree component. Good looked at four factors that affect relative use of goshawk kill areas: (1) prey abundance, (2) habitat characteristics, (3) landscape patterns, and (4) habitat needs of prey species.

Good (1998) found that on average goshawks did not return more often to sites with greater prey abundance. Goshawks returned most often to sites with gentler slopes, fewer ground shrubs, greater density of trees 23 cm d.b.h., and sites dominated by lodgepole pine adjacent to clearcuts with inclusions of small openings. Good also found that goshawks did not return frequently to sites with greater canopy coverage but made kills in a wide range of habitat structure.

B.7.iv. Based on data collected from 1991 through 1996, Reynolds and Joy (1998) reported on the distribution of nesting pairs, annual proportion of pairs laying eggs, nesting success, fecundity, fledgling sex ratio, mate and territory fidelity, and natal and breeding dispersal of goshawks on the Kaibab Plateau in Northern Arizona. They also provided an estimate of the minimum number of monitoring pairs necessary to accurately determine occupancy rates, production of fledglings and nesting success to be 40 pairs.

From 1991 through 1996, Reynolds and Joy banded 429 goshawks in the study area including 86 males, 87 females and 256 nestlings. Brood size ranged from 1 to 3 nestlings and annual nesting success ranged between 72-86 percent. The sex ratio of broods was 54.3 percent female and 45.7 percent male. Reynolds and Joy (1998) found 107 nest territories which they estimated to be 73 percent of the potential territories on the Kaibab Plateau.

In conclusion, they noted in spite of low male survival, there is evidence that the goshawk population on the Kaibab is both saturated and relatively stable and the high annual rate of occupancy of territories by goshawks is suggestive of a saturated population. Reynolds and Joy (1998) also suggest that to determine goshawk fecundity would require a sample size of between 80 and 100 pairs.

B.7.v. Lapinski (2000) reported on a master's study she conducted on goshawk nest production and habitat use for 4 years beginning in 1996 and ending in 1999. Lapinski found 36 active historic nests and captured and placed transmitters on 6 adult goshawks including 1 male. The study was conducted in the Upper Peninsula of Michigan.

Lapinski found nest success to be 1.14 young fledged per year with a predation rate of 25 percent. Based on a personal communication, she speculated that fisher predation may be facilitated by reductions in continuous cover of mixed hardwood-conifer forests. She found that goshawks neither selected nor avoided a variety of habitat types in the Upper Peninsula of Michigan other than a selection for hardwood cover types. She also found that prey availability (ruffed grouse and snowshoe hare) was an important part of habitat selection by goshawks. Home ranges of goshawks

in the Upper Peninsula of Michigan were smaller than those in the West.

B.7.vi. Boal et al. (2001) studied goshawks in Minnesota for 3 years from 1998-2000. Habitats included hardwood and conifer forests consisting of aspen, paper birch, red oak, white pine, and red pine. Boal et al. classified stands as young 0-25 years, mature 25-50 years and old <50 years. Boal et al. located 53 nest areas and radio tagged 33 adults (18 males and 15 females). Eighty-one percent of the nests were in aspen, 11 percent in paper birch and 4 percent in white pine. Fledgling success was 1.75 young per nest. Boal et al. found early successional upland hardwoods were the most common habitat type for foraging goshawks. Mature early and mature late successional upland conifers were preferred for breeding. Goshawk home ranges also had high levels of downed wood, high stem densities, dense canopies and unobstructed lower canopies.

B.7.vii. Ingraldi (2001) studied northern goshawks for 7 years on the Apache-Sitgreaves National Forests in east-central Arizona. The study had three purposes: (1) estimate adult and post-fledgling survival rates; (2) estimate percent of nests active, active nests that produce young, primary sex ratio, and fledgling per nest; and (3) model the status and population trend of northern goshawks on the Apache-Sitgreaves National Forests in east-central Arizona.

Vegetation in the study area is typical of the Mogollon Rim, dominated by mixed conifer, ponderosa pine, white fir, aspen and gamble oak. Ingraldi found over the 7-year period, mean territory activity rate was 48 percent with a mean failure rate of 31 percent. Ten territories produced 52 percent of the young. Mean fecundity rate was 46 percent. Ingraldi noted occupancy rate was a poor indicator of population status while the number of fledglings per active nest was a much better indicator of population performance. Finally, Ingraldi (2001) noted although some territories were attractive for nests they were not suitable for producing young.

B.7.viii. Stephens (2001) studied the wintering ecology of northern goshawks for two seasons (1998/99 and 1999/2000) in the Uinta Mountains in northern Utah. The predominant vegetation in the study area included spruce-fir, lodgepole pine, ponderosa pine, Douglas-fir and pinyon/juniper woodlands. Stephens radio tagged 18 goshawks (7

male and 11 female). Stephens found 40 percent of marked males and 90 percent of marked females migrated during winter. Most goshawks migrated to lower elevation pinyon/juniper woodlands which he called an important wintering ground. Goshawks also used agricultural areas, sagebrush and cottonwood riparian forests during winter. Stephens also measured several habitat parameters: canopy closure, tree density, tree height, tree diameter, sapling density, shrub density and slope. Stephens found lodgepole pine and mountain fir were selected in higher proportions than their availability in the study area. Oak, ponderosa pine and lowland riparian were also present in higher percentages than in the study area. Stephens noted wintering goshawks selected forested landscapes with high canopy closure both during the day and at night.

B.7.ix. Bloxton (2002) studied northern goshawks from 1996-2000 in managed forest settings in western Washington during the breeding season. Bloxton looked at prey abundance, space use and demography. Eight of the nine territories used to assess special use occurred on intensively managed private forest lands. Bloxton radio tagged 29 goshawks and monitored 23 territories to determine occupancy and reproductive success. Bloxton found weather during La Nina years had a significant effect on prey availability, habitat use and mortality of goshawks. Bloxton determined blue and ruffed grouse, band-tailed pigeons, northern flying squirrels, snowshoe hares and Douglas' tree squirrels dominated goshawk diets.

Bloxton documents goshawks successfully hunting in all forest types and successional stages except recent clearcuts and shrub/sapling stages. However goshawks tended to hunt in stands with larger diameter trees even though kills were recorded in everything from open 13-year-old regeneration units to 200-year-old growth stands. As such there was substantial variation among kill sites.

B.7.x. Finn et al. (2002) studied breeding ecology and habitat use by northern goshawks in western Washington from 1996 through 1998. Finn et al. found 12 of 30 historic sites to be occupied. They classified habitat by LANDSAT imagery including six forested habitats and three non-forest habitats. Finn et al. (2002) noted, goshawks appeared to respond to habitat features at a variety of spatial scales and habitat configurations. They found that landscapes surrounding occupied nest sites were

dominated by late-seral forest and to a lesser degree by mid-seral forest. Nest sites had large uniform tree patches. The percent of stand initiation cover (trees less than 7 years old) increased as spatial scale increased. At nest stands, stand initiation cover increased to a maximum of 17 percent. Finn et al. (2002) found goshawks nested in mature forest stands (trees older than 40 years) surrounded by late seral forest. Finn et al. (2002) also concluded that goshawk needs at large scales can be met in a variety of ways that may be compatible with the needs of other species or that allow managers to balance biological and economic objectives.

B.7.xi. Joy (2002) developed a dynamic model aimed at predicting goshawk nesting habitat. The study area was the North Kaibab Ranger District in Arizona. Joy also assessed the relationship between abundance, distribution and demographic performance of goshawks and the range of habitat conditions supporting the population. Joy (2002) stated, "because of the nesting requirements of the goshawk, the vegetation types associated with nest-tree plots are not likely to be in proportion to those observed on the study area outside of the nest areas" (p 24). Joy also found the most common habitat variables distinguishing goshawk territories were the amount and arrangement of ponderosa pine, mixed conifer, deciduous trees, openings, and overall diversity of vegetation types. Joy showed that higher quality goshawk territories contained smaller and fewer openings than random plots.

B.7.xii. Drennan and Beier (2003) studied 13 adult wintering goshawks for 2 winters (1994-1995 and 1995-1996) and found most female goshawks stayed near their nesting territory while male goshawks moved to lower elevation pinyon-juniper areas. Wintering male goshawks preyed on cottontailed rabbits and Abert's squirrels. They also found when selecting a foraging site within a home range and habitat type, goshawks selected sites in moderately dense, mature forests where they could use their maneuverability to capture prey. They also noted this pattern was consistent during the breeding season.

B.7.xiii. La Sorte et al. (2004) studied habitat associations of sympatric red-tailed hawks and northern goshawks at two spatial scales around nest sites during the breeding season. The study occurred on the Kaibab Plateau in northern Arizona.

La Sorte et al. found red-tailed hawk nests were located on steep north slopes, containing abundant shrubs. Red-tailed hawk nests were also higher in the tree than goshawk nests and had less overhead cover. Conversely, goshawk nests had higher overhead cover, little understory shrubs, and were lower in the canopy with no aspect affiliation. The investigators concluded that their results were consistent with other studies that documented goshawks nesting in areas of high canopy closure, mature trees and open understories which corresponds to the management of a post-fledgling family area outlined in Reynolds et al. 1992.

C. Finally, this review is based on the following recent documents, developed since the draft supplement to the final environmental impact statement was published.

1. Two papers published in 2005, titled “Sampling Considerations for Demographic and Habitat Studies of Northern Goshawks” and “Patterns of Temporal Variation in Goshawk Reproduction and Prey Resources.”
 - i) Reynolds et al. (2005)
 - ii) Salafsky and Reynolds (2005)
2. Four “in press” papers received by the Forest Service in 2005.
 - i) Reynolds et al. (in press, a)
 - ii) Reynolds and Joy (in press)
 - iii) Reynolds et al. (in press, b)
 - iv) Wiens et al. (2006)
3. A recent paper by Greenwald et al. (2005), titled “A Review of Northern Goshawk Habitat Selection in the Home Range and Implications for Forest Management in the Western United States” and a response to this paper by three of the MRNG primary authors.
 - i) Greenwald et al. (2005)
 - ii) Reynolds et al. (in review)

Key points from these documents are summarized as follows.

C.1.i. In their paper titled “Sampling Considerations for Demographic and Habitat Studies of Northern Goshawks,” Reynolds et al. (2005) reported on the

results of 12 years of goshawk nest monitoring on the North Kaibab. Reynolds et al. used mark-recapture methodology from 1991-2002 to determine distribution, vital rates, abundance, fidelity to mate and nest territory, natal and breeding dispersal, and habitat occupancy of breeding goshawks. The number of known breeding territories increased from 37 in 1991 to 121 in 2002. By 2002, about 95 percent of the Kaibab National Forest had been searched. They defined a breeding territory as an area exclusively occupied by a pair of goshawks during a breeding season. Using this method, Reynolds (unpublished data) found that paired goshawks had strong site fidelity to their breeding territory. They located territories using two protocols: systematic foot searches for goshawks and their nests and broadcast vocalizations from stations along transect lines.

Reynolds et al. (2004) reported that over years, goshawks often have alternative nest sites. To ensure the best possible results they employed a within-territory nest search protocol. Nests were “used” if eggs were laid, or eggs were not laid but evidence of occupancy was obvious. They found that there was large temporal variation in the frequency of egg laying, some pairs going 7 years between laying events. On average 63 percent of the nests were successful. There were 273 alternate nest sites in 91 territories. Annually 64 percent of the breeding population used alternate nest sites. Sample sizes of 60-80 territories in good years and 80-100 territories in bad breeding years were necessary to gain adequate estimates. In summary, their study showed that, because breeding varied temporally and spatially and detectability of nonbreeders was low, accurate estimates of the numbers of nests and nest location greatly depends on the sampling effort. Reynolds et al. (2005) recommend a minimum of 8 years of searches to adequately sample an area for occupancy of breeding territories.

C.1.ii. Salafsky and Reynolds (2005) studied goshawk productivity in relation to prey base productivity and abundance in an effort to determine if prey availability limited goshawk productivity. The study was conducted on the Kaibab Plateau in northern Arizona. Their objectives were to determine if prey resources limit the reproductive rates of goshawks with relatively diverse diets, and describe how changes in prey populations may influence goshawk productivity. If

prey was limiting then variations in productivity should be associated with variations in prey abundance. Salafsky and Reynolds (2005) found variation in both goshawk productivity and prey density across sampling year, with goshawk productivity taking a significant decline between 2000 and 2001 which correlated with significant declines in prey density during the same time period. Goshawks were found to consume a wide variety of prey items 710 from 30 individual prey species. Seven species made significant contributions to goshawk diets. They found a strong positive correlation between total prey density and goshawk productivity from 1999-2002. Red squirrel was the only prey species found to have a significant positive relationship with goshawk productivity. Since this species does not hibernate it remains available year-around.

Salafsky and Reynolds (2005) found high temporal correlations between goshawk productivity and annual prey densities. They state “Therefore it appears that goshawk reproduction on the Kaibab Plateau responded to inter-annual increases in prey density” (p 243).

C.2.i. In their as yet unpublished paper titled “An Ecosystem-Based Conservation Strategy for the Northern Goshawk,” Reynolds et al. (in press, a) describe the process they used to develop Southwestern goshawk conservation strategy¹ (SWGS), described the potential for its broad application in western forest landscapes, describe its compatibility with the restoration of ecological forest processes, and summarize implementation. The SWGS is based on describing desired habitat conditions based on the life history and habitats of the northern goshawk, the life histories and habitats of its primary prey, and the ecology and dynamics of the forests it inhabits. The premise is that a conservation strategy that addresses all the stages of a species’ life history, the physical and biological factors that limit its populations, the members of its ecological community, and the special and temporal dynamics of the ecosystem it occupies, should be robust to failure. They review goshawk life history, goshawk limiting factors, goshawk habitat, goshawk prey, geographical and annual variation in goshawk diets, determine goshawk diets, develop suites of important prey species, prey habitats, forest

ecology and synthesis of these components. From here they review the development and implementation of vegetation structural stages or VSS classes. Concerning the implementation of the SWGS they note, “Specific management actions and the intensity that they are applied should be contingent on the differences between the existing conditions of a focal area and the desired conditions” (Reynolds et al. in press, a, p 18).

Reynolds et al. (in press, a) also note, “The desired forest conditions described in the SWGS resembled the historical conditions of southwestern ponderosa pine forests described by Pearson (1950) and White (1985). These similarities suggest that implementing the SWGS would move forests toward restoration of presettlement conditions” (p 21). They also describe the SWGS as a multi-species strategy because it was based on the habitats and ecological relationships of many plant and animals in the goshawk food web.

C.2.ii. In a publication titled “Demography of Northern Goshawks in Northern Arizona, 1991-1996,” Reynolds and Joy (in press) document a study of 282 goshawk nesting attempts on 107 territories on the Kaibab Plateau in northern Arizona from 1991-1996. As a result of the study they report on the distribution and density of breeding pairs, inter-annual variations in proportions of pairs breeding and reproduction, fledgling sex ratios, territory fidelity, and survival of adult goshawks. This study presents the first 6 years of a 15-year study.

Reynolds and Joy found that all but 2 of the 107 territories contained active nests in 1 or more breeding seasons, and the annual percentage of nests failing did not differ significantly between years (14-28 percent). The mean number of fledglings produced and successful nests declined from the better breeding years of 1991-1993. Of 282 nesting attempts in which eggs were laid, 46 (16 percent) were known to have failed. Combining years there were 126 females (54.3 percent) and 106 (45.7 percent) males from 125 broods. Because they had surveyed a high percent of the national forest and the Grand Canyon National Park, Reynolds and Joy were able to determine that the 107 known nesting territories comprised about 73 percent of the potential nesting population in the study area. Of the 105 territories that layed eggs 56 percent contained more than 1 nest, 41 percent

¹ The Southwestern goshawk conservation strategy (SWGS) is synonymous with the MRNG.

more than 2 nests, 12 percent had 3 alternate nests, and 4 percent more than 4 alternate nests.

Annual turnover of adults on territories varied from 10-40 percent for males and 0-50 percent for females. Both male and female breeders showed high fidelity to nesting territories. Survival rates for males were constant at (0.69) and for females at (0.87). They also determined that goshawk territories on the Kaibab Plateau are spatially and temporally fixed.

C.2.iii. In their as yet unpublished paper titled “A Review and Evaluation of Factors Limiting Northern Goshawk Populations,” Reynolds et al. (in press, b) conducted a literature review for factors potentially limiting goshawk populations. They also evaluated the relative importance of the potential limiting factors and discussed how and what scale these factors operate to limit goshawk populations. Reynolds et al. (in press, b) evaluated goshawk behavior, food, vegetation composition and structure, predators, competitors, disease, and weather. They limited their review to factors affecting goshawk reproduction and survival.

Their evaluation of territoriality showed that it can constrain breeding populations by limiting the number of breeding individuals, however, variations within and among landscapes may vary greatly thus effecting the spacing of breeders across any given landscape. Limiting factors concerning vegetative composition were investigated for both the nest and foraging areas. Based on their review, they determined that structure in nest stands is more important than tree species composition. Reynolds et al. (in press, b) report that while many studies implicitly or explicitly point to mature and old forest as important to goshawk occupancy and reproduction, none determine whether or how goshawk actually use any of the vegetation types or seral stages found in circular plots.

Reynolds et al. (in press, b) challenge the conclusions on foraging areas reported by Beier and Drennan (1997), Drennan and Beier (2003) and Good (1998) by stating, “We believe, however, that inference about choice of hunting habitat based on foraging/kill site data are equivocal for several reasons. First the presumed foraging/kill sites may not have been the sites where a goshawk first detected the prey... Second, goshawks frequently move their prey after killing it... Third, studies using indices of prey abundance fail to account for

variation in bird and mammal detection probabilities due to among-plot difference in vegetation structure” (Reynolds et al. in press, b, p 13 and 14). They conclude that the idealized home range contains a diversity of vegetation types and seral stages, including small openings, to provide the habitats of the goshawk’s diverse suit of prey (Reynolds et al. 1992).

Based on their review of prey availability Reynolds et al. (in press, b) conclude that the density, physiological condition, and survival of goshawk fledglings, juveniles and adults appears to be directly related to food availability. Therefore, it is an important and ubiquitous factor limiting goshawk reproduction and survival.

In their summary, Reynolds et al. (in press, b) point out that no study to their knowledge quantified a direct relationship between goshawk survival and vegetation composition and structure, either in breeding habitats or in winter habitats, although some evidence suggests that predation on goshawks may be higher in non-forested habitats. They also note that considerable evidence suggests that vegetative structure at nest sites and foraging sites and the abundance and availability of food were the primary factors limiting goshawk reproduction and survival. The strength of these conclusions are likely to depend on factors such as the number of species within the prey base, whether or not prey populations fluctuate in synchrony, spatial variation in composition and structure of vegetation and abundances of predators and competitors.

C.2.iv. In their as yet unpublished paper titled “Post-fledgling Survival of Northern Goshawks: The Effects of Prey Abundance, Weather, and Dispersal,” Wiens et al. (2006) investigated post-fledgling and post-independence survival of 89 radio marked juvenile goshawks produced from 48 nests in northern Arizona from 1998-2001. The overall goal was to identify critical periods of post-fledgling survival and to determine what ecological factors are most strongly limiting to goshawk productivity at the level of juvenile survival. Specifically they addressed age, gender and cohort specific survival rates, the relative importance of environmental factors to survival and to estimate the importance of fledging and post-independence on juvenile survival rates.

Wiens et al. (2006) tracked 41 of 89 juveniles until they recovered the radio or found the bird dead. They recorded eight mortalities (five females and three males) during the fledgling dependency period. Based on evidence found at the recovery sites, three died from predation or injuries attributable to predation, three from starvation and two unknown causes. By week 13 they were only able to detect 15 of 64 remaining radio-marked juveniles. An additional 6 mortalities (4 females and 2 males) occurred during the 5-week period following independence whereas 10 mortalities (7 males, 3 females) occurred between weeks 13 and 40 post-fledgling. A total of 24 hawks were recovered dead during the study, with predation accounting for 46 percent of the mortality.

Wiens et al. (2006) concluded that post-fledgling survival of juvenile goshawks was consistently high among years and most strongly related to fledgling age, annual changes in prey abundance, gender related difference in body condition. Contrary to predictions they found no evidence that heavy precipitation affected juvenile survival.

C.3.i. Greenwald et al. (2005), conducted a literature review of all published and unpublished North American telemetry-based studies within-home-range habitat selection by northern goshawks. They only considered radio telemetry studies of habitat selection because in their words “such methodology represents the sole means to collect a relatively unbiased sample of locations for a wide-ranging predator like the goshawk, allowing statistical comparison of habitat use verses availability” (p 121). Greenwald et al. (2005), reported that 9 of 12 studies demonstrated selection for stands with higher canopy closure, larger tree size and greater numbers of large trees than found in random sites. Selection for stand diversity was inconclusive. However they reported that, “There was great variation in stand vegetation diversity among the studies” (p 123). They further noted that most studies found that goshawks avoided openings and logged early seral stands. They also reported that four studies determined that goshawks did not select stands for prey abundance. Goshawks in winter continued to select stands with higher canopy closure. They cite five studies that suggest that timber harvest reduces occupancy. They rejected the assumption that foraging goshawks use habitat opportunistically. They also conclude that food availability was not found to limit goshawk productivity in occupied territories.

Greenwald et al. (2005), concluded by stating, “In sum, based on apparent inconsistencies between subsequent research and Reynolds et al. (1992), we recommend adaptation of the management guidelines to incorporate results of numerous studies conducted since 1992” (p 128).

C.3.ii. In this unpublished paper titled, “Habitat Conservation of the Northern Goshawk in the Southwest United States: Response to Greenwald et al. 2005,” three of the primary authors of the southwest goshawk management guidelines respond to Greenwald et al. (2005). They begin with “Here we show that Greenwald’s et al. (2005) conclusion derives from misunderstandings of the desired habitat conditions described in the MRNG, a poor understanding of the ecological factors limiting goshawk populations, a failure to understand goshawk forest habitat as dynamic ecosystems, incomplete reviews of the literature, and inclusion of studies with limited samples of goshawks” (Reynolds et al. in review, p 1 and 2). While Greenwald et al. (2005) insist that mature to old-growth forest are necessary for goshawks, Reynolds et al. (in review) answer with “The literature on prey life histories and habitats indicated that mid-aged to old forests were the most important habitat for most goshawk prey species followed in importance by small open areas (Reynolds et al. 1992)... Thus, MRNG desired landscapes had as much old forest with small interspersed openings as could be sustained” (p 2 and 3). The mosaic of vegetation structural stages (VSS) outlined in the MRNG resemble the pattern of presettlement ponderosa pine in which trees were strongly aggregated into groups of 3-44 trees occupying 0.2-0.3 ha (Cooper 1961, White 1985). Tree groups, and occasional individual trees, were typically separated by variable-sized, but small openings into which roots of the grouped trees spread (Pearson 1950). Reynolds et al. (in review) further explain their silvicultural and biological rationale by addressing the sustainability of old forest with small openings, which are similar to the patchiness found in presettlement ponderosa pine, with lifted canopies, interlocking branches, extensive shading, with snags, downed logs and woody debris, along with brushy understories.

Reynolds et al., (in review) point out several studies that Greenwald et al. (2005) did not include in their literature review (Drennan and Beier 2003 and Stephens 2001). They note that there are wide habitat differences in goshawk habitat use between

dry pinyon-juniper woodlands and mesic coniferous rain forests in Alaska. Reynolds et al. (in review) conclude, “Such extensive variation in vegetation structure (big trees, little trees, no trees; closed canopy, open canopy, no canopy) leads us to conclude that tree size, canopy cover, canopy layers, and woody debris are not always factors limiting goshawk populations as posited by Greenwald et al. (2005)” (p 6).

In their 2005 response to Greenwald et al. (2005), Reynolds et al. (in review) address the “prey base” habitat issue brought up by the former. They state, “Greenwald’s et al. (2005) suggestion of inadequacy of the MRNG is based on their misrepresentations of the desired habitat conditions for goshawks and their prey described in the MRNG.” Further, “Equating the desired openings described in the MRNG to historical clearcuts is misleading” (p 7). Greenwald et al. (2005) admit openings may benefit ground squirrels, a major item in western goshawk diets, and they also ignore rabbits as a food source.

Next, Reynolds et al. (in review) address the inadequacies of several studies cited by Greenwald et al. (2005). Greenwald et al. did not include all radio telemetry studies as they claim (see Younk, 1996). Also at least 12 studies reviewed by Greenwald et al. (2005) included fewer than 10 radio-tagged goshawks and 1 study included only 2 birds. Because of the lack of a robust sample size in these studies they are unlikely to adequately describe all of the habitats used by goshawks.

Reynolds et al. (in review) then address forest structure and prey abundance. Greenwald et al. (2005) cite four studies that in their view demonstrate that goshawk select for forest structure and not for prey abundance. Reynolds et al. (in review) point out the potential problems with the approach taken in these studies. First is the assumption that radio-located goshawks were actually hunting when located and not involved in some other activity, and that kill sites were indeed the spot where the kill was made i.e. goshawks had not moved their kill. Reynolds et al. (in review) believe that the MRNG provide the best vegetative structure giving access to abundant prey.

Next Reynolds et al. (in review) address the issue of close canopy forests introduced by Greenwald et al. (2005). Reynolds et al. (in review) point out that the five studies cited by Greenwald et al. (2005)

were not specifically designed to test or determine habitat surrounding goshawk nests. Thus, they could only hypothesize concerning goshawk habitat relationships.

Reynolds et al. (in review) then point out numerous studies relating goshawk reproduction to surrounding landscape habitats; La Sorte et al. (2004), Joy (2002), Desimone (1997), Maurer (2000), Clough (2000), Daw and DeStefano (2001) and McGrath et al. (2003). Finally, Greenwald et al. (2005) cited Crocker-Bedford’s (1990) 3-year study in which he reported significantly lower nest occupancy and productivity of goshawks in areas that had been only lightly harvested verses those areas that had been more heavily harvested. However, 15 years of study on the Kaibab Plateau has shown that there is great temporal and spatial variation in goshawk productivity (Reynolds et al. and Reynolds and Joy in press). “While Crocker-Bedford (1990) concluded that heavier cutting reduced occupancy and reproduction compared to light cutting, we show... that demonstrating the effects of tree cutting on reproduction is not always straight forward even with long-term data” (Reynolds et al. in review, p 16).

Therefore, Reynolds et al. (in review) disagree with Greenwald’s et al. (2005) statements that, “recommendations focusing on increasing prey abundance at the expense of forest structure...are not likely to increase goshawk occupancy rates.” And, “The multiple species, ecosystem approach of the MRNG addresses the most ubiquitous factors appearing to limit goshawk populations: Food abundance, food availability, and suitable nest habitat” (Reynolds et al. in review, p 17 and 18).

Discussion on Literature Review

As stated in Anderson et al. (2004), most biologists can agree on managing northern goshawk habitat at three spatial scales: the nest, nest stand and foraging area. The scientific debate has been stated in terms of the degree to which the northern goshawk should be considered a habitat specialist, requiring large tracts of old-growth forest, closed canopies, large trees and, further, that they avoid open areas, young stands, edges and areas with high vegetation diversity.

The contrary point of view is that the northern goshawk is a habitat generalist capable of utilizing a variety of habitats, especially for foraging

(Reynolds, 2004). However, only 1 (southeast Alaska) of the 180 documents reviewed by Reynolds (2004) showed the northern goshawk strictly using old growth.

Proponents of the goshawk specialist theory cite various scientific literature to support their arguments as to habitat requirements or habitats that are avoided or not used by the northern goshawk.

In support of the contention that goshawks require closed canopy (> 40 percent) old-growth forest throughout their home range, proponents variously cite: Austin 1993, Beier and Drennan 1997, Boal et al. 2001, Bright-Smith and Mannan 1994, Drennan and Beier 2003, Hargis et al. 1994, Stephens 2001, Ward et al. 1992, Patla 1997, Finn 2002, La Sorte et al. 2004, Joy 2002, and Ingraldi 2001.

There appears to be no debate that goshawks will use areas of high-canopy closure within their home range, especially in the nest stand. One interesting anomaly here is silvics of ponderosa pine forests. Older ponderosa pine forests, particularly on drier sites found in the Southwest, generally do not provide high levels of canopy closure due to the open nature of their crowns and generous spacing of the trees at older ages (150+ years).

Debate over the amount and extent of old growth or whether the northern goshawk is an old-growth obligate is substantive. Reynolds (2004), points out the wide variety of habitats used by the goshawk for nesting and foraging and questions whether all of these habitats are replete with old-growth forest. Clough (2002), found goshawks nesting in very young stands 17 of 19 times. In their review of the status of the northern goshawk in the western United States, Anderson et al. (2004) concluded, "Given the current knowledge of goshawk-habitat relationships, it is not scientifically defensible to solely use the distribution and abundance of late-successional forest as a surrogate measure to infer goshawk status, population trend and habitat quality" (p 18).

In support of the contention that goshawks require large trees in their home range, proponents cite: Austin 1993, Beier and Drennan 1997, Bloxton 2002, Boal et al. 2001, Good 1998 and Hargis et al. 1994.

There appears to be no substantive debate concerning the use of large trees in the home range of the northern goshawk especially for nesting and perching. However, Clough (2002) found 17 of 19 goshawk nests in open forests with 65 percent of the PFA dominated by small sized trees.

Proponents of the goshawk specialists theory often cite literature in support of their arguments that northern goshawks select habitats that lack edge, vegetation diversity, forest edges, openings in the canopy and they specifically do not select habitats based on prey abundance as follows: Austin 1993, Beier and Drennan 1997, Bloxton 2002, Boal et al. 2001, Bright-Smith and Mannan 1994, Titus et al. 1996, Fischer 1986, Lapinski 2000, Joy 2002, La Sorte et al. 2004, Good 1998, and Drennan and Beier 2003.

Reynolds (2004) points out northern goshawks occupy a wide variety of habitats as documented in the scientific literature including: ponderosa pine with pinyon-juniper woodland stringers, pine-oak woodland, ponderosa pine, Douglas-fir western hemlock, Douglas-fir, mixed conifer, aspen, lodgepole pine, paper birch, beech, hardwood-hemlock, etc.

Widen (1989), Kenward and Widen (1989), Younk and Bechard (1994), as well as Joy (2002), report finding that northern goshawks utilize habitats with relatively high prey abundance and availability. It should also be noted Beier and Drennan (1997), Drennan and Beier (2003), and Good (1998), did not explain how kill sites were located, therefore, it is impossible to tell where the actual taking of prey occurred, especially since various methods yield various results as to habitat associations, Reynolds (2004).

Kenward (1982), Kennedy (1989), Hargis et al. (1994), Titus et al. (1994), Younk and Bechard (1992) and (1994), and Clough (2002), all reported northern goshawks using young stands, forest edges and openings.

Proponents of the goshawk specialist's theory supporting the argument that timber harvesting reduces goshawk nest occupancy, reduces goshawk nesting density and threatens population viability cite: Crocker-Bedford (1990), Crocker-Bedford (1995), Ward et al. (1992), Patla (1997), Finn (2002), La Sorte et al. (2004), Joy (2002), and Ingraldi (2001).

The North Kaibab Ranger District of the Kaibab National Forest has been treating forest stands following the management recommendations outlined in GTR-RM 217, Reynolds et al. (1992), and the Preferred Alternative in the Regional Forest Plan Amendment 1996 for the past 7 years (See Table 5). During that time, they treated an average of 2,719 acres per year averaging 4,994 MBF harvested annually.

Table 5. Timber Harvest on the North Kaibab Ranger District of the Kaibab National Forest

Year	Acres Treated	Volume-MBF
1998	1,143	4,855
1999	7,697	9,137
2000	4,509	7,968
2001	3,116	6,631
2002	1,255	3,838
2003	620	1,163
2004	696	1,386
Totals	19,036	34,960
Means	2,719	4,994

During the same period, Joy (2002) reported that northern goshawk territory occupancy on the Kaibab Plateau remained stable while nesting success varied by year.

Woven into the debate on whether goshawks are old-growth, closed-canopy forest obligates or are opportunists that use a variety of habitats, are great differences in habitats of primary goshawk prey species and the necessary entry of goshawks into these habitats to capture prey.

In their review of the pre-1996 literature (Appendix H) the NGSC concluded the MRNG provided for the foraging needs of the goshawk by providing suitable (and sustaining) foraging habitat (40 percent of the landscape is mature and old forests, and small openings) for both the goshawk and its major prey species.

National Forest Surveys and Monitoring

National forests in the Southwestern Region have been monitoring northern goshawks for over 10 years. Beginning in 1991, a standardized protocol became available for conducting goshawk surveys. This protocol included standard procedures for timing, intensity and duration of goshawk surveys.

The tables displayed in Appendix AM summarize the data from those surveys.

The total number of post family-fledgling areas (PFAs) within the Southwestern Region has steadily increased from 272 in 1991, to 683 in 2004. Over that same period, the individual national forests in the region monitored an average of 333 PFAs per year.

As reported in Reynolds et al. (2003), northern goshawk productivity on many national forests in the region was down during the recent drought. The summarized information is reported by post family-fledgling area. The post family-fledgling area is described on page 13 of the MRNG (Reynolds et al. RM GTR 217, August 1992).

During the 1991 to 2004 time period, volume of timber sold and harvested within the Southwestern Region has steadily decreased (see Table 6). Corresponding monitoring data over the same time period in the region shows that the percent of total PFAs that produced fledglings, percent of total PFAs occupied but didn't produce, and percent of total PFAs with at least one goshawk present has also steadily declined. This data trend is consistent with Reynolds et al. (2003) as described above.

Table 6 Regional Timber Harvest Data (CCF = Hundred Cubic Feet)

Year	CCF Sold	CCF Cut
1988	392.6	485.2
1989	357.4	496.9
1990	305.2	433.2
1991	282.3	344.1
1992	163	291.8
1993	153	190.6
1994	119.1	115.5
1995	85.7	99.6
1996	33.3	46.3
1997	88.9	83.2
1998	43.1	34.9
1999	72	83.7
2000	68.6	65.4
2001	81.3	70.5
2002	65.6	70.9
Total	2,311.1	2,911.8

It is statistically unsound to draw many conclusions on a regional scale from the individual national forest's northern goshawk monitoring data due to a number of factors, including:

1. Forest monitoring protocol was developed before recent literature concluded that more nest site searches are necessary to validate absence or presence (See Boyce, et al. 2005).
2. Variation of data and results among and between forests is wide.
3. There is a wide variety of environmental variables unique to many forests which have influence over the results.
4. As stated in Reynolds et al. (2005), recent research has indicated that necessary sampling efforts to accurately estimate the reproductive status of northern goshawks indicate that current sampling protocols may be insufficient.

Reynolds et al. (2005) report the difficulty of finding and monitoring breeding goshawks determined during 14 years of intensive mark-recapture study of nesting goshawks on 121 territories. This difficulty stems from their elusive behavior, their complex forest habitats, and their annual frequent use of many widely-dispersed alternate nests within their breeding territories. Because not all goshawks breed every year (only breeding goshawks can be detectability with reliability), as many as 8 years of repeated searching is needed to unequivocally classify areas as "unoccupied" by territorial breeding goshawks (Reynolds et al. 2005).

Further, alternate goshawks nests can be further than 1.5 miles apart and between 55-76 percent of goshawks laying eggs in a given year moved to an alternate nest (Reynolds et al. 2005), making the monitoring of goshawk reproduction and other vital rates difficult.

A review of the goshawk literature makes it apparent that few studies of breeding goshawks have been conducted with the necessary sampling effort to make

reasonable comparisons with the densities and vital rates reported on the Kaibab Plateau (Reynolds and Joy in press, Reynolds et al. 2005).

5. Determining the stability of northern goshawk populations, the principal objective of a 14-year study of the goshawk population on the Kaibab Plateau, has proven to be a very complex problem because goshawk populations are affected not only by the availability of forest habitats but also by the availability of food. Each species of goshawk prey is, in turn, affected by the abundance of their habitats, the quality of which varies according to drought versus wet periods (Salafsky 2004).

Summaries and corresponding graphs of monitoring data are displayed for each national forest in the Southwestern Region beginning in 1991 and ending in the 2004 field season in Appendix AM.

Summary Discussion

The Preferred Alternative (Alternative G) implements "Management Recommendations for the Northern Goshawk in the Southwestern United States" (RM-217) as supplemented by management guidelines for Mexican spotted owls developed in response to the "Mexican Spotted Owl Recovery Plan." The recommendations in RM-217 are based on a synthesis of published literature and other data establishing:

- In the southwestern United States, goshawks utilize a variety of vegetation communities including ponderosa pine, mixed species, spruce-fir and woodland.
- Goshawk nest areas, which may include more than one nest, contain one or more stands of large old trees with a relatively dense canopy cover. The size of these nest areas has been noted to be approximately 30 acres. Most goshawks have two to four alternate nest areas within their home range. Alternate nest areas may be used in different years.
- The post fledging-family area surrounds the nest site and typically includes a variety of forest types and conditions. It represents an area of concentrated use by the goshawk

family from the time the young leave the nest until they are no longer dependent on the adult for food (up to 2 months post-fledging). These areas have a variety of forest conditions; however, the vegetation structure generally resembles that found in the nest stands with patches of dense trees, developed herbaceous and/or shrubby understories. All vegetation structures have habitat attributes critical for goshawk prey.

- Goshawks forage in larger areas surrounding the nesting areas. These areas are approximately 5,400 acres in size. There is evidence that goshawks use mature and old forest within these areas more heavily than they use other seral stages. However, goshawks use available habitats (openings) opportunistically which suggests the choice of foraging habitat by goshawks may be as closely tied to prey availability as to habitat structure and composition.

While there is general agreement among scientists on the above points, a handful of papers have been cited as evidence that goshawks require foraging areas containing large, unbroken blocks of old forest. Primary findings in these papers are detailed above in the section titled "Review of Pertinent Information Concerning Habitat Management for the Northern Goshawk."

Some of these papers were cited in the Arizona and New Mexico game agencies' response to the DEIS. That response used the papers, in part, as the basis for an alternative set of recommendations for northern goshawk management that placed more emphasis on large blocks of old forest. Those alternative recommendations are represented in this supplement to the FEIS as Alternative D. Recommendations for nesting and post-fledging areas in Alternative D are virtually identical to the recommendations in Alternative G. Major differences between the alternatives focus on the composition and management of foraging areas. Highlights include:

- Alternative G would manage forested portions of foraging areas on the equivalent of a 200-year rotation. Alternative D would use the equivalent of a 250-year rotation.

- Both alternatives would require 20 percent of the foraging area be composed of VSS 6. Alternative G would count all patches of old-growth, no matter how small, in determining whether the 20 percent was being maintained. Alternative D would require that the VSS 6 be maintained in larger blocks (> 100 acres).
- Alternative G calls for uneven-aged management in the resulting forest structure. Alternative D allows up to 20 percent of the landscape to have even-aged management with the remaining areas using uneven-aged management.

The recommendations embodied in Alternative D and G reflect different interpretations of the literature. As such, some have characterized this difference as a debate about whether the goshawk is a habitat generalist or an old forest specialist. Actually, the interpretations are not that different.

The two sets of recommendations for nesting areas and post-fledging areas are virtually identical. For foraging areas, both recognize the need for large areas containing a variety of vegetation types but including an old forest component. The difference between these viewpoints focuses primarily on the question: How much old forest is required and how should old forest be distributed across the foraging areas?

The available scientific information does not provide direct answers to this question. It should be noted that of the initial 11 papers reviewed in this supplement in support of the opposing scientific view (documents A.7.) only 2 (Hargis et al. 1994; Woodbridge and Detrich 1994) of the 11 documents were published in peer-reviewed journals. The other nine consisted of unpublished progress reports to granting agencies (Beier 1994; Mannan and Smith 1993; Snyder 1995), unpublished agency reports (Crocker-Bedford 1994; Titus et al. 1994), an unpublished thesis (Austin 1993), and a published, but not peer-reviewed, abstract (Crocker-Bedford 1995).

Recommendations in Alternative G are based on RM-217 which synthesized studies of: (1) knowledge of the life-history, ecology, behavior, and diets of goshawks; (2) vegetative composition of sites at which goshawks were actually detected

during foraging activities; and (3) the natural history and habitat of 14 important goshawk prey species.

The recommendations embodied in Alternative D were based on studies that indicated significant goshawk use of old forest for foraging. Furthermore, it should be noted that these studies do not provide information that could be directly used to determine necessary amounts and distribution of old forest in foraging areas. The recommendations in Alternative D represent a different set of working hypotheses concerning the need for old growth within foraging areas. The studies cited in the joint Arizona and New Mexico game agencies' letter, along with other studies cited in the legal challenge to the FEIS, could also be considered consistent with the recommendations in RM-217 as detailed in section B.2.

In summary, there is some difference of opinion concerning appropriate amounts and distribution of closed canopy old forest in goshawk foraging areas. The Preferred Alternative (Alternative G) continues to rely on the scientific information synthesized in RM-217 for the following reasons:

- None of the available scientific information directly answers the question of how much old forest is needed in goshawk foraging areas and how should it be distributed. RM-217 represents a reasonable interpretation of that literature based on an extensive review of scientific literature. While recognizing the importance of mature and old forest to goshawks and many of their prey, the actual recommended amount of mature and old forests in RM-217 was determined by the growth dynamics of forests. Based on forest dynamics, the maximum amount of mature and old forest (to 240 years) in a sustaining forest landscape is 40 percent (20 percent in mature, 20 percent in old forest) (Reynolds et al. 1992).
- RM-217 brings together information on habitat used by goshawks and habitat used by their principle prey species and forest dynamics. Thus, it is a systems-based recommendation that attempts to provide for both goshawks and the faunal community that supports them, all within constraints imposed by the dominant vegetation comprising a forest type.

- The recommendations in RM-217 would result in large-scale forest composition and structure that is consistent with our knowledge of the historical range of variability of the forests in the Southwest. Such forest structure could be reliably sustained over time. Forest composition and structure resulting from the recommendations contained in Alternative D would be much more difficult to sustain.

Proposed Listing of Northern Goshawk Under the Endangered Species Act

On June 29, 1998, the U.S. Fish and Wildlife Service (USFWS) announced a 12-month finding on a petition to list the northern goshawk in the contiguous United States west of the 100th meridian under the Endangered Species Act, as amended. After review of all available scientific and commercial information, the USFWS found that listing the population was not warranted (63 FR 35183) (Appendix K).

The conclusions on which the USFWS based its finding are relevant to the discussion here. In announcing its finding, the USFWS stated that it based its finding on the following conclusions:

1. While forest management (i.e., timber harvest and fire exclusion) has changed the vegetation characteristics throughout much of the western United States, the goshawk continues to be well-distributed throughout its historic range.
2. The USFWS found no evidence to conclude that the goshawk population is declining in the western United States, that habitat is limiting the overall population, that there are any significant areas of extirpation, or that a significant curtailment of the species' habitat or range is occurring.
3. The petition contended the goshawk is dependent on large, unbroken tracts of old growth and mature forest and asserted that declines in such forests were placing the species in danger of extinction. However, neither the petition nor other information available to the USFWS supported this claim.

4. The USFWS “found that while goshawks frequently use stands of old growth and mature forest for nesting, overall the species appears to be a forest habitat generalist in terms of the variety and age classes of forest types it uses to meet its life history requirements” (63 FR 35184).

Data Quality Act Petition on Northern Goshawk Science

On January 17, 2003, a petition to correct information disseminated by the USDA Forest Service, namely the “Management Recommendations for the Northern Goshawk in the Southwestern United States” (RM-217), was filed on behalf of four requesters (Coalition of Arizona and New Mexico Counties, Northern Arizona Loggers Association, Washington Contract Loggers Association, and William K. Olsen (primary contact)). The petition addressed alleged multiple information quality violations and errors in RM-217 and attempted to display the errors and violations were of such significance and magnitude that corrections alone were not adequate, and withdrawal of RM-217 was the only appropriate remedy. This petition was one of five requests for correction regarding the northern goshawk filed under the United States Department of Agriculture (USDA) Information Quality Act Guidelines and Data Quality Act (DQA) (Public Law 106-554 §515).

The petition alleged violations of the science supporting such topics as nest area size, quantity and stand structure, post-fledging family areas, canopy cover, goshawk prey species and desired foraging area conditions, vegetative structural stage, as well as others.

The petition provided comment on the literature cited within RM-217. In addition, it listed an additional 12 references used in formulation of the petition. Only the USFWS 1998 finding on the listing of the northern goshawk dealt directly with the species. Other papers referenced in the petition addressed topics such as silviculture, probability and statistics, and songbirds.

On July 25, 2003, following a review of the information challenged in the request (petition), the Agency found no significant errors requiring substantive changes to RM-217. The review did discover eight minor errors. None of the errors affected the desired forest conditions or the specific

management recommendations. In one of these errors, RM-217 misquoted a single reference. The misquote did not change or influence the outcome of the management recommendations.

The January 17, 2003, request to retract (withdraw) RM-217 was denied because no significant errors were found and no substantive changes were needed. An erratum was distributed with the publication that corrected the errors.

Following this determination, a September 4, 2003, Request for Reconsideration of the January 17, 2003, petition was filed under United States Department of Agriculture (USDA) Information Quality Act Guidelines and Data Quality Act (DQA) (Public Law 106-554 §515) on behalf of the same four requesters. The request primarily addressed perceived procedural errors in the review process, with additional comment on the topics displayed in the original petition.

The USDA convened a panel to review the Request for Reconsideration even though RM-217 is considered non-influential information by the Forest Service. The panel consisted of three participants—one each from the Natural Resources Conservation Service, Food Safety Inspection Service, and Forest Service.

Following careful examination and thoughtful review of the Request for Reconsideration, the panel affirmed the Forest Service response and found no compelling evidence to support retraction or amendment of the original July 25, 2003, Agency response. The panel determined that the initial Agency response was conducted with a great deal of care and due diligence, resulting in identification of eight technical errors unrelated to the request for reconsideration, which the Agency corrected. In addition, an extensive scientific review was conducted by the Agency in examination of the claims of the requester.

The panel found that RM-217 was the product of extensive peer review in the scientific community qualified to produce the specified data and recommendations.

Following a request by the Coalition of Arizona and New Mexico Counties, the Data Quality Act Petition and Request for Reconsideration were reviewed for the presentation of new information (science) related to the northern goshawk.

The review found no new information was presented within the DQA petition that had not been already integrated into the discussion. The review panel found, and documented in its January 8, 2004, correspondence that the “request was developed as a surrogate ‘peer comment’ on the overall document.” [RM-217] The panel continued by stating, “The request was also based upon a directed policy outcome rather than identifying a clear informational deficiency.” Subsequent review of literature used in this supplement verified that no new information was displayed in the petition that has not already been integrated herein.

Threatened and Endangered Species, Critical Habitat and Section 7(a)(2) Consultation of the ESA

Listed Species and Critical Habitat

The number of species listed as threatened or endangered and the number of species with

designated critical habitat that occur in the USDA Forest Service’s Southwestern Region has changed over time. Changes have occurred for several reasons: new listings and delistings, litigation supporting listings, and litigation challenging the validity of listings. For example, the peregrine falcon was delisted, the Chiricahua leopard frog was listed, and designated critical habitat for the loach minnow, spikedace and cactus ferruginous pygmy owl was designated, withdrawn and re-designated, and as a result of litigation the designated population segments of gray wolves was rendered invalid.

Currently there are 30 endangered and 15 threatened species, 2 proposed species, 13 designated critical habitats and 3 proposed critical habitats, 3 experimental populations, 1 proposed experimental population, and 10 candidate species in the Southwestern Region (Table 7).

Table 7. Federally Listed, Proposed, and Candidate Species, and Designated or Proposed Critical Habitats in the Southwestern Region

Common Name	Scientific Name	Federal Status	Critical Habitat
MAMMALS			
Black-footed ferret	<i>Mustela nigripes</i>	Endangered	No
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	Candidate	NA
Jaguar	<i>Panthera onca</i>	Endangered	No
Lesser long-nosed bat	<i>Leptonycteris curasoae verbabuenae</i>	Endangered	No
Mexican gray wolf	<i>Canus lupus</i>	Experimental non-essential	NA
Mexican long-nosed bat	<i>Leptonycteris nivalis</i>	Endangered	No
Mount Graham red squirrel Critical Habitat	<i>Tamiasciurus hudsonicus grahamensis</i>	Endangered Designated	Yes
Ocelot	<i>Leopardus (=Felix) pardalis</i>	Endangered	No
BIRDS			
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	No
Cactus ferruginous pygmy owl	<i>Glaucidium brasilianum cactorum</i>	Endangered	Yes, but none in Action Area
California condor	<i>Gymnogyps californianus</i>	Experimental non-essential	NA
Least tern (interior pop.)	<i>Sterna antillarum</i>	Endangered	No
Mexican spotted owl Critical Habitat	<i>Strix occidentalis lucida</i>	Threatened Proposed	Proposed

Common Name	Scientific Name	Federal Status	Critical Habitat
Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	Endangered Proposed Experimental non-essential	No
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	No
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Candidate	NA
Yuma Clapper rail	<i>Rallus longirostris yumanensis</i>	Endangered	No
FISH			
Apache trout	<i>Oncorhynchus apache</i>	Threatened	No
Arkansas River shiner (Canadian R. pop. only)	<i>Notropis girardi</i>	Threatened	Yes
Critical Habitat		Designated	
Chihuahua Chub	<i>Gila nigrescens</i>	Threatened	No
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Endangered	Yes
Critical Habitat		Designated	
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Experimental non-essential	NA
Desert pupfish	<i>Cyprinodan macularius macularius</i>	Endangered	Yes
Critical Habitat		Designated	
Gila chub	<i>Gila intermedia</i>	Proposed Endangered	Proposed
Proposed Critical Habitat		Proposed	
Gila topminnow	<i>Poeciliopsis occidentalis</i>	Endangered	No
Gila trout	<i>Oncorhynchus gilae</i>	Endangered	No
Little Colorado Spinedace	<i>Lepidomeda vittata</i>	Threatened	Yes
Critical Habitat		Designated	
Loach minnow	<i>Tiaroga cobitis</i>	Threatened	Yes
Critical Habitat		Designated	
Razorback sucker	<i>Xyrauchen texanus</i>	Endangered	Yes
Critical Habitat		Designated	
Rio Grande silvery minnow	<i>Hybognathus amarus</i>	Endangered	Yes
Critical Habitat		Designated	
Sonora chub	<i>Gila ditaenia</i>	Threatened	Yes
Critical Habitat		Designated	
Spikedace	<i>Medu fulgida</i>	Threatened	Yes
Critical Habitat		Designated	
Yaqui catfish	<i>Ictalurus pricei</i>	Threatened	Yes
Critical Habitat		Designated	

Common Name	Scientific Name	Federal Status	Critical Habitat
Yaqui chub	<i>Gila purpurea</i>	Endangered	Yes
Critical Habitat		Designated	
Zuni bluehead sucker	<i>Castostomus discobolus yarrowi</i>	Candidate	NA
AMPHIBIANS/REPTILES			
Boreal Toad	<i>Bufo boreas</i>	Candidate	NA
Chiricahua leopard frog	<i>Rana chiricahuensis</i>	Threatened	No
New Mexican ridge-nosed rattlesnake	<i>Crotalus willardi obscurus</i>	Threatened	No
Sonora tiger salamander	<i>Ambystoma tigrinum stebbinsi</i>	Endangered	No
INVERTEBRATES			
Alamosa springsnail	<i>Pseudotryonia alamosae</i>	Endangered	No
Gila springsnail	<i>Pyrgulopsis gilae</i>	Candidate	NA
Huachuca springsnail	<i>Pyrgulopsis thomsoni</i>	Candidate	NA
New Mexico springsnail	<i>Pyrgulopsis thermalis</i>	Candidate	NA
Sacramento Mountains checkerspot butterfly	<i>Euphydryas anicia cloudcrofti</i>	Proposed Endangered	Proposed
Proposed Critical Habitat		Proposed	
Stephan's riffle beetle	<i>Heterelmis stephani</i>	Candidate	NA
Three forks springsnail	<i>Pyrgulopsis trivialis</i>	Candidate	NA
PLANTS			
Arizona agave	<i>Agave arizonica</i>	Endangered	No
Arizona cliff-rose	<i>Purshia (=Cowania) subintegra</i>	Endangered	No
Arizona hedgehog cactus	<i>Echinocereus triglochidiatus var. arizonicus</i>	Endangered	No
Canelo hills ladies'-tresses	<i>Spiranthes delitescens</i>	Endangered	No
Fickeisen plains cactus	<i>Pediocactus peeblesianus var. fickeiseniae</i>	Candidate	NA
Holy ghost ipomopsis	<i>Ipomopsis sancti-spiritus</i>	Endangered	No
Huachuca water umbel	<i>Lilaeopsis schaffneriana ssp. recurva</i>	Endangered	Yes
Critical Habitat		Designated	
Kuenzler hedgehog cactus	<i>Echinocereus fendleri var. kuenzleri</i>	Endangered	No
Pima pineapple cactus	<i>Coryphantha scheeri var. robustispina</i>	Endangered	No
Sacramento Mountains thistle	<i>Cirsium vinaceum</i>	Threatened	No
Sacramento prickly poppy	<i>Argemone pleiacantha spp. Pinnatiseca</i>	Endangered	No
San Francisco Peaks groundsel	<i>Senecio franciscanus</i>	Threatened	Yes
Critical Habitat		Designated	
Todsen's pennyroyal	<i>Hedeoma todsenii</i>	Endangered	Yes, but none in the Region
Zuni fleabane	<i>Erigeron Rhizomatus</i>	Threatened	No

Endangered Species Act Consultations

The current 11 national forests land and resource management plans (LRMPs), as amended, are covered by numerous Endangered Species Act (ESA) Section 7 consultations. Refer to the following:

LRMP Consultations

There have been 6 formal ESA § 7 consultations in the region, covering each of the 11 LRMPs and their amendments. These include:

1. The initial consultation on each LRMP in the region (Table 8).
2. The November 25, 1996, jeopardy and adverse critical habitat modification biological opinion (BO) on the existing LRMPs for the Mexican spotted owl (U.S. Fish and Wildlife Service (FWS) 1996; #000032 RO).
3. The November 25, 1996, non-jeopardy and no adverse critical habitat modification BO on the 1996 Regional LRMP Amendment to the region’s LRMPs for the Mexican spotted owl (U.S. Fish and Wildlife Service 1996b; 000031RO).
4. The December 19, 1997, non-jeopardy and no adverse critical habitat modification BO/Conference Opinion (CO) for all federally listed or proposed species and

designated or proposed critical habitats other than the Mexican spotted owl, which included what has become known as the “Seven Species Direction” (U.S. Fish and Wildlife Service 1997; 000087RO).

5. The January 17, 2003, non-jeopardy BO on the proposed implementation rate for the grazing Standards and Guidelines (S&Gs) (U.S. Fish and Wildlife Service 2003; 000031RO).
6. The June 10, 2005, Programmatic Biological and Conference Opinion on the continued implementation of the 11 national forest LRMPs as amended (U.S. Fish and Wildlife Service 2005; 2-22-03-F-366). Each of these consultations is discussed below.

Initial Consultation on Each National Forest LRMP in the Region

The LRMPs for the 11 national forests in the region were developed from 1985 to 1988 and each national forest prepared a biological evaluation (BE) for its LRMP. Consultation was done for all “may affect” determinations for the species and critical habitats that were federally listed or proposed when the LRMPs were developed. The FWS issued a Biological Opinion and Conference Opinion on each LRMP between 1985 and 1987, all with non-jeopardy/no adverse critical habitat modification opinions (Table 8).

Table 8. LRMP Consultations for the 11 National Forest in the Southwestern Region

National Forest	LRMP Approval Date	Consultation Date (FWS Consultation No.)
Apache-Sitgreaves	October 1987	May 6, 1986 (No. 2-21-83-F-016)
Carson	October 1986	September 2, 1985
Cibola	July 1985	February 13, 1985
Coconino	August 1987	December 1986
Coronado	August 1986	December 6, 1985
Gila	November 1986	October 4, 1985 (No. 2/ES-SE 000087RO)
Kaibab	April 1988	February 27, 1987
Lincoln	October 1986	July 19, 1985 (No. 2-22-83-F-032)
Prescott	August 1987	March 4, 1986 (No. 2-21-83020)
Santa Fe	September 1987	August 11, 1986 (No. 2-22-86-F-043)
Tonto	October 1985	July 26, 1985 (No. 2-21-83-F-13)

Jeopardy Biological Opinion on the Existing LRMPs for the Mexican Spotted Owl and Critical Habitat

After the Mexican spotted owl was proposed on November 4, 1991, and listed as threatened on March 16, 1993, the Forest Service began conferencing and consultations on site-specific projects. The Forest Service initiated informal consultation on the Mexican spotted owl and critical habitat for its existing LRMPs on September 6, 1995. After submitting the biological assessment on September 22, 1995, the Forest Service and FWS met five times in October 1995, to discuss additional information needs. The Forest Service submitted additional information and formal consultation was initiated on November 9, 1995. A jeopardy and adverse critical habitat modification BO for the existing LRMPs was issued on November 25, 1997, but a non-jeopardy/no adverse modification BO issued the same day for the amended LRMPs rendered this consultation moot (see below).

Non-Jeopardy Biological Opinion on the Amended LRMPs for the Mexican Spotted Owl and Critical Habitat

The Forest Service, in cooperation with the FWS and with input from the Mexican Spotted Owl Recovery Team, amended the Standards & Guidelines (S&Gs) of the existing LRMPs to conform to the management recommendations in the “Mexican Spotted Owl Recovery Plan.” The amended S&Gs were incorporated into the region’s 11 LRMPs on June 5, 1996.

On July 14, 1995, the Forest Service submitted a BA and requested formal consultation on Alternative G in the “Draft Environmental Impact Statement – Amendment of LRMPs.” On October 10, 1995, the Forest Service submitted the “Supplemental Biological Assessment - Environmental Impact Statement Amending the LRMPs to Incorporate Standards and Guidelines for the Mexican Spotted Owl and Northern Goshawk” and additional data and information. The FWS issued a non-jeopardy/no adverse modification BO on the region-wide amendment on November 25, 1997.

Non-jeopardy Biological Opinion on the Amended LRMPs for Federally Listed Species Other Than the Mexican Spotted Owl

In January 1996, the Forest Service and FWS signed an agreement on procedures for

consultation on the region’s 11 LRMPs for all listed and proposed species and critical habitats (except the Mexican spotted owl and critical habitat, which were covered in two separate BOs described above). The Forest Service requested initiation of formal consultation/conferencing on May 15, 1996. The FWS sent a draft BO/CO to the Forest Service on September 18, 1997, and issued a final non-jeopardy/no adverse modification BO/CO on December 19, 1997.

Consultation on the Proposed Implementation Rate for the Grazing Activities

The June 1996, region-wide LRMP amendment contained livestock grazing S&Gs that are applicable in Mexican spotted owl nesting and foraging habitat. The Forest Service prepared a BA and requested re-initiation of consultation on November 7, 2002. A request for formal consultation was sent to FWS on November 7, 2002. The FWS issued its non-jeopardy BO on January 15, 2003.

Most Recent LRMP Consultation

In February 2003, the Forest Service and FWS began discussions about the continued relevance of the existing LRMP consultations. In early April 2003, the Forest Service re-initiated consultation on the 11 LRMPs and the 1996 region-wide LRMP amendment.

On June 2, 2003, the Forest Service and FWS completed a consultation agreement for the 2003 regional LRMP consultation. On June 4, 2003, the FWS concurred with the list of species to be considered in the consultation. The Forest Service completed a biological assessment on the continued implementation of the 11 national forest LRMPs as amended on April 8, 2004. On June 10, 2005, the FWS completed the programmatic biological and conference opinion on the continued implementation of the 11 national forest LRMPs, as amended.

Consultation Conclusion

The preferred alternative is to implement Alternative G, as described in the “Final Environmental Impact Statement for Amendment of Forest Plans” (November 1995) and the “Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico.” This alternative is, in effect, a continuation of current forest plan direction related to the northern goshawk, Mexican spotted owl, and old growth. The scope of this action includes all 11 Southwestern Region national forests in Arizona and New Mexico

and is considered to have a short term (5 to 10 years) lifespan. Each of the region's forest plans are scheduled for revision beginning in 2005.

Alternative G was developed to respond to the Mexican Spotted Owl Recovery Plan. It was developed in collaboration with the U.S. Fish and Wildlife Service (including a recovery team member). Standards and guidelines for the northern goshawk were developed in early May 1995, and considered all known information from the Goshawk Interagency Implementation Team recommendations, the joint Arizona Game and Fish Department and New Mexico Department of Game and Fish letter that responded to the draft, and experience gained during implementation of the interim direction.

The Agency has assessed the need for section 7 consultation on the current SFEIS for the northern goshawk and concluded that the current section 7 consultation that applies to the 11 national forest

land and resource management plans and the regional amendment June 5, 1996, are unaffected by and provide section 7 coverage for the current northern goshawk SFEIS.

On July 15, 2005, the Agency sent a letter to the U.S. Fish and Wildlife Service requesting validation of the section 7 assessment. On September 1, 2005, the Agency received a reply to its request validating out assessment of the need for section 7 review of the NGH SFEIS. The USFWS stated, "We agree that selecting Alternative G results in no change in management direction for all land and resource management plans for all 11 national forests and grasslands in the Southwestern Region. Further, we also agree with your assessment that section 7 consultation is not needed on the supplemental Final EIS because the affects to listed species from Alternative G (i.e. 1996 Regional Plan amendments) have already been addressed in the Service's recent June 10, 2005, Biological Opinion."

Supplemental Consultation and Coordination

Preparers and Contributors

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during development of this supplement to the final environmental impact statement:

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List of Agencies, Organizations and Persons to Whom Copies of the Supplement to the FEIS Were Sent

This supplement to the final environmental impact statement has been distributed to individuals who specifically requested a copy of the document. In addition, copies have been sent to the following Federal agencies, federally recognized tribes, State and local governments, and organizations representing a wide range of views regarding the management of national forests in the Southwestern Region of the USDA Forest Service.

Federal Agencies

U.S. EPA, Region IX, San Francisco, CA
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U.S. Bureau of Land Management, Roswell, NM
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Pueblo of San Juan, San Juan Pueblo, NM
Pueblo of Taos, Taos, NM
Pueblo of Zuni, Zuni, NM
Kaibab Paiute Tribal Council, Fredonia, AZ
Pueblo of San Felipe, San Felipe Pueblo, NM
Cocopah Indian Tribe, Somerton, AZ
Havasupai Tribal Council, Supai, AZ
Pueblo of Laguna, Laguna Pueblo, NM
Colorado River Indian Tribe, Parker, AZ
Pueblo of Jemez, Jemez Pueblo, NM
Pueblo of Santa Clara, Espanola, NM
Hualapai Tribe, Peach Springs, AZ
Chairman Ute Mountain Ute Tribe, Towaoc, CO
Quechan Indian Tribe, Yuma, AZ
San Juan So. Paiute Tribe, Tuba City, AZ
Ak-Chin Indian Community, Maricopa, AZ
Pueblo of Isleta, Isleta Pueblo, NM
Navajo Nation, Window Rock, AZ
White Mountain Apache Tribe, Whiteriver, AZ
Mohave-Apache, Fountain Hills, AZ
Pueblo of Zia, Zia Pueblo, NM
Pueblo of Picuris, Penasco, NM
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Pueblo of Sandia, Bernalillo, NM
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Supplemental Consultation and Coordination

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Northern AZ University, School of Forestry, Flagstaff, AZ
Mohave County Public Land Use Commission, Kingman, AZ
New Mexico State University, Las Cruces, NM
San Miguel County, Las Vegas, NM
Lincoln County, Carrizozo, NM
Eddy County, Carlsbad, NM
Otero County, Alamogordo, NM
Village of Angel Fire, Angel Fire, NM
New Mexico Dept. of Game & Fish, Santa Fe, NM
Greenlee County, Clifton, AZ
Coalition of Arizona/New Mexico Counties, Glenwood, NM
NM Department of Agriculture, MSC APR, Las Cruces, NM
Hidalgo County Public Land Advisory Committee, Animas, NM

Business and Special Interest Groups

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Chiricahua Regional Council, Portal, AZ

Mesa Four Wheelers, Mesa, AZ
New Mexico Cattle Growers Assn., Albuquerque, NM
Sacramento Grazing Assn., c/o Jimmy Goss, Weed, NM
Carson Forest Watch, Llano, NM
The Nature Conservancy, Tucson, AZ
Sierra Club, Tularosa Basin Group, Alamogordo, NM
Sierra Club, Pajarito Group, Los Alamos, NM
Tierra y Montes SWCD, Las Vegas, NM
Center for Biological Diversity, Tucson, AZ
New Mexico Audubon Council, Los Alamos, NM
Southwest Forest Alliance, Flagstaff, AZ
Wildlife Management Institute, Ft. Collins, CO
Defenders of Wildlife, Washington, DC
Evans Ranches, Alpine, AZ
Salt River Project, Environmental Services, Phoenix, AZ
Sandia Peak Ski Co., Albuquerque, NM
Ski Apache, Manager, Ruidoso, NM
Chilton Ranch & Cattle Co., Arivaca, AZ

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**Comments to the Draft Supplement
to the
Final Environmental Impact Statement
for Amendment to Forest Plans,
and Forest Service Responses**



November 15, 2004

Harv Forsgren
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USDA Forest Service
Attn: Goshawk SEIS Team
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Sent by USPS and electronic mail

Re: Draft Supplement to the Final Environmental Impact Statement for the Amendment of Forest Plans: Arizona and New Mexico

INTRODUCTION AND SUMMARY

Forest Guardians is commenting here on the *Draft Supplement to the Final Environmental Impact Statement for the Amendment of Forest Plans: Arizona and New Mexico* (Goshawk DSEIS). Forest Guardians seeks to preserve and restore native wildlands and wildlife in the American Southwest through fundamental reform of public policy and practices. In our work, we aim to: protect and restore the native biological diversity and watersheds of the American Southwest; educate and enlist citizens to support protection of the forests, rivers, deserts and grasslands of this arid region; advocate for the principles of conservation biology in plans to restore degraded ecosystems and watersheds; enforce and strengthen environmental laws; support communities in efforts to protect their land and to practice and promote sustainable use of natural resources. Forest Guardians represents 1,400 members in and around the Southwestern states.

The Goshawk (*Accipiter gentilis*) DSEIS is seriously flawed and fails to cure the deficiencies found by the Ninth Circuit Court of Appeals.¹ Once again, after a limited review of the scientific literature the USFS concludes that its original findings and resulting guidelines still hold true, when in fact, the overwhelming majority of evidence points to significantly different conclusions and species requirements. It may be generally true that the northern goshawk will use a variety of forest types for foraging, depending upon circumstances, but logic does not lead one to conclude the species is therefore a forest generalist. Goshawks are forest specialists with a strong preference for mature forests. These forests support abundant prey species and contain attributes necessary for successful hunting of that prey. There is evidence that at least one of the goshawks primary prey species in the Southwest, the Abert's squirrel, is rare and declining because

FG-1

FG-2

¹ Center for Biological Diversity v. USFS D.C. No. CV-00-01711-RCB (9th Cir. 2003).

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of the loss of mid range VSS classes upon which it is dependent. Therefore the USFS' thinning program targeting these mid range VSS classes may be further jeopardizing the Goshawk and its main prey species in Region 3.

FG-2

Further, the Goshawk's population status in the Southwestern Region is not clear, but most evidence leads to the conclusion that the population is declining. It is obviously time for the USFS, in cooperation with wildlife management agencies, to undertake programmatic population monitoring and a status review.

FG-3

In addition, the northern goshawk is designated a Management Indicator Species (MIS) on several forests in Region 3 and should be considered for the remaining forests with substantial habitat for the species.

FG-4

Finally, the goshawk DSEIS ignores much of the current science regarding the impacts on goshawk habitat from domestic livestock management as well as the significant failure of the USFS to monitor the condition of that habitat. The agency is obligated both legally and professionally to review new science and any monitoring results regarding the impacts of grazing on the northern goshawk since the Amendment ROD was signed almost a decade ago.

FG-5

DISCUSSION

I. Critical Science not Considered

The present DSEIS is compelled under the 9th Circuit Court of Appeals ruling in Center for Biological Diversity v. USFS D.C. No. CV-00-01711-RCB (9th Cir. 2003).

In that opinion the court held: "that the Final EIS fails to disclose and discuss responsible opposing scientific viewpoints in the final statement itself in violation of NEPA and the implementing regulations."²

"Agencies shall insure the professional integrity, including scientific integrity, of the decisions and analysis in environmental impact statements."³

"They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement."⁴

NEPA requires that the Forest Service candidly discloses in its EIS the risks of its proposals, and that it responds to adverse opinions held by respected scientists.⁵

² Ibid.

³ 40 C.F.R. § 1502.24.

⁴ Id.

⁵ Seattle Audubon Society v. Moseley, No C92-479WD (1992). Friends of the Earth v. Hall, 693 F. Supp. at 934, 937.

“A disagreement among scientists does not in itself make agency action arbitrary or capricious, nor is the government held to a “degree of certainty that it ultimately illusory.”⁶

An EIS must serve the purpose of informing the decisionmaker and the public of the risks of its proposed action before the decision to proceed is made and must inform the decisionmaker of the full range of opinion.⁷

Conclusory statements, which do not refer to the scientific or objective data supporting them, do not satisfy the requirements of NEPA for a “detailed” environmental impact statement.⁸ NEPA requires that the public receive the underlying environmental data from which a Forest Service expert derives their expert opinion.⁹ NEPA’s implementing regulations require agencies to identify any methodologies used and make explicit reference by footnote to the scientific and other sources relied on for conclusions used in any EIS statement. 40 CFR § 1502.24.

Once again, it appears in the DSEIS that the Forest Service has selected science that casts no doubt on its *a priori* conclusions in regards to habitat and prey requirements of the northern goshawk. In addition, the Forest Service fails to include scientific information, what little exists, regarding population trends and viability of the species itself.

FG-6

Specifically, there is some work, though very limited, that indicates the population numbers for the northern goshawk are falling, on the Apache-Sitgreaves National Forest in particular.¹⁰ Though the final report was unable to conclude that its data trends indicated long-term or short-term phenomenon, it concluded that in 44 territories on the Apache-Sitgreaves, “values of key demographic parameters suggest that goshawk reproduction was not sufficient to balance local mortality during the study period, and that the local population would decline in the absence of immigration.”¹¹ Ingraldi (2001) also found that “long-term goshawk response to forest restoration prescriptions are unknown and cannot be directly evaluated for at least a decade” and “management action that decrease canopy or tree density may decrease goshawk reproduction and survival.”¹²

⁶ Seattle Audubon Society v. James Lyons, No. C92-479WD, December 21, 1994 quoting in part Greenpeace Action v. Franklin, 14 F. 3d 1324 (9th Cir. 1992).

⁷ Seattle Audubon Society v. Moseley, No C92-479WD (1992). Citizens Against Toxic Sprays, Inc. v. Bergland, 428 F. Supp. 908, 902 (1977).

⁸ Citizens Against Toxic Sprays, Inc. v. Bergland, 428 F. Supp. 908 (1977).

⁹ Idaho Sporting Congress v. Thomas, No. 97-35339, CV-96-0371-S-BLW (9th Cir. 1998).

¹⁰ Ingraldi, M.F. *Demography and habitat characteristics of northern goshawks on the Apache-Sitgreaves National Forest 1993-2000*. Arizona Dept. of Game and Fish Final Report. June 2001.

¹¹ *Id.*

¹² *Ibid.*

Twenty years of scientific investigation by Dr. Jack States seems to also counter many of the conclusions and recommendations of Reynolds et al. (1992) as well as the Regional guidelines themselves regarding prey abundance and availability. See for example *Expert Declaration of Dr. Jack Sterling States in Support of Plaintiffs' Motion for Summary Judgment* in *Center for Biological Diversity v. Williams*.¹³ Dr. States refers to a loss of squirrels in study areas on the North Kaibab Ranger District and attributes this negative population trend to the absence of Vegetation Structural Stage (VSS 4-6). Dr. States has suggested elsewhere that the main winter food source of Abert's squirrel, mycorrhizal fungi (in particular truffles) are significantly and positively correlated with stand canopy cover and basal area to a lesser degree.¹⁴ Dr. States also notes that "plots characterized by densely canopied VSS 3's and 4's had the highest squirrel densities and also the highest fungus production."¹⁵

FG-7

If indeed Abert's squirrel contributes significantly to the goshawk prey base in the Southwest, as has been suggested, then this information regarding the squirrel's abundance and food requirements would be significant information perhaps conflicting with the recommendations of Reynolds et al. (1992). In fact, if this information is accurate, then the entire "thinning" and fire risk reduction program of the Southwestern Region of the USFS may be putting both the northern goshawk and Abert's squirrel populations viability at risk in violation of the National Forest Management Act (NFMA).

II. Failure to Monitor Goshawk Populations in Southwestern Region

Lack of population monitoring and the failure track of the number of projects affecting individual territories run the risk of reducing habitat below sustainable levels for individual territories, eventually leading to population declines. In order to ensure this does not occur, the Forest Service needs to conduct region-wide population surveys as well as site-specific project surveys and maintain a database of goshawk territories and projects and impacts taking place within their habitat.

FG-8

Some studies of goshawk population trends have been done on the Kaibab, Sitgreaves and Coronado National Forests- all have shown grave problems. According to the U.S. Fish & Wildlife Service "Preliminary data from Ingraldi (1998)¹⁶ suggest that the Sitgreaves population may be unstable...goshawks may be exhibiting signs of decline..." (USFWS 1998). Goshawks are also declining on the Coronado National Forest

¹³ *Center for Biological Diversity and Sierra Club v. Michael Williams*, Case No. CV 04-0355 PCT RCB (Dist. of Ariz.).

¹⁴ States, J. *Draft Research Proposal: Response of Abert's Squirrels and Mycorrhizal Fungi to Management Modifications of Ponderosa Pine Vegetative Structural Stages*. Northern Arizona State University. See also: States, Jack S. and W. S. Gaud. 1997. *Ecology of hypogeous fungi associated with ponderosa pine. I. Patterns of distribution and sporocarp production in some Arizona forests*. *Mycologia* 89: 712-721 and Dodd N. L., J. S. States, and S.S. Rosenstock. 2003. *Tassel-eared squirrel population, habitat condition, and dietary relationships in north-central Arizona*. *J. Wildlife Management* 67:622-633.

¹⁵ Text and citations from Center for Biological Diversity.

<http://www.biologicaldiversity.org/swcbd/species/goshawk/swreview.PDF>.

¹⁶ See note 5.

(Snyder 1995). A U.S. Forest Service researcher measured declines on the Kaibab National Forest and concluded that goshawks have declined by 75% since logging began (Crocker-Bedford 1990). His projection of the current population was confirmed by a more intensive study by other Forest Service researchers (Reynolds and Joy 1998). They found that goshawk nesting success was lower on the Kaibab than most areas in North America and that recent trends show a decline.

The New Mexico Department of Fish and Game (Williams 1997) reviewed all goshawk monitoring data on New Mexico national forests between 1991 and 1996. They concluded that "territorial occupancy by breeding goshawks has declined considerably while productivity has declined drastically."

III. Goshawk and MIS Designation

Management indicator species (MIS) were defined in the 1982 forest planning regulations implementing the National Forest Management Act (NFMA) of 1976.¹⁷ MIS are a subset of all animal and plant species in a planning area that are selected for planning and management purposes. "In order to estimate the effects of each alternative on fish and wildlife populations, certain [species] present in the area shall be identified and selected as management indicator species." A key reason MIS are selected is "because their population changes are believed to indicate the effects of management activities."¹⁸ MIS are selected to represent several categories, such as commonly hunted or fished species, species representing rare habitats, non-game and threatened and endangered species (TES).

Because the USFS has, in name, transformed its logging program in Region 3 to a "thinning" and forest restoration program and claims that this new program has only beneficial effects on species such as the northern goshawk and Mexican spotted owl, it must adopt indicators that will reflect the benefits or costs of this new management paradigm. The USFS should select the goshawk as an indicator for the forest habitats that it professes its management programs promote. In fact, many of the agency's findings for sensitive species and TES are based on this assumption that the Region's new thinning programs can only have beneficial effects on these species. This assumption must be confirmed with concrete data.

FG-9

After a thorough review of the status of the northern goshawk population in Region 3, the Forest Service should amend the national forest plans in to designate the species a Management Indicator Species for mature and old growth aspen, ponderosa pine and mixed conifer forests. Such a designation is needed to ensure that the cumulative effects of multiple logging, fuel reduction, recreation and other projects don't compromise the long-term viability of the goshawk and other mature and old growth forest obligate species and to ensure its survival throughout forested habitats of the Region in accordance with the National Forest Management Act.

¹⁷ 36 C.F.R. 219.

¹⁸ 36 C.F.R. 219.19(a)(1).

There are at least five national forests already in the Southwestern Region which have taken this action: the Kaibab, Apache-Sitgreaves, Coconino, Tonto, and Prescott. The remainder of the National Forests in the region that support these rare habitat types and the northern goshawk should, at this time, consider revising their respective Land and Resource Management Plans to include the species as an MIS.

FG-10

IV. Grazing Impacts Ignored

Livestock grazing is known to adversely affect raptors in the Southwest and elsewhere.¹⁹ Livestock grazing:

1. Causes unnatural levels of seedling establishment by removing the grasses and forbs which would naturally compete with seedlings;
2. Causes meadow encroachment by drying out meadows, thereby making them more suitable for tree growth. Meadows are dried out by ground cover removal, sheet erosion and gullyng; and,
3. Suppresses fire by removing the grasses and forbs which formerly served as the major carrier of low-intensity fire.

Forest Guardians completed a review of grazing allotments in the Southwestern Region on November 10th. The purpose of the review and ensuing report was to understand the degree to which the amended plan requirements were being met in regards to monitoring the forage utilization standard. The Forest Service's 1996 plan, among many other things, incorporated a three-pronged approach to improve grazing management described in the U.S. Fish and Wildlife Service's (FWS) Recovery Plan for the Mexican Spotted Owl (MSO).

The amendments required the Forest Service to:

- Impose grazing standards on each allotment, which are typically expressed as a "forage utilization" figure that prescribes the percentage of the plant's biomass that may be consumed by the cattle.²⁰ (MSO Recovery plan at 94.)
- Monitor each grazing allotment to ensure compliance with the forage utilization standard. (*Id* at 94.)
- Restore or maintain riparian areas to good condition. (*Id* at 90. Riparian areas are ecologically important areas that border rivers and streams.)

Using the Freedom of Information Act (FOIA), Forest Guardians obtained the Forest Service's monitoring records from 1999 to 2003 for all grazing allotments. We used this information to investigate and document to what degree these new requirements incorporated into the forest plan amendments were being implemented. The results of this

¹⁹ Kochert, M.N., B.A. Millsap and K. Steenhof. 1993. *Effects of livestock grazing on raptors with emphasis on the southwestern U.S. Proceedings of the Southwestern U.S. Raptor Management Symposium and Workshop*; Newton, L. 1979. *Population Ecology of Raptors*. Buteo Books, Vermillion, SD 399 pp.

²⁰ Utilization is defined as the percentage, by weight, of a year's growth of a plant that is consumed by grazing animals.

investigation showed significant numbers of allotments were not monitored, and of those allotments that were monitored, violations occur in significant numbers.²¹

The Forest Service has missed an obvious opportunity and failed to fulfill its legal obligations to revisit the impacts of grazing on goshawks in the Southwestern Region. The FEIS and Record of Decision for management of habitat for Mexican spotted owl and northern goshawk were signed in 1996: nearly a decade ago! New information and science are available that may be critical in managing the forest and grasslands in the Southwestern Region of the Forest Service and the agency is obligated by NEPA to consider this new information. Besides its legal obligation it has a professional obligation here as well to revisit the issue of grazing impacts on the northern goshawk.

FG-11

CONCLUSION

Thank you for consideration of Forest Guardian's concerns. If you have any questions, or wish us to provide you with any clarification or further documentation of the matters raised in these comments, please do not hesitate to contact the undersigned.

Sincerely,



Bryan Bird
Forest Program Coordinator

²¹Exhibit 1. *Grazing Out Of Control: Failed Grazing Management on the National Forests of New Mexico and Arizona, 1999-2003*. A report by Forest Guardians, November, 2004.

FG-1

Together with the MRNG (Reynolds et al. 1992), the original environmental impact statement for amendment of forest plans, and this “Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans,” the Agency has reviewed over 450 northern goshawk related materials that include peer-reviewed scientific papers, published journal articles, masters’ theses, unpublished non-peer-reviewed scientific papers, correspondence, and alternative views and scientific perspectives (see Bibliography, Project Record 140). In addition, many of the reviewed materials are based on literature references not specifically listed in the references sections of the above Agency documents.

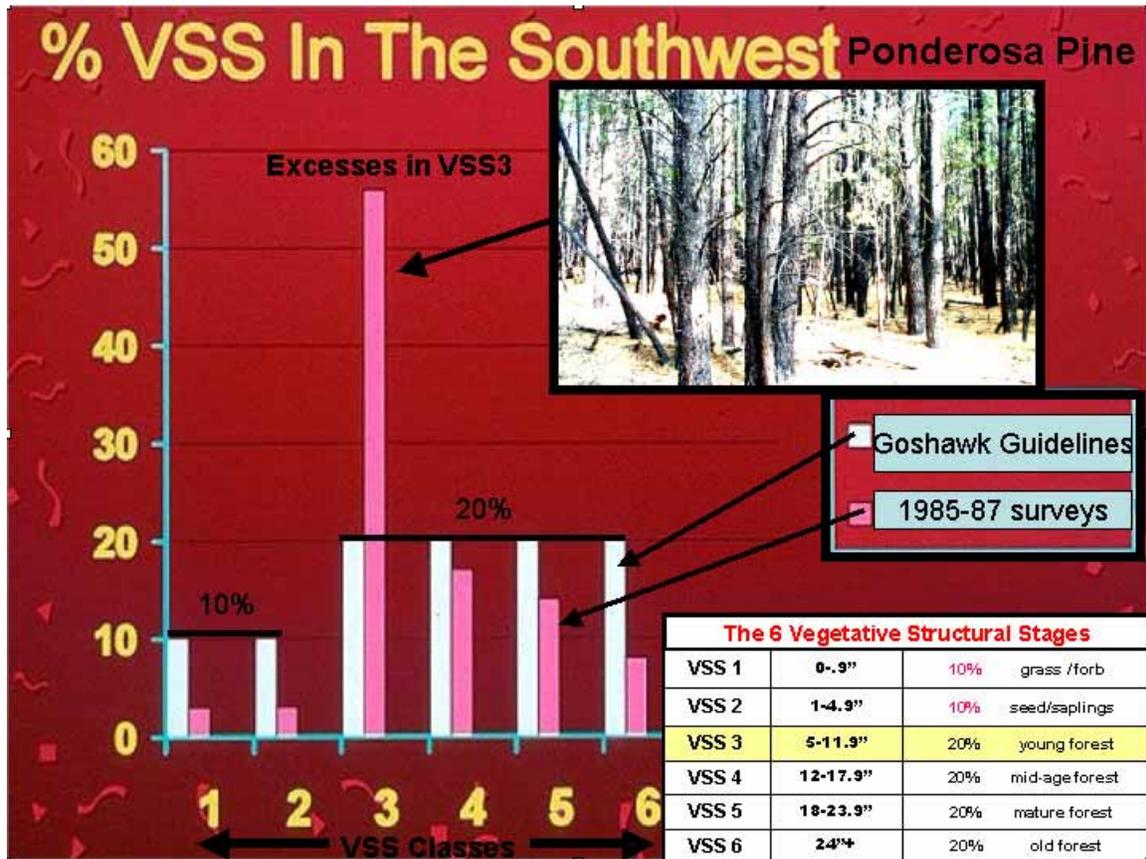
The Agency continues to review and assess northern goshawk related literature as it becomes available. Based on this indepth review of available literature the Agency has remedied the Ninth Circuit Court’s determination to disclose the scientific debate in the FEIS (USDA-FS 1995) and provide for an informed decision on management of forests within the Southwestern Region, and in particular, maintenance and management of northern goshawk habitat.

FG-2

The contention made in FG-2 is that a further decline in the “rare” Abert’s squirrel (a goshawk prey species) may continue due to a loss of mid-range vegetative structural stages (VSS 3-4) resulting from implementation of the MRNG, and any reduction in squirrel prey base will have detrimental effects on the goshawk.

The MRNG (Reynolds et al. 1992), identify three forest age classes (VSS) that are important to Abert’s squirrel: VSS 4, 5, and 6. The MRNG suggested that about 20 percent of a goshawk post-fledging family area (post-fledging area) and 20 percent of a foraging area (foraging area) be in VSS 3 and 20 percent in VSS 4, the “mid-range” VSS class in question in the FG-2 comment. The MRNG suggested that thinning of VSS 4 might help attain the larger trees specified in VSS 5 (mature forest) and 6 (old forest), but that thinning of VSS 4 should be constrained by the desire to have minimum canopy covers in the VSS 5 and VSS 6 of 50 percent in the post fledging area and 40 percent in the foraging area in ponderosa pine forests. These minimums should be easily attained because VSS 5 and 6 trees are in groups with interlocking crowns where canopy cover can easily exceed 80 percent. The MRNG recommended these minimums because it was recognized that very dense VSS 4 may never produce large trees due to excessive competition for light, moisture, and nutrients. Some very dense VSS 4 should be thinned to produce the desired larger trees in VSS 5 and 6. Thinned VSS 4 will develop denser canopies with time, tree growth, and crown spread. Minimums are specified, however, to prevent excessive opening of VSS 4, and subsequent VSS 5 and 6. Contrary to FG-2, the MRNG protects and perpetuates the habitats of Abert’s squirrels.

The following graph shows the VSS breakdown in the Southwest as of the time most forest plans were being published (1985-87). The graph shows nearly a twofold excess of VSS 3 (nearly 60 percent of the ponderosa pine landscape rather than a target level of 20 percent) with all other VSS categories below desired levels. VSS classes in shortest supply are VSS 1 and 2 (seedling/saplings) and VSS 6 (old-growth). There are also shortages of VSS 4 and 5, but to a lesser degree than shortages in VSS 1-2 and VSS 6.



Regional Forest Inventory and Analysis (FIA) data compiled by Jeff Hogg, Forestry and Forest Health Group, Southwestern Region of the Forest Service.

Due to unprecedented pine regeneration in the early 1900s, fire suppression, and past management practices involving a failure to thin to encourage growth on smaller trees, there now exists a considerable excess of VSS 3 throughout the Southwest (Braun et al. 1996, p 6)). The VSS distribution outlined in the MRNG promotes a more steady flow of VSS structural stages over time needed to optimize the amount of VSS 5 and 6 that can be sustained on the landscape (USDA-FS 2004, p 33) over time.

It is important to understand that all ecosystems, including forest ecosystems, are in a state of dynamic change. Individual trees become established as seedlings grow to maturity and eventually die. The same is true when discussing vegetative structural stages. VSS 1 openings are created on the landscape through a number of disturbance processes (insects, wind, fire, harvesting). Trees become established over time and move into the various structural stages as they grow, mature, and die. The MRNG recognize this dynamic nature of forest ecosystems and calls for the establishment of a VSS distribution on the landscape that can be sustained over time. The MRNG does not say that a particular vegetative structure stage must exist in the same location on the landscape over time. This is not biologically possible.

Excess VSS 3 areas are often selected for thinning and regeneration treatments for the following reasons:

1. The VSS 3 excess over much of the ponderosa pine forest type in the Southwest is primarily the result of excessive regeneration becoming established in the early 1900s, fire suppression, and a continued lack of thinning in immature seedling, sapling, and pole stands through most of the 1900s. Accelerated thinning is needed to compensate for the lack of thinning in the past.
2. Many VSS 3 areas are overly dense due to both past management actions (emphasis on large tree removal) and the lack of management actions (thinning in dense immature stands), resulting in hazardous fuel conditions and centers for bark beetle and disease outbreaks.
3. High tree densities in many VSS 3 areas result in a lack of surface vegetation needed to support a variety of goshawk prey base and to retain soils in place. The degradation of watershed conditions is an issue in the Southwest.
4. A solution to reducing shortages of VSS 4-6 is to thin excess VSS 3 areas to increase growth rates. Thinning shortens the time needed for VSS 3 areas to develop into VSS 4 areas.
5. An effective solution to increasing VSS 1 areas, while reducing excess VSS 3 areas, is to create small regeneration openings in VSS 3 areas rather than in VSS 5 and 6 areas. The larger, seed-producing trees within the VSS 3 areas, as well as adjacent VSS 5 and 6 areas, can provide the seed source to regenerate newly created VSS 1 areas.

Failure to promote VSS 1 and 2 areas at a steady rate today will result in shortages in the larger VSS classes over time. Failure to thin excess VSS 3 stands to conditions found within their historic range of variability will further slow stand development into needed VSS 4-6 conditions. In some cases, without adequate thinning, dense VSS 3 areas may never develop into VSS 4 areas due to the current threats from stand-replacement fires and increased insect epidemics in the Southwest.

Not all existing VSS 3 areas should be nor need be treated. Approximately 20 percent of the landscape needs to be retained as VSS 3 until existing VSS 1 and 2 areas can be developed to move into the VSS 3 condition. The review of Austin (1993) by the Goshawk Scientific Committee points out the need for a balance of VSS stages across the landscape (Reynolds et al. 2001, p 5).

A comparison of historic and present day stand data and writings of early explorers support the idea that historically there were fewer immature pole areas (VSS 3) in our ponderosa pine forests than there are today (Braun et al. 1996, p 5-8). Because the current surplus of VSS 3 areas may not be sustainable over time, even if a high correlation between acres of VSS 3-4 and Abert's squirrel numbers exists, it may not be possible to sustain current squirrel numbers.

Preliminary findings by Beier (1994, p 4) suggest that when selecting foraging sites, goshawks do not pay attention to prey density. A review of Beier's document by the Goshawk Scientific Committee (Reynolds et al. 2001, p 7) gives little support to Beier's conclusion concerning prey density, but adds that no Abert's squirrels and red squirrels were observed in Beier's study area. This lack of squirrels in Beier's study area indirectly shows that goshawks survive on a mix of prey species and that a decline or complete absence of one or more of these prey species may not

mean reductions in goshawk numbers, merely a shift in diet. Providing for a mix of prey species for the goshawk is a primary premise of the goshawk management guidelines to best guarantee goshawk continued survival.

FG-3

There is little rigorous evidence that any goshawk population is currently declining. However, there is a presumption that goshawk populations declined in the northeastern U.S. following intensive tree harvests there in the late 19th and early 20th century. The presumption of a decline was based on recent discoveries of breeding goshawks in areas that have become reforested and where goshawks nested historically but not in recent decades (Speiser and Bosakowski 1984).

The published research that is often cited in FG-3 (e.g., Crocker-Bedford 1990) as demonstrating a goshawk population decline due to timber harvest is suspect because the annual sampling efforts for nesting pairs of goshawks in the Crocker-Bedford (1990) study appeared to have been insufficient (see Reynolds et al. (2005) for discussion of necessary sampling efforts to accurately estimate the reproductive status of goshawks). Furthermore, Reynolds and Joy (in press) and Reynolds et al. (2005) identified extensive annual variation in reproduction of goshawks on the Kaibab Plateau, the same area where Crocker-Bedford (1990) conducted his study. These intensive and long-term studies showed that goshawk reproduction is highly variable and appeared to be cyclic with a periodicity of around 8 to 10 years. Thus, the Crocker-Bedford (1990) study, which was conducted over just 3 years (1985-87), may have also been confounded by annual variation in goshawk reproduction. That is, the Crocker-Bedford study may have coincided with a period of decreasing reproduction, making it appear that the population was declining.

The “Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico” (FSFEIS) was prepared to display, discuss, and disclose scientific arguments and information which are in opposition to the findings in the original FEIS which were based on the MRNG (Reynolds et al. 1992). Reynolds and Joy (1998) demonstrated that goshawk productivity can vary widely by year, while nest or territory occupancy remains fairly stable. Boyce et al. (2005) has demonstrated that much of the goshawk survey data, often used to show population trends is invalid, based on the number of attempts at locating nest sites. Currently, all 11 national forests including 44 ranger districts, in the Forest Service’s Southwestern Region have collected nesting information on the northern goshawk.

FG-4

The northern goshawk is identified as a management indicator species (MIS) on five national forests (Apache-Sitgreaves, Coconino, Kaibab, Prescott, and Tonto) in the Southwestern Region. Management indicator species are selected to reflect the habitat needs for a majority of forest species. An indicator species is a plant or animal whose population change reflects a population change of other species within a group. Indicator species respond to habitat changes early or at low levels of stress and, therefore, are sensors of the effect of management activities that occur in various habitats. Management indicator species were chosen for given vegetation types, seral stages, and the vegetative components of the given habitat. The northern goshawk is but one species that can reflect habitat changes. For the six national forests that do not have the northern goshawk as an MIS, other species were chosen that better reflect changes in populations of other species that use a particular habitat type.

FG-5

The FSFEIS was prepared to display, discuss, and disclose scientific arguments and information which are in opposition to the findings in the original EIS which are based on the MRNG (Reynolds et al. 1992). The purported impacts of livestock grazing on the northern goshawk suggested in FG-5 are outside the scope of this assessment. The MRNG addresses forest structure not herbaceous vegetation. Further, the scientific literature which is suggested to be in opposition to the MRNG also addresses forest structure issues, not the effects of livestock grazing. We know of no scientific evidence directly linking long-term trends (10 plus years) in northern goshawk populations to the effects of livestock grazing in the Southwest.

In addition, the MRNG identified a desired condition regarding the grass/forb/shrub VSS and the desired maximum level of grazing (Reynolds et al. 1992, p 24).

FG-6

Refer to Response FG-1. The Agency's literature review list includes numerous papers that discuss population trends and the viability of the northern goshawk. In addition, the FSFEIS includes a discussion of the U.S. Fish and Wildlife Service's June 29, 1998, announcement that listing under the Endangered Species Act of the northern goshawk population in the contiguous United States west of the 100th meridian was not warranted (63 FR 35183). It is anticipated that the debate of the habitat needs of the northern goshawk will continue, and the Agency will continue to review and assess northern goshawk related literature as it becomes available.

FG-7

The MRNG described the importance of VSS 4 to Abert's squirrels (Reynolds et al. 1992, p 74), and this importance was based on Dr. J. States' research (States 1985, States et al. 1988) and his personal communication to the MRNG scientific committee during development of the MRNG. The MRNG recommended that 40 percent of both the post-fledging area and foraging area be in VSS 3 (20 percent) and VSS 4 (20 percent). This is the amount of VSS 3 and 4 that is needed to provide and sustain the VSS 5 and VSS 6 in goshawk landscapes.

Because the MRNG recommended reducing the density of trees and woody debris, both of which have increased since fire suppression, implementing the MRNG would significantly reduce fire risk (Reynolds et al. 1992, p 30).

FG-8

National Forests in the Southwestern Region have been monitoring northern goshawks for over 10 years. Beginning in 1991, a standardized protocol became available for conducting goshawk surveys. This protocol included standard procedures for timing, intensity, and duration of goshawk surveys. Data has been summarized for each national forest in the Southwestern Region beginning in 1991 and ending in the 2004 field season. As reported in Reynolds et al. (2003), goshawk productivity on many national forests in the region was down during the drought. The summarized information is reported by post family-fledgling area. The post fledgling area is described in the MRNG (Reynolds et al. 1992, p 13).

In addition, refer to Response FG-3.

FG-9

Refer to response FG-4. In addition, management indicator species are identified based on habitat types, not management activities.

FG-10

Refer to response FG-4. In addition, it is anticipated that all 11 national forests will begin revising their forest plans within the next 2 to 4 years. The 2005 Planning Rule (36 CFR 219), which will guide the amendment and revision of forest plans, no longer includes management indicator species.

FG-11

In 1996, the Southwestern Region's forest plans were amended. The provisions of this amendment as it related to grazing management are being implemented consistent with the 1996 Record of Decision which stated, in part, "The region-wide amendment to forest plans will be applied through project level decisions which will include site-specific environmental analysis and public involvement" (USDA-FS 1996, p 15).

With respect to grazing activities, the intent of the amendment is to require forest managers to make site-specific determinations regarding forage utilization for each allotment through the National Environmental Policy Act (NEPA) and allotment management planning processes. Grazing authorizations (permits) resulting from these NEPA analyses and decisions provide the appropriate guidance for forest utilization in compliance with the 1996 forest plan amendment and best available science.



BECAUSE LIFE IS GOOD.

November 15, 2004

Harv Forsgren
Southwestern Regional Forester
Attn: Goshawk SEIS Team
333 Broadway Blvd., SE
Albuquerque, NM 87102

Dear Mr. Forsgren:

These are comments for the Center for Biological Diversity on the Draft Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans, dated September, 2004. The Center for Biological Diversity is a non-profit public conservation organization with over 9,000 members nationwide. The Center has long been interested in protecting the northern goshawk, and we have submitted comments on this project since its earliest iterations in the 1990's. Our members use and enjoy forests where goshawks can currently be found and, like many people, visit forests to see goshawks and other old-growth and mature-forest dependent creatures. We will be affected by the goshawk decision.

The following comments are a supplement to our earlier comments on the first EIS; we do not feel a need to repeat the discussion of goshawks and the goshawk plan that we have already made and that was, in fact, appended to the current SDEIS at Appendix AA. Those comments should be considered to be incorporated here, and, because no changes to the decision have been made, the points made in our administrative appeal of the 1996 FEIS should also be incorporated here.

1. The History of the Habitat Generalist/Habitat Specialist Dispute and the Court Order

The Forest Service first began to respond to concerns about the status of the goshawk and its diminishing habitat in 1990, when it established the Northern Goshawk Scientific Committee to review the goshawk's habitat needs. *Center for Biological Diversity v. U.S. Forest Service*, 349 F.3d 1157, 1160, (9th Cir. 2003). Two years later, the Forest Service announced its intent to prepare an environmental impact statement that would amend the Forest Plans in Arizona and New Mexico in order to afford protection for the goshawk. *Id.* at 1161.

The Scientific Committee published its report in 1992, and concluded that the goshawk was a "habitat generalist" that occupied a variety of different forest habitat types. *Id.* The Report recommended managing for goshawk habitat by encouraging a particular balance of different forest age and structural types, including stand openings that could be created by logging. Generally, forty percent of the landscape in goshawk foraging areas is to be comprised of the two oldest structural classes, VSS 4, 5, and 6; the remaining sixty percent is to be the youngest forest stands and openings. *Id.* See also Richard Reynolds et. al., *Management Recommendations for*

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the Northern Goshawk in the Southwestern United States, US Forest Service General Technical Report RM-217, August 1992, pp 23, 26.

In response to the Report, the Forest Service received letters of criticism regarding the conclusion that the goshawk is a “habitat generalist” from the Arizona Game and Fish Department and the Regional Director of the U.S. Fish and Wildlife Service. These agencies both indicated that there was a substantial body of evidence that the goshawk is limited not by lack of openings and prey base, but by an overabundance of such openings. *Center for Biological Diversity v. U.S. Forest Service*, 349 F.3d at 1161,1162. The crux of this dispute, since the 1990s, has been this question: does the goshawk prefer more old, closed canopy forest, dominated by large trees, or does the goshawk prefer a greater variety of habitats, with openings and young forest dispersed throughout approximately sixty percent of the goshawk’s territory? Is it lack of large, old trees that is causing the goshawk’s populations to decline, or is it a lack of forests openings and clearcuts? The Forest Service proposes to assist the goshawk through the creation of openings even though there is no evidence that supports such management, and, to the contrary, there is mounting evidence that logging, particularly in the PFA, harms the goshawk. It is not lack of openings but lack of old forest that is impairing goshawk populations.

CBD-1

In 1994 the Forest Service released its Draft EIS for amending the Forest Plans in Arizona and New Mexico. *Id.* at 1162. The document “did not specifically mention or discuss the opposition expressed by the Fish and Wildlife Service’s and the Arizona Game and Fish Department’s submissions challenging the Management Recommendations for the Northern Goshawk’s conclusion that the goshawk is a habitat generalist.” *Id.* (Acronyms in original, transposed here.) Instead, the Draft EIS asserted that the Management Recommendations represented the best science available. *Id.*

The Forest Service took comments on the Draft EIS, and again received widespread criticism for its conclusion that the goshawk is a generalist for which forest openings need to be created by logging. One scientist, employed by the Forest Service and a published researcher on Arizona goshawk, suggested that the Forest Service should cease all old-growth forest logging in ponderosa pine forests in Arizona and New Mexico, “because the scientific literature strongly intimates that goshawks prefer to forage in mature forests.” *Id.* at 1163. This scientist referenced both his own work and “numerous other scientific studies.” *Id.* The New Mexico Department of Game and Fish joined with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service to criticize the “habitat generalist” conclusion, stating that “the proposed old growth standard does not incorporate important habitat attributes or distribution requirements” to sustain the goshawk. *Id.* Again, the source of the dispute involved whether the goshawk is in greater need of logged forest openings and early and mid-seral forest or stands with large, old trees and high canopy closure. No one disputed that goshawks may occasionally hunt in openings, but whether such openings were *required* for goshawks to survive was rigorously disputed. And, the importance of old-growth and mature forest stands, many of which the Forest Service proposed to log in order to create openings for the goshawk, was stressed. The state game agencies and conservation organizations believed that the proposed plan, which would permit logging of large, old growth trees in many circumstances, put far too much emphasis on openings and far too little on the preservation of forest stands that have a high canopy cover and that are made up of large, old trees.

The Final EIS was released in 1995. Despite its obligation to do so, the document “did not mention or respond to comments challenging the agency’s conclusion that goshawks are

habitat generalists.” *Center for Biological Diversity*, 349 F.3d at 1165. The Forest Service signed the Record of Decision in 1996.

The agency decision was challenged by the Center for Biological Diversity and the Sierra Club, and was remanded to the agency by the Ninth Circuit Court of Appeals in 2003. *Id.* at 1169. The Court of Appeals found that “because the commenters’ evidence and opinions directly challenge the scientific basis upon which the Final EIS rests and which is central to it, we hold that the Appellees were required to disclose and respond to such viewpoints in the final impact statement itself.” *Id.* at 1167. As if aware that the agency might try to address the court’s concerns in the narrowest manner possible, the court reiterated NEPA’s objective that responsible opposing viewpoints be “internalize[d] into the decision-making process to ensure that an agency is cognizant of all the environmental trade-offs that are implicit in a decision.” *Id.* at 1167, 1168. In other words, the opposing views must be incorporated into the whole decision-making process, not just addressed at the end.

Finally, the court noted that the agency had failed to show how the evidence it provided supports the conclusion that goshawks are habitat generalists. *Id.* at 1168. “The mere presence of the information in the record,” the court wrote, “does not cure the deficiency here.” Thus, it is not enough for the agency merely to acknowledge that there is a dispute regarding the habitat needs of the goshawk; the agency must indicate how the entirety of the evidence supports the conclusions the agency has come to. *Id.* at 1168, 1169.

2. The Draft Supplemental EIS

To respond to the Ninth Circuit’s order that the agency “disclose and discuss responsible opposing viewpoints in the final statement itself” and to indicate how its evidence “supports its conclusions that goshawks are habitat generalists” the Forest Service released its Draft Supplemental EIS in September, 2004. This document contains a voluminous appendix with many scientific papers printed in full, but it contains only twenty-eight “new” pages added to the original EIS.

A careful comparison of the original EIS and the twenty-eight “new” pages, however, reveals that in twelve of those pages only extremely minor changes were made. The only addition to the original EIS of any substance is the entirely new “Review of Pertinent Information Concerning the Habitat Management for the Northern Goshawk.” This review is, essentially, a mere literature review appended on to the original EIS. Twenty-three papers or other documents are discussed in turn, with a few paragraphs devoted to each. First, six pages are devoted to seventeen studies that contest the “habitat generalist” conclusion. Then, three pages are devoted to six more studies that have come out since the EIS was prepared. This is followed by a three-paragraph section called “Discussion on Literature Review” and a two-page “Summary Discussion.” These two sections frame the entire dispute as a question of how much mature forest the goshawk requires, and they discuss in a very general way the differences between Alternative D and Alternative G. The section characterizes Alternative G, which the Forest Service originally chose, as relying on “scientific information” and “scientific literature” while it characterizes Alternative D as being based upon “unpublished progress reports, unpublished agency reports, an unpublished thesis, and a published, but not peer-reviewed, abstract.” (The document does not acknowledge that its favored Alternative G also relies on a great deal of unpublished and un-peer reviewed information.)

CBD-2

This section concludes by stating that “based on forest dynamics,” the “maximum amount” of mature forest that can be obtained in the Southwest is twenty percent, and the maximum amount of old forest is another twenty percent. *SDEIS* 33. This concludes the literature review, which makes up nearly the entirety of what has been supplemented to the original EIS.

3. Flaws in the SDEIS

a. The SDEIS Fails to Respond to the Court’s Order

The Ninth Circuit Court of Appeals ordered the final EIS to be remanded, holding that the final EIS “fails to indicate how [the Forest Service’s] evidence supports its conclusion that goshawks are habitat generalists.” *Center for Biological Diversity v. U.S. Forest Service*, 349 F.3d at 1168. The agency has apparently relied on the mere presence of the (unpublished, un-peer reviewed) paper “Is the Northern Goshawk an Old Growth Forest Specialist or a Habitat Generalist” in the SDEIS appendix in order to meet this requirement—the SDEIS does not contain any other indication of how its evidence supports this conclusion. All of the evidence proffered amounts only to a series of observations of goshawk in immature forests. No one—no conservationist, no agency biologist, no independent biologist, no one—disputes that goshawk are capable of flying, and occasionally do fly, from a mature forest into an opening in order to hunt for or capture prey. But the occasional presence of these birds in these habitats does not make them “habitat generalists.” In order to know whether an animal is a habitat generalist, one must be able to know whether the animal’s population is healthy and stable in such an environment, or whether a healthy population requires something more – requires a special feature. By framing the debate as one between the “generalist” and the “specialist,” the Forest Service has avoided addressing the only questions that matter: are goshawk populations stable or not? Where are they stable and where are they not stable? What is the type of habitat that is most desirable for growing goshawks? Given the two kinds of habitat in question, in which one would goshawks most likely flourish over time? Instead of asking and responding to these questions, the Forest Service has merely announced that many scientists have observed goshawk in habitats with diminished old growth and mature forest, and has thus concluded the animal must be similarly at home—and its populations similarly healthy—in these forests as in forests dominated by large, old trees and a heavy canopy. But that conclusion does not follow.

CBD-3

An honest appraisal of “how the evidence supports the conclusion that the goshawk is a habitat generalist” would include a definition of what the agency means by “generalist” and whether the goshawk populations in habitats characterized by large, old trees and high canopy closure are more stable than those in habitats that are not characterized by large, old trees and high canopy closure. But the agency’s document does not resolve this question, and does not respond to the court’s order.

b. A New EIS is Necessary

The standards for the Northern Goshawk were developed due to “concern with ensuring the viability of the northern goshawk.” FEIS for Amendment of Forest Plans, 1995, p. 1. Concern for the goshawk “heightened” in the 1990s, and the Forest Service at that time began

work on Forest Plan Standards designed to protect goshawk habitat. *Id.* p. 2. The Forest Service observed in the FEIS that “historically . . . little concern was expressed about the continued viability of this species.”

The Forest Service is required by the National Forest Management Act to “provide for diversity of plant and animal communities.” 16 U.S.C. § 1604(g)(3)(B). The implementing regulations for the National Forest Management Act require that viable populations of native species be preserved throughout the planning area. 36 C.F.R. § 219.19 Owing to the above requirements and the concern that the northern goshawk would become listed under the Endangered Species Act, the Forest Service undertook Forest Plan amendments to protect the bird from further population losses.

In this case, the Forest Service has responded to the court’s finding that the agency failed to show a connection between its evidence and its conclusion by merely adding a “literature review” to the document. But a literature review is not enough. The National Environmental Policy Act requires that “The agency shall discuss at appropriate points in the final statement any responsible opposing view . . . and shall indicate the agency’s response to the issues raised. 40 C.F.R. § 1502.9. In this case, the agency has apparently concluded that the “appropriate point” to discuss the considerable science that, as the Ninth Circuit Court of Appeals put it, “directly challenge[s] the scientific basis upon which the final EIS rests and which is central to it” is an appended sixteen page literature review. This literature review does not cure the original failure, does not provide a connection between the evidence and the conclusion, is not the appropriate point for the discussion, does not satisfy NEPA’s requirement (and the Court’s reminder) that the point of the analysis is to “internalize” the opposing issues, and only in the most basic manner comprises a “discussion” of the science that directly challenges the scientific basis upon which the final EIS rests. *See Center for Biological Diversity v. U.S.F.S.*, 349 F.3d at 1167.

Indeed, the court has already faulted the agency for doing precisely what it has now done again. The court warned that the agency may not merely “generally state that there are opposing views to the agency’s proposed standards and guidelines;” rather, the agency has a duty to show that those opposing views were considered throughout the analysis process.

Were this a supplement to a draft EIS, the current supplement would possibly suffice to alert the decision-maker, other federal and state agency reviewers, and the reviewing public that there are alternative points of view. 40 C.F.R. § 1502.9(a). However, NEPA requires in the case of final environmental impact statements that the opposing view must occur in the statement itself. 40 C.F.R. § 1502.9(b). More importantly, NEPA envisions a process by which the agency reviews and responds to the available science throughout the analysis process, not just at the end: “Environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made.” 40 C.F.R. § 1502.2(g). In this case, the agency, after refusing in its original analysis process to acknowledge the substantial weight of evidence that did not support its desired conclusion, and after being ordered by the Ninth Circuit Court to remand *the final statement* in an opinion that repeatedly states that the opposing scientific opinion must be revealed “in the text of the final statement itself” – after all this, the agency still believes that appending a simple “literature review” to the end of its original EIS is enough to cure the deficiencies in that EIS. *See Center for Biological Diversity*, 349 F.3d at 1169.

CBD-4

But doing so accomplishes nothing. It only proves that this decision is indeed a post-hoc rationalization of a decision already made. The agency needs to write a new environmental impact statement that addresses the opposing scientific views from the beginning, and that

CBD-5

addresses the questions above. It needs to consider where the goshawk is thriving and where it is declining, and if that information is unknown then it needs to respond to that fact as instructed at 40 C.F.R. § 1502.22. The agency must front up to the fact that the question of whether the goshawk is a “generalist” or a “specialist” is to a large degree beside the point – at least as the agency perceives this semantic distinction – and that the question that must be asked and then answered by the FEIS is how best to ensure continuing viability of the northern goshawk. In doing this it must consider the affected environment, including the loss of habitat in the Rodeo-Chediski and other fires, and it must consider in a careful way what the impacts will be from logging in the manner that it ultimately proposes. It must accomplish all of this in light of 40 C.F.R. § 1502.24, which requires that agencies insure the professional integrity of the discussions in their environmental documents.

CBD-5

c. At Least One New Alternative is Necessary

The Forest Service is instructed by NEPA to “rigorously explore and objectively evaluate all reasonable alternatives.” In the present case, the agency has neither rigorously explored the reasonable alternatives available, nor has it objectively evaluated the alternatives that it has already proposed.

The EIS is generally about how to save or create enough old-growth forest in order to preserve viable populations of goshawks, as required by the National Forest Management Act. Unfortunately, the agency can think of only one way to do that, which is to divide the forest into various classes, called “VSS” classes, and impose targets on the amount of each class desired around known goshawk nests. The result, however, is that logging can and does occur even in a VSS class that should be protected. Because, for example, VSS are defined by the majority of the stems in a stand, a stand with a majority of 16” DBH trees and a small number of 26” trees can be converted from a VSS 3 to a VSS 6 by logging it.¹ The result is that a stand that was once good habitat for goshawk has now been transformed, through logging, into a stand that is no longer good habitat for goshawk—all in the name of preserving goshawk. (Alternatively, and also commonly, the Forest Service can log a VSS 3 or 4 stand that contains large old trees, and convert the entire stand into a VSS 1, again transforming good habitat into bad, and again in the name of goshawk conservation.)

Clearly, another system needs to be considered. We propose, as we have been proposing for many years, a simple cap on the size of trees that can be logged. The Southwest, as we have noted in many comments and appeals to the Southwest Region of the Forest Service, has a tremendous shortage of trees twelve inches in diameter and up, and trees over sixteen inches in diameter are rare. Trees over twenty-four inches in diameter have vanished from many areas of the Southwest.

CBD-6

In any event, an alternative must be proposed that escapes the consequence that logging may occur in good goshawk habitat and render that habitat unavailable to goshawks. If such alternatives are the only ones adhered to, then the final document must address this fact, and

¹ To illustrate, consider a stand with 100 trees 16” DBH and 5 trees 26” DBH. This is a VSS 3 stand because the stems are predominantly 16” DBH. If there is no VSS 6 stand nearby, then the appropriate action to take under the Forest Service’s goshawk plan is, perversely, to *log the stand*, even though this logging will destroy the area for goshawk. This because logging all the 16” trees will leave just the 26” trees, and the stand is now dominated by stems >24” DBH, and is, therefore, a VSS 6. A good stand for goshawk has just been transformed into a bad one, and old-growth forest has just been manufactured by an industrial logging project.

must state why the agency has chosen not to propose an alternative that actually saves, rather than pretends to save, goshawk habitat.

CBD-6

d. The Standards Proposed do not Accomplish the Objectives Desired

As we have stated above, the current regime envisioned by all alternatives is flawed because it permits the Forest Service to convert good goshawk habitat into bad while following the letter, if not the spirit, of the guidelines. This problem must be addressed, but other features of the plan are also insufficient to protect the goshawk, and require a careful look.

To begin with, the EIS does not articulate exactly what the standards are that are envisioned for the different alternatives, although we know from the Record of Decision what Alternative G's standards are, and we now know from experience how haphazardly they have been followed. This next iteration of the final EIS must disclose what precisely the standards for each alternative are and how well the current standards have worked both to protect the goshawk and to protect old-growth forest.

CBD-7

Currently, there is a gaping chasm between the objectives of the EIS, to protect goshawk and their habitat, and the implementation of the standards on the ground. Site-specific environmental documents rarely if ever address in the necessary detail how they are meeting the goshawk requirements. The requirement to "manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape" is often asserted, but rarely shown in site-specific environmental analyses. The requirement to "restore degraded riparian areas to good condition as soon as possible" is nearly always ignored. The requirement to use the science found in the MRNG's is not followed. Inventories are not done as required. Nest replacement is not addressed. Snags and downed logs are not addressed, or not addressed sufficiently. Canopy cover is ignored. Road densities are not "managed at the lowest level possible." Grazing management is constantly undertaken without even a nod to the Forest Plan amendments. (One recent document we reviewed flatly stated that there is no connection between livestock grazing and goshawk habitat because "cows do not eat trees." See 9/24/2004 EA for Macho, Cow, Bull, and Soldier Creek and Valle Osha AMPs, Santa Fe National Forest.) Finally, the old growth standards appear to have been wholly forgotten about. Our FOIA's to the agency for information about where the current old growth allocations exist have been stonewalled for four months now, with the agency saying it does not make those allocations, or, if it does, only makes them for a specific point in time, and then dismisses them.

The result is that, first, the proposed standards are not effecting the changes envisioned by the environmental effects section of the EIS, and, second, are not meeting the NFMA sustainability and diversity requirements that the EIS was originally designed to achieve. This lack of a link between the stated objectives and the proffered solution violates the NEPA.

CBD-8

4. The Analysis of the Biology of the Goshawk is Incomplete or Erroneous

In narrowly reviewing only the nine studies required by the court and justifying continuing the limited protections of the original Amendment, the U.S. Forest Service ignores numerous studies conducted since 1992 showing that goshawks avoid forest conditions created by the MRNG and that suggest goshawks are harmed by these forest conditions, ignores considerable available information on the status of the goshawk, and fails to consider alternatives

CBD-9

that maximize goshawk habitat by restoring natural disturbance processes in ponderosa pine ecosystems.

CBD-9

a. The U.S. Forest Service failed to consider studies demonstrating goshawks are dependent on large tree, high canopy closure forests in the home range.

Although it is well recognized and undisputed in the DEIS that goshawks require mature forests for nesting, goshawk habitat requirements in the larger home range has continued to be a source of controversy with the DEIS asserting that although evidence indicates goshawks select mature and old-growth forests, the variety of seral-stages and forest structures found in the home range suggests they are a habitat generalist that use "habitats opportunistically." This conclusion runs counter to a considerable number of studies that show goshawks select large tree, high canopy closure forests in the home range, many of which the Draft Supplemental Environmental Impact Statement (DEIS) fails to consider.

CBD-10

Using radio telemetry to locate goshawks where they actually occur, studies consistently demonstrate goshawks select forest habitats with high canopy closure and large trees and avoid or don't select many of the stand characteristics created by the Amendment, such as young stands, logged openings and edges (Table 1 and further discussion below). These studies were either ignored by the MRNG or were not fully considered. Of nine studies, for example, that show goshawks select high canopy closure and/or large trees (Table 1), the DEIS cites only four (Austin 1993, Bright-Smith and Mannan 1994, Beier and Drennan 1997, and Hargis et al. 1994)(Table 1).

Table 1. Studies documenting goshawk selection for high canopy closure, tree density and tree size in North America.

<u>Study</u>	<u>Selected canopy closure</u>
Austin 1993	>40%
Beier and Drennan 1997	>80% most selected; mean = 48.3%
Boal et al. 2001*	Mean = 53–86% dependent on forest type
Bright-Smith and Mannan 1994	Mean rank of relative preference for stands increased with increasing canopy closure for all goshawks (>55% for three goshawks)
Drennan and Beier 2003	Mean = 50% (winter habitat use)
Hargis et al. 1994	Mean = 34%
Stephens 2001	Mean = 43.5% in mixed conifer, 21.9% in pinyon/juniper (winter habitat use)
	<u>Selected tree size and density</u>
Austin 1993	>52 cm dbh

Beier and Drennan 1997	Greater density of trees >40.6 cm dbh
Bloxtton 2002	>medium (30–50 cm dbh) and large (>50 cm dbh) tree density, basal area, total snag density, and small snag density (12.5–30 cm dbh)
Boal et al. 2001*	Tree densities of 570–1,030 stems/ha of trees 19.6–24.6 cm dbh, dependent on forest type
Good 1998	> tree density between 23–37.5 cm dbh
Hargis et al. 1994	>basal area and density of trees 15–27 and >46 <u>cm dbh</u>

*Did not statistically compare individual stand traits of used versus random stands.

The DEIS does not outright deny that goshawks select mature forests, as demonstrated in the above studies, but claims that goshawks use habitats opportunistically:

“Goshawks forage in larger areas surrounding the nesting areas. These areas are approximately 5,400 acres in size. There is evidence that goshawks use mature and old forest within these areas more heavily. However, goshawks use available habitats (openings) opportunistically which suggests that the choice of foraging habitat by goshawks may be as closely tied to prey availability as to habitat structure and composition.”

The above statement is presumably based on Reynolds (2004) (Appendix I to the DEIS), who concluded that because goshawks have been observed in unusual habitats, such as aspen surrounded by shrub-steppe and tundra, that goshawks use habitats opportunistically:

“The opportunistic behavior of goshawks is evidenced by the fact that, when a habitat contains sufficient trees to support goshawk nests and when there is sufficient and available food, goshawks occur whether the habitat is forests, woodlands, or shrub lands.”

We don’t deny that in other parts of North America goshawks are found in unusual habitats. As discussed above, however, numerous studies show goshawks selects large tree, high canopy cover forests in the Southwest and other parts of the western United States. In one of the premier textbooks on wildlife habitat relationships, Morrison et al. (1998) conclude:

“If many studies conducted across different time periods and locations consistently show preference of a particular resource or behavior, then one can likely infer that the species is exhibiting a behavior of adaptive significance; this implies a requirement.”

This is not to say that goshawks only occur in mature forests with large trees, and high canopy closure, but rather that such forests best allow the goshawk to fulfill its ecological needs. This fact is further evidenced by a number of studies discussed below that found reduced goshawk occupancy and productivity after removal of forest cover by logging. The fact that some

goshawks occur in shrub-steppe or tundra is ultimately immaterial to the habitat needs of the goshawk in Southwestern forests, where to date no studies have shown a preference for openings, young forests, or other features created by logging under the forest plan amendments and a number of studies have shown such logging harms goshawks.

The DEIS never defines what they mean by opportunistic behavior. Typically, this would be defined as using habitats according to their availability (Le Sorte et al. 2004). Under this definition, the goshawk clearly does not use habitats opportunistically, as the numerous studies cited in these comments demonstrate.

CBD-11

b. The U.S. Forest Service failed to consider several studies that show goshawk avoidance of young stands and openings.

The DEIS fails to discuss findings in several studies that goshawks avoid openings, young, logged forests and forests with <40% canopy closure (e.g. Austin 1993, Beier and Drennan 1997, Bloxton 2002, Boal et al. 2001, Bright-Smith and Mannan 1994, Titus et al. 1996). Austin (1993) found that goshawks avoided meadows; Fischer (1986) found that goshawks avoided open montane slopes and oak (*Quercus spp.*) shrubland-grassland was not present in their home ranges; and Boal et al. (2001) and Lapinski (2000) found that goshawks avoided open areas. Three studies demonstrated avoidance of clearcuts and seedling, sapling, and young stands (generally stands younger than 30 years) (Austin 1993, Titus et al. 1996, Bloxton 2002). Austin (1993) and Beier and Drennan (1997) documented avoidance of stands with <40% canopy closure. Bright-Smith and Mannan (1994) documented avoidance of more open, partially logged old-growth forest. These studies run directly counter to provisions of the Amendments that call for managing 40% of the landscape in early seral and young forest, and creating openings both in the post-fledging family area (PFA) and foraging area.

CBD-12

More recently, both Joy (2002) and La Sorte et al. (2004) found that selection of nesting stands was associated with continuous forest, lack of openings and less vegetation diversity at the scale of the nest stand, PFA and in the case of Joy (2002) a portion of the foraging area. These studies provide further evidence that creating vegetation diversity and openings is not beneficial to the goshawk, particularly in the PFA.

c. The U.S. Forest Service failed to consider information indicating lack for selection for vegetation diversity, edges and prey abundance.

In concluding that existing science continues to support provisions of the Amendment, the DEIS ignores considerable evidence to the contrary and selectively cites studies. For example, the DEIS heavily relies on Hargis et al. (1994) because it was one of the few studies that concluded that vegetation diversity benefits the goshawk. Hargis et al., however, is only one of two radio-telemetry studies that found such selection (also Good 1998). Every other study didn't find similar selection or found the opposite. Bright-Smith and Mannan (1994), for example, found that only 1 of 11 goshawks showed any selection relative to stand diversity, using areas of high diversity less than expected. It is also important to note that Hargis et al. (1994) did not find that goshawks actually used open habitats. To the contrary, they found that goshawks selected forests with higher than average canopy closure and large trees. To the extent they found a

CBD-13

positive benefit of vegetation diversity, it was not logged areas that created such diversity, rather it was pumice fields and other naturally open habitats.

The DEIS similarly fails to discuss a lack of positive results in regards to forest edges and prey abundance, both of which the Amendment attempts to create. Three studies attempted to determine if goshawks selected forest edges with none finding a statistically significant relationship (Bright-Smith and Mannan 1994, Titus et al. 1996, Good 1998). Bright-Smith and Mannan (1994) did find that 1 of 11 goshawks used forested areas 50–100 m from forest edges more than expected based on availability. However, another of the goshawks used forested areas 50–100 m less than expected based on availability and 2 goshawks used forested areas >200 m from edges more than expected based on availability. Four studies comparing prey abundance at goshawk locations and random points suggested that goshawks did not select stands on the basis of prey abundance, but on forest structure (Fischer 1986, Beier and Drennan 1997, Good 1998, Drennan and Beier 2003). Beier and Drennan (1997) concluded:

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“We suggest that prey availability is more important than prey abundance in habitat selection by a forest raptor, the goshawk. Obviously, prey numbers are a component of prey availability: if prey are absent availability must be zero. However, we believe that as long as prey numbers are above a rather low threshold, goshawks select foraging sites where structural characteristics favor their foraging strategies.”

These contrary results were not discussed or given careful consideration by the DEIS.

d. The U.S. Forest Service failed to consider studies showing that goshawks select stands with >40% canopy closure.

The Amendment calls for managing ponderosa pine forests, the primary habitat for the goshawk in the Southwest, to have an average of 40% canopy closure over the 40% of the landscape covered by mature and old forests. This is less than the mean canopy closure of stands where goshawks have typically been observed as noted in Table 1, which was not discussed in the DEIS. Moreover, Beier and Drennan (1997) found that goshawks exhibited the greatest selection for stands with >80% canopy closure. Reducing stands to an average of 40% potentially will harm goshawk populations and should have been discussed by the DEIS.

CBD-14

e. The U.S. Forest Service failed to consider studies demonstrating that cutting in goshawk territories reduces goshawk occupancy and reproduction, goshawk density and viability.

Occupation and productivity. A number of studies in the western United States have documented that logging in goshawk territories reduces occupancy and productivity. Crocker-Bedford (1990) compared nest occupancy and productivity of goshawk territories from 1985–1987 where there had been only light timber harvest prior to 1973 (control locales) with territories where there had been a second selection harvest between 1973–1984 (treatment locales) on the Kaibab Plateau in northern Arizona. Nest occupancy rates in the 12 treatment territories were significantly lower (17%) than in the 19 control territories (63%) ($\chi^2 = 6.42, 1 \text{ df}, P = 0.012$). Territories in treatment locales averaged only 0.08 nestlings per territory (active and

CBD-15

inactive) compared to 1.32 nestlings per territory in control areas during 1987 ($t = 4.6$, 29 df, $P < 0.001$).

Crocker-Bedford (1995) reanalyzed his 1987 data with 22 additional territories that were not considered in Crocker-Bedford (1990) because they had some timber harvest in 1985 or 1986. Reanalysis documented significant differences in 1987 occupancy and productivity corresponding with 1973–1986 harvest levels within 2.7 km radius circles assumed to approximate goshawk home ranges. Home ranges ($n = 53$) were grouped into 4 classes based on amount of harvest: little to no harvest ($n = 12$), 10–39% of area selectively harvested ($n = 14$), 40–69% of area selectively harvested ($n = 16$), or 70–90% of the area selectively harvested ($n = 11$). For the 4 classes, nest occupancy rates were respectively 83%, 43%, 31% and 9% and young produced per nest cluster were 1.67, 0.86, 0.31, and 0.

Ward et al. (1992) compared canopy closure in 101-, 283-, 647-, and 1010- ha areas surrounding goshawk nest clusters (a group of alternate nest stands used by a single pair of territorial goshawks) on the Kaibab Plateau that were either still occupied or unoccupied in 1986 and 1989. In general, they found a “near total loss of the 60–80% and 80–100% canopy closure areas,” and a drastic reduction in the 40–69% canopy closure areas since 1972 (Ward et al. 1992, 5). Territories active in 1986 and 1989 had significantly or nearly significantly higher proportions of area with $\geq 40\%$ canopy closure for the 101-, 283-, 647-, and 1010- ha areas than inactive territories. Conversely, inactive territories had significantly or nearly significantly higher proportions of the 20–40% canopy closure class than did active territories. The near disappearance of the 60–80% and 80–100% classes precluded statistical analysis to determine if goshawk occupancy was correlated with canopy closures $> 60\%$.

Within lodgepole pine (*P. contorta*) and Douglas-fir (*Pseudotsuga menziesi*) stands on the Targhee National Forest in Idaho and Wyoming, Patla (1997) determined that high-occupancy territories had significantly greater proportions of mature forest cover and lower proportions of young forest and seedling cover within the nesting area (12.1 ha around nest tree) and post-fledgling area (170 ha around nest tree), and significantly less young forest cover in the foraging area (2,185.4 ha around nest tree), than low-occupancy territories.

Finn et al. (2002) demonstrated that occupancy at 30 historic goshawk nest sites (located between 1975–1996) on the Olympic Peninsula, Washington were related to habitat attributes in circles approximating the nest area (39 ha), post-fledging area (PFA; 177 ha), and home range (1886 ha). Goshawks were more likely to occupy nest sites with less nonforest cover (primarily consisting of clearcuts) and less heterogeneity in the home range. Goshawks were unlikely to occupy a nest site if nonforest cover exceeded 20% in the home range and 15% of the PFA. Late-seral forest was consistently $> 40\%$ of the landscape surrounding occupied nest sites at all scales. In addition, breeding success was “strongly and positively correlated with occupancy” (Finn et al. 2002, 427).

La Sorte et al. investigated the habitat associations of sympatric northern goshawks and red-tailed hawks at both fine- (16 m circle around nest) and mid- (2,085 m circle) scales on the Kaibab Plateau Arizona. At the fine scale, La Sorte et al. compared detailed measurements of forest structure in nest stands of the two species both to each other and to random points using a

combination of univariate and multivariate techniques. At the mid-scale, the effects of forest fragmentation on both species was examined by identifying the area and patch characteristics of non-forest area (defined as <20% canopy cover) within variable radius plots surrounding nest sites using Landsat imagery.

Non-forest area was an important discriminant of red-tailed hawk and goshawk nest sites at the mid-scale. Red-tailed hawks were associated with non-forested areas between 105-645 m and steeper slopes within 105 m of the nest site. In contrast, goshawks were consistently associated with continuous forest and negatively associated with nonforest area extending to 645 m. La Sorte et al. note that:

“This forested area corresponds to the post-fledging family area (PFA; Reynolds et al. 1992) estimated at 168 ha. or a circle of 732 m. The PFA, characterized by mature forest structure, is the area where adults forage during the breeding season and young develop their hunting skills... For goshawks, patterns at the mid-scale suggested that selection was occurring exclusively for regions of continuous forest on level terrain centered at the nest stand.”

Based on these results, La Sorte et al. conclude that “goshawks were considerably more specialized at both scales,” and that this suggests habitat is essential to goshawk management:

“The real issue is one of habitat: if the habitat requirements of a species are not available, that species will have difficulty fulfilling its ecological role. In this case, the threats to goshawk breeding habitat are more severe because of the goshawk’s specialization on features that have economic value and features that are threatened by catastrophic wildfires.”

Of these studies, only Crocker-Bedford and Chaney (1986), Crocker-Bedford (1990 and 1995) and Ward et al. (1992) were cited by the DEIS. Failure to consider this information resulted in the DEIS failing to evaluate or disclose the full effects of continuing management as prescribed in the Amendments. Collectively, these studies demonstrate that continued cutting as prescribed in the Amendment is likely to reduce goshawk occupancy and productivity. The Amendment allows logging that will reduce stand characteristics below those commonly found to be selected by goshawks (e.g. <40% canopy cover dominated) over 60% of the landscape. This is above the amount found to be detrimental to goshawk status in nearly all of the above studies. The Amendment also calls for managing the PFA for vegetation diversity, specifically creating early seral habitats, young forest and openings over 40% of the area. La Sorte et al. (2004) found that goshawks were selecting for areas of continuous forest in the PFA and thus it doesn’t make sense to manage the PFA for vegetation diversity, including early seral habitats.

CBD-16

Joy (2002) compared vegetation characteristics between high quality territories, low quality territories, and random locations. Territory quality was defined by measured reproductive fitness and vegetation was described using remote sensing techniques. Joy (2002) concludes:

“The majority of significant relationships within vegetative types occurred between higher quality territories and random locations. In particular, the amount of deciduous-

dominated vegetation (less) and openings (fewer) within a 0.60 km and 1.2 km radius of the sample plots were important. These distances incorporated the NA, PFA, and 11% of the FA (Reynolds et al. 1992) within a goshawk's home range... Greater proportions of ponderosa pine and lower diversity of vegetative types distinguish habitat in higher quality territories from random locations."

Based on these findings, Joy (2002) concludes:

"If higher quality territories represent goshawk population "sources," thus contributing to persistence of the species on the study area, then the habitat conditions therein should not be altered greatly beyond the vegetative characteristics identified in this study."

Density. Several studies have observed comparatively greater goshawk densities in areas where little or no logging has occurred. Crocker-Bedford and Chaney (1988), for example, found that mean goshawk density on the Kaibab Plateau was approximately 1.1 pair/1,000 ha. In an area that had received the least previous harvest, however, they observed goshawk densities of 1.5 pairs/1,000 ha.

CBD-17

Despite observed lower densities of goshawks in logged areas, the Kaibab Plateau is widely acknowledged to harbor both some of the best remaining habitat for goshawks and also some of the highest observed densities, in part reflecting relatively light history of logging. Kennedy (1989), for example, found a substantially lower goshawk density in the Jemez Mountains of New Mexico than the Kaibab Plateau (.64 pairs/1,000 ha. compared to 1.1 pairs/1,000 ha) and concluded:

"The northern goshawk population in the Jemez Mountains is lower than most published records. This is particularly apparent when you compare these densities with density estimates for the Kaibab Plateau in northern Arizona. This area is similar ecologically to the Jemez Mountains, but has not been managed for timber as intensively. Under similar management strategies, these two area should support similar northern goshawk nesting densities."

Similar results have been found in other regions of the goshawk's range. Widen (1997) reported the results of nine goshawk studies from throughout Fennoscandia documenting regional declines in densities of goshawk breeding pairs, ranging from loss of 1 pair/1,000 ha. to loss of 20 pairs/1,000 ha. in different study areas of Sweden. Based on these results, Widen concluded that goshawks had declined by 50-60% between 1950 and 1980 across Fennoscandia and that the most likely causes for these declines were logging of boreal forests and prey fluctuations. Significantly, Widen did not believe that logging had resulted in a shortage of nest stands, but rather decreases in hunting habitat:

"Several independent studies show that goshawk populations in Fennoscandia have declined by 50-60% from the 1950s to the 1980s. This decline coincides in time with an intensification of forest management, which has changed the forest landscape. I suggest that changes in the boreal forest landscape have resulted in a deterioration of goshawk hunting ranges, making it more difficult for them to secure adequate food for breeding.

This factor is more important than a shortage of suitable nest sites. Declining prey densities (e.g., grouse) may be associated with forestry and is also an important factor that may affect goshawk numbers.”

Population viability. Two long-term studies of goshawk population demography have been conducted, both in Arizona. Reynolds and Joy (1998) and Reynolds (1999) studied goshawks on the Kaibab Plateau from 1991-1996², using mark and recapture methods to estimate survival and productivity. Ingraldi (2001) monitored demographic vital rates of goshawks on the Sitgreaves portion of the Apache-Sitgreaves National Forest from 1993-1999. The study areas are within 150 air miles of each other and have similar climate and physiography. The extent of timber harvest, however, differs considerably between the two study areas. Ingraldi (2001), for example, states:

“Since European settlement, The Apache-Sitgreaves National Forest has been intensively managed, with much of the area grazed by livestock and used for timber production. Like many National Forest lands in the southwestern United States, the Apache-Sitgreaves National Forest is currently dominated by stands of younger age classes of ponderosa pine (*Pinus ponderosa*). Most ponderosa pine stands on level terrain have been logged, with the steeper slopes of canyons and drainages receiving less logging impact.”

CED-18

In contrast, Reynolds and Joy (1998) note that “the Kaibab Plateau was spared the extensive logging that occurred elsewhere on the Colorado Plateau and Southwest during the railroad logging era,” experienced single tree selective cutting from the 1920’s to the 1960’s, a small amount of clearcutting in the late 1960’s and 1970’s and intensive even-aged management from the early 1980’s to 1991. Thus, although the Kaibab Plateau was not spared from forest management, it experienced considerably less logging than other areas in the Southwest, including the Apache-Sitgreaves National Forest.

Not surprisingly, the two studies produced substantially different results for a number of important demographic parameters (Table 1). Significantly, goshawks on the Apache Sitgreaves had substantially lower adult female survival than goshawks on the Kaibab Plateau (.75 compared to .866).

Table 1. Results from two demographic studies of the northern goshawk.

Parameter	Kaibab	A-S
Number of territories studied	107	44
Mean occupancy	77%	68%
Mean nesting activity rate	50%	48%
Mean nest failure rate	21%	31%
Fledglings/successful nest	1.75	1.87
Adult female survival	.866 SE .051	.80 +/- .5
Lambda	N/A	.87 +/- .04 95% CI

² We have also included data up until 1998 from Reynolds (1999) for comparison with Ingraldi (1998).

According to a sensitivity analysis performed by Ingraldi (2001), adult female survival influences goshawk population trend more than any other parameter and indeed Ingraldi found that based on his estimate of low female survival, goshawks on the Apache-Sitgreaves National Forest had a high likelihood of extinction in the absence of immigration:

“If the demographic parameters I observed over the past seven years were to persist, my model suggests that northern goshawks will not continue to occupy the Apache-Sitgreaves National Forest without immigration of birds into the study area.”

Of-course, direct evidence is lacking to test that lower adult survivorship on the Apache Sitgreaves National Forest compared to the Kaibab Plateau relates directly to differences in habitat condition, but this is clearly the most plausible hypothesis. Ingraldi (1998) states:

“I observed lower survivorship rates for adult females than did Reynolds and Joy (1998) on the Kaibab Plateau during 1991-1996. This difference may be due to more favorable weather conditions in the early 1990’s, larger areas of forest stands with old-growth attributes on the Kaibab Plateau, or that there was a greater proportion of larger trees on the Kaibab Plateau.”

In conclusion, the only two intensive studies of goshawk demography had substantially different results that potentially correspond with recognized differences in habitat quality related to logging. Although more study is required to determine the role of habitat loss in the observed differences between the two goshawk populations, the fact that goshawks are declining at a substantial rate on the Apache-Sitgreaves National Forest where there has been extensive forest management, in combination with other evidence that logging harms goshawk populations, indicates that there is substantial cause for concern for the status of the goshawk.

CBD-19

Taken together, studies showing the goshawk selects forests with large trees and high canopy closure, studies showing reduced occupancy, productivity and density in response to logging, and a study showing the goshawk is faring poorly on at least one national forest in the Southwest all suggest that the goshawk requires substantial protection from logging across the landscape. The DEIS fails to fully consider this information or to provide alternatives that address these concerns.

f. The U.S. Forest Service failed to evaluate considerable information on the status of the goshawk in Southwest forests.

In addition to all of the studies on the habitat requirements of and impacts of logging on northern goshawks, the DEIS fails to discuss or evaluate information on the status of the goshawk in Arizona and New Mexico. Some relevant studies include Reynolds and Joy 1998, Ingraldi 1999, Ingraldi 2001, and Joy 2002, as well as unpublished data from Reynolds. There has been no comprehensive, region-wide monitoring program that includes searching for newly established nests, determining reproductive success, and goshawk dispersal and distribution, and it is uncertain that any of the individual national forests have implemented forest-wide programs to survey or monitor northern goshawk abundance and/or reproductive success. Nonetheless, there

CBD-20

has been a considerable data collected in developing ecological assessments and environmental impact statements for forest projects in numerous national forests throughout the region, and many of the national forests (for example, Coconino, Kaibab, and Apache-Sitgreaves National Forests) have programs (in the case of Coconino National Forest, in conjunction with Northern Arizona University) to monitor known PFAs and gather annual data on goshawk abundance and nesting. Viewed individually and collectively across the region, these data provide extremely valuable information on the status of the goshawk in the Southwestern forests, and indicate a serious need to evaluate the management.

Furthermore, recent large-scale events such as the Rodeo-Chediski Fire of 2002 and widespread incidence of bark beetle infestations in numerous forests along the Mogollon Rim have had significant ecological effects on the forests, and potentially significant effects on goshawk populations. For example, it appears that as many as half of all PFAs within the Apache-Sitgreaves National Forests were within the fire boundary of the Rodeo-Chediski Fire (Personal communication with Michael Ingraldi, Arizona Game and Fish Department). The management strategy needs to be evaluated in light of these recent events, with consideration of changes to the forest structure at the stand and landscape scales, and the implications for the overall viability of the goshawk population region-wide.

CBD-21

g. The U.S. Forest Service's claim that the MRNG mimics natural conditions and creates the maximum amount of old-growth ignores considerable science demonstrating that stand-replacing events were rare in ponderosa pine ecosystems and fails to consider alternative approaches.

In the face of information that goshawks do in fact select mature and old-growth forests in the PFA and foraging area, the DEIS adopts a novel argument for justifying managing the landscape as a mosaic of vegetation types, including those not selected by the goshawk. The DEIS now argues that mature and old-growth forests can't be sustained on more than 40% of the landscape and that this amount is within the natural range of variability for southwestern forests:

“While recognizing the importance of mature and old forest to goshawks and many of their prey, the actual recommended amount of mature and old forests in RM 217 was determined by the growth dynamics of forests. Based on forest dynamics, the maximum amount of mature and old forest (to 240 years) in a sustaining forest landscape is 40 percent (20 percent in mature, 20 percent in old forest) (Reynolds et al. 1992)... The recommendations in RM-217 would result in large-scale forest composition and structure that is consistent with our knowledge of the historic range of variability of the forests in the Southwest. Such forest structure could be reliably sustained over time. Forest composition and structure resulting from the recommendations contained in Alternative D would be much more difficult to sustain.”

CBD-22

The above conclusion is not supported by reference or analysis. A careful examination of Reynolds et al. (1992), the only reference for the above conclusions, finds no statements or analysis that 40% is the maximum amount of old-growth that can be sustained or that this is within the natural range of variability for Southwest forests.

Our review of the literature finds no support for the statement made in the DEIS that “the maximum amount of mature and old forest (to 240 years) in a sustaining forest landscape is 40 percent .” Contrary to this assertion, Reynolds et al. (1992) states that “under pre-settlement conditions, catastrophic crown fires were apparently rare.” In the absence of stand replacing fires, there is no other mechanism that would result in 60% of the landscape to be in early and mid-seral conditions. In fact, our review of the literature found that old growth forests historically occupied as much as 60-80% of the landscape (Rixon 1905), with average tree sizes of ponderosa pine greater than 19 inches diameter (Rixon 1905, Lieberg et al. 1905). Also, there is no lack of peer-reviewed articles that state that the ponderosa pine forests in the Southwest were occupied by forests with large trees with relatively dense canopy over and open understories, maintained by frequent, low-intensity fires (Covington and Moore 1994, Swetnam and Baison 1995, Fule et al. 1997).

CBD-23

CBD-24

5. Conclusion

We are disappointed by this latest effort by the U.S. Forest Service to comply with its NFMA mandate to protect the northern goshawk, and by its continuing insistence to turn a blind eye to what just about everyone else can see—that the bird is in trouble, is losing its habitat, and that the solution offered by the agency does not accomplish the objectives the agency at least pretends to have. The agency continues to ignore the important science, and continues to frame the problem in its self-serving way as a dispute about whether the goshawk is a specialist or a generalist even as its own timber planners place logging units in old growth forest. The current standards are all but ignored but the agency still pretends—without a shred of analysis to show it—that its plan will create “the maximum amount of mature and old forest” that is possible.

The agency must return to the drawing board, conduct a real review not of the literature but of the goshawk populations that inhabit the landscape under the agency’s control, and then propose a strategy that conforms to what the agency learns in this review. In the meantime, it should start treating the current goshawk standards as if they mattered.

CBD-25

A full bibliography of the documents cited here follows; we have provided attached to this letter hard copies of nearly all of the documents we have cited that were not also cited by the Forest Service in its analysis.

Sincerely,

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CBD-1

Mounting evidence suggests that goshawk reproduction (Salafsky 2004, Salafsky et al. 2005) and survival (Wiens 2004) are related to total prey abundance. In rare cases (Younk and Bechard 1994), one or two prey species may be so abundant that goshawk reproduction and survival is supported by a less diverse (fewer species) suite of prey. However, in most cases it appears that the prey abundance needed to support goshawk reproduction and survival is available only if there is a wide diversity of prey species. A wide diversity of prey also likely protects goshawk reproduction and survival in years when the population of some prey species declines. The MRNG fully recognized the importance of a diverse suite of prey for goshawk viability (Reynolds et al. 1992, p 12).

The MRNG and 1996 amendment defined sets of desired forest conditions based on goshawk and their prey's habitat relationships. Some prey (e.g., rabbits, ground squirrels, grouse, band-tail pigeon; see Reynolds et al. 1992, Appendix 3) require openings. Pre-settlement southwest ponderosa pine and mixed-conifer forests typically had many small openings around groups of trees. Many of these openings have filled in with trees due to lack of fire. The MRNG recommended restoring these openings (using active management such as tree removal and return of fire). Restoring openings improves the health (growth and productivity) of trees within groups and restores the diversity of habitats for goshawks and their prey. The MRNG recommended small group regenerating cuts (limited to a group of trees) to create a landscape-level balance among the six VSS classes. At any time, these created openings should not exceed 10 percent of the total area supporting groups of trees. Restoring small openings around grouped trees improves forest productivity by restoring the grass/forb/shrub habitats and decreasing competition among the trees. Improved forest productivity benefits the entire goshawk food web (Reynolds et al. 1992).

CBD-2

The "Draft Supplement to the Final Environmental Impact Statement" (DSFEIS) was prepared in accordance with the opinion set forth by the Ninth Circuit Court. The summary of the DSFEIS states, "The Forest Service, Southwestern Region, is preparing a 'Supplement to the Final Environmental Impact Statement (FEIS) for Amendment of Forest Plans in Arizona and New Mexico' to disclose, review, and assess scientific arguments challenging the Agency's conclusions over the northern goshawk's habitat preferences" (USDA-FS 2004).

The summary continues to define its scope by stating "The Supplement to the FEIS is being prepared in accordance with an opinion filed November 18, 2003, by the Ninth Circuit Court of Appeals (CV-00-01711-RCB) which held that the FEIS failed to disclose responsible scientific opposition that was addressed in the project record. This supplement to the FEIS will address the issue of scientific arguments over the northern goshawk's habitat preference and update the "FEIS for Amendment of National Forest Management Plans in the Southwestern Region" (USDA-FS 2004). The scope of the DSFEIS was purposely defined to respond to the court's opinion, and does so.

CBD-3

The Forest Service has conducted research to determine whether goshawk populations are stable or not (e.g., Kaibab NF, Klamath NF, San Juan/Rio Grande NF, Tongass NF). None of this

research has yet clearly demonstrated what kind of habitat is best for sustaining goshawk populations. However, this is the principal objective of a 14-year study of the goshawk population on the Kaibab Plateau, an objective that has proven to be a very complex problem because goshawk populations are affected not only by the availability of forest habitats but also by the availability of food. Each species of goshawk prey is, in turn, affected by the abundance of their habitats, the quality of which varies according to drought versus wet periods (Salafsky 2004). Most goshawk studies have been short term (< 10 years). Short-term studies of management effects on goshawks cannot detect the full range of variation in goshawk vital rates nor tease-out how management affects the complex interactions among the various factors that limit goshawk population's such as vegetation structure, food, predators, competitors, weather, and disease (Reynolds et al., in press b).

The goshawk is considered a "habitat generalist" because it occupies, nests, and survives in many forest and woodland habitats. In contrast, "habitat specialists" (e.g., pygmy nuthatch, Abert's squirrel in ponderosa pine forests) occupy one or a few types of habitat only. The goshawk occurs and breeds in nearly all of the many North American forest and woodland types, forages in deep forests and woodlands, but also forages along opening edges, and into openings (Squires and Reynolds 1997, Reynolds et al., in press b). This wide diversity of habitats appears a great deal to be related to where goshawks hunt for food; while many goshawk prey occur in mature and old forests, others occur in younger forests and forest openings. In canopied forest types (aspen, ponderosa pine, Douglas-fir, spruce-fir), a certain structure of vegetation is more suitable than others for goshawk foraging. This structure includes subcanopy space and abundant tree hunting perches, characteristics found more often in mid-aged to old forests. This structure is important to goshawks because in canopied forests, it is in the subcanopy space where they nest and hunt.

Goshawks occupying canopied forests may be considered vegetation structure specialists; however, even in canopied forests, goshawks hunt edges and into openings (Reynolds et al. in press b). Thus, the descriptor "structural specialist" does not always fit. Nonetheless, the MRNG suggested that, within canopied forests, as much of a landscape as can be sustained should be in mid-aged (VSS 4) to old forest (VSS 6). This amounts to about 60 percent of the forested landscape with the desired vegetation structure (Reynolds et al. 1992).

Finally, a review of goshawk literature (Reynolds et al. in press b) clearly demonstrated that goshawks occupy, nest, and survive in managed forests.

CBD-4

The Council on Environmental Quality (CEQ) regulations at 40 CFR 1502.9(b) state: "Final environmental impact statements shall respond to comments as required in Part 1503 of this chapter. The Agency shall discuss at appropriate points in the final statement any responsible opposing view which was not adequately discussed in the draft statement and shall indicate the Agency's response to the issues raised."

In addition, the CEQ regulations state at 40 CFR 1502.2(c): "Environmental impact statements shall be kept concise and shall be no longer than absolutely necessary to comply with NEPA and with these regulations."

In keeping with the intent of the CEQ regulations, the Agency has reviewed and assessed scientific literature, including opposing scientific views, in a clear and concise format. The

Agency has kept with the Court's opinion in that it "disclose responsible opposing scientific opinion and indicates its response in the text of the final statement itself."

CBD-5

As stated in response CBD-2, the Agency has prepared a supplement to the FEIS that is in accordance with the opinion set forth by the Ninth Circuit Court's November 18, 2003, opinion. In doing so the Agency has reviewed and assessed, within the body of a supplemental FEIS, current scientific materials that weigh any number of issues surrounding the current state of northern goshawk and its habitat requirements.

Having reviewed and assessed in excess of 450 northern goshawk related literature citations, the Agency has met the requirements of 40 CFR 1502.22 to provide "a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment."

CBD-6

Regional tree data from ponderosa pine stands does not support the contention that trees less than 12" are "in short supply" and that trees over 16" are "rare." Even the statement that trees greater than 24" have "vanished" from many areas of the Southwest is not supported by the facts (refer to following graph).

A comparison between 1999 regional forest inventory and analysis data and historic regional stand data (Woolsey 1911) dating back to the early 1900s indicates that there are excesses above historic ranges in all size classes region-wide up to the 23-24.9" size class (refer to following graph). There exists a slight deficit from historic levels in the 23-24.9" class, but excesses above historic levels exist above 25". The slight deficit below historic levels in the 23-24.9" class is less than .3 trees per acre, or a tree every 3 acres.

Establishment of a stand-specific diameter cap may ensure the retention of larger trees at the stand level, provided the diameter cap was based upon tree data from that stand. However, establishing a region-wide diameter cap: (1) fails to consider the unique set of biological and social issues associated with stand-level treatments; (2) would severely limit the Agency's ability to achieve site-specific management objectives; (3) fails to consider region-wide data that show no real deficit in the number of large trees over historic levels; and (4) fails to recognize thinning treatments that emphasize thinning-from-below will not result in a decrease in the number of large trees on the landscape over time. It is on this basis that the Agency concludes that such an alternative is not reasonable and feasible.

Dia. Classes (inches) →	1.0 2.9	3.0 4.9	5.0 6.9	7.0 8.9	9.0 10.9	11.0 12.9	13.0 14.9	15.0 16.9	17.0 18.9	19.0 20.9	21.0 22.9	23.0 24.9	25.0 26.9	27.0 28.9	29.0 +
Survey Date	→														
1999	80.85	56.53	39.56	29.92	21.42	14.50	8.96	5.7	3.55	2.15	1.54	0.91	0.50	0.40	0.45
1985-87	84.03	58.87	45.85	29.83	18.27	11.71	7.28	4.39	2.91	1.82	1.21	0.82	0.50	0.30	0.35
1966	88.42	48.32	28.49	17.84	11.28	7.05	5.12	3.72	2.63	1.70	1.22	0.87	0.62	0.44	0.51
1910	N.A	N.A	3.44	2.26	2.03	1.79	1.45	1.43	1.41	1.19	1.20	1.20	0.50	0.40	0.37

Ponderosa pine stands on non-reserved lands (trees/acre by size class)

The 1910 survey did not include trees less than 5" in diameter

Data compiled by Jeff Hogg



CBD-7

As stated in response CBD-2, the Agency has prepared a supplement to the FEIS which is in accordance with the opinion set forth by the Ninth Circuit Court’s November 18, 2003, opinion. In doing so the Agency has reviewed and assessed, within the body of a supplement to the FEIS, current scientific materials that weigh any number of issues surrounding the current state of northern goshawk and its habitat requirements. The supplement to the FEIS does not propose to adjust or alter the standards and guidelines currently in place and incorporated into each national forest plan (Alternative G) or the standards proposed under any of the other alternatives analyzed and displayed in Appendix E of the original EIS.

CBD-8

The development of the Goshawk standards and guidelines took several years of research and work by a scientific committee composed of notable scientists involved in goshawk population and habitat research. This work incorporated literally hundreds of research papers into the development of the goshawk guidelines. The research and the guidelines themselves are based on sound research, best available science, and extensive forest stand modeling. Statements questioning the efficacy of the goshawk guidelines are unwarranted without substantive documentation to support such statements.

CBD-9

Many studies of habitats used by foraging goshawks show that goshawks use a variety of habitat types, forest ages, including edge, riparian, and openings, and that goshawk hunting is not limited to old-growth forests (see DSFEIS, Appendix I). None of these studies unequivocally showed that goshawks would be harmed by the desired forest conditions described in the MRNG. In fact, growing trees long enough to restore mature and old forests, as specified in the MRNG, is predicted to benefit goshawks (see response to CBD-3). The desired forest conditions identified in the MRNG (i.e., groups of trees, interspersed of different-aged groups of trees (VSS), and openings) are, in fact, characteristics that resulted from pre-settlement natural disturbances (mostly fire) and tree establishment and growth processes (Pearson 1950 p 121, Reynolds et al. in press a).

CBD-10

All goshawk studies cited in Table 1 (p. 8, CBD) show that they used forests with less than 53 percent canopy closure. This level of canopy closure is representative of open forests, suggesting that goshawks can in fact occupy, survive, and breed in open forests. While most of the studies cited were conducted in ponderosa pine, goshawks in some of the studies used pinyon-juniper woodlands (Stephens 2001, Drennen and Beier 2003), a vegetation type characterized by open conditions (widely spaced trees) with relatively short trees and little or no subcanopy space. Goshawk hunting in these woodlands was, therefore, likely limited to the openings between trees.

CBD-11

“Opportunistic behavior” as used in the MRNG was not defined as “using habitats according to their availability” (see CBD p. 10). Rather, opportunistic behavior was defined operationally as the range-wide use of a wide variety (forests, shrublands, tundra) of habitats by nesting and wintering goshawks (see Reynolds et al. in press b).

CBD-12

The MRNG described the landscape mixes of habitats (using VSS as a classification system) for goshawks and many of their prey species. The desired openings are mostly small (< 1 acre; see Reynolds et al. in press a), and the groups of mature and old forests (VSS 5 and 6) have canopy cover greater than 40 percent (in VSS 5 and 6, the desired interlocking nature of the tree crowns will provide essentially closed canopies). The small openings around groups of trees resemble the pre-settlement forest conditions, which, as shown in the MRNG, benefit the goshawk and its prey species. In presettlement forests, these habitat conditions were created and maintained by natural disturbances (mostly low intensity fire). Currently, these conditions have been lost by management that included large area, intensive tree cutting (e.g., seed-tree, shelterwood) and fire suppression. As a result, much of the natural habitat diversity found in presettlement forests has been lost, including old trees and openings. The desired forest conditions described in the MRNG require a restoration of the natural habitat diversity, which is likely to be restored only by active forest management (restoration of fire, mechanical treatments that mimic the effects of fire). The small openings between tree groups fragment forests no more than the presettlement forests were naturally fragmented.

CBD-13

In the Bright-Smith and Mannan (1994) study, 8 of the 11 goshawks with sufficient numbers of radio-telemetry relocations used the canopy closure categories in proportion to the occurrence of each category. Six of the 11 goshawks used the edge category randomly. Only 1 of the 11 goshawks used the habitat diversity category non-randomly (Bright-Smith and Mannan 1994). This study, as well as the Hargis et al. (1994) and Good (1998) studies, showed a wide range of habitat use by individual breeding goshawks—some individuals use all canopy closure classes and some do not, some use edges and some do not, some use the full range of habitats within their home range and some do not.

What were not determined in these studies were the reasons why each goshawk used their habitats in the manner in which they did. Goshawks feed on a wide variety of prey species (typically 10-30 species; Reynolds et al. in press a), and these prey occupy a diversity of habitats (from openings to old forests; see Reynolds et al. 1992). It is not surprising, therefore, that hunting goshawks visit a wide range of habitats. However, there are typically differences in dietary preference among individuals in a raptor population, and, as well, differences in the habitat compositions on each goshawk territory. These differences alone could result in the variation of habitats used by the individual goshawks noted above.

Salafsky (2004) showed that food is critically important for reproduction in goshawks; without sufficient food, goshawks do not lay eggs. Salafsky (2004) also showed that it was the combined abundance of all prey species (total prey abundance) that was important for reproduction, especially during years when the abundance of one or more prey species was low—no single prey species was abundant enough to support reproduction in goshawk. Habitat quality for goshawks is, then, likely tied to the availability of a diversity of habitat and associated prey species.

The MRNG (Reynolds et al. 1992) and Reynolds et al. (1996) suggest that the desired diversity of habitats for a forest type be based on the natural range of variability of each forest type occupied by goshawks. It was reasoned that this natural diversity of habitats would be more likely to support viable goshawk populations (through both wet and drought years) than forests lacking diversity. Implementation of the MRNG restores the natural variation in habitat diversity lost or reduced in past management. This includes a restoration of mature and old forest age classes and the small openings between groups of trees that have been filled in by trees since fire suppression. Landscapes restored in this manner will resemble the forest conditions that persisted for many thousands of years and to which native goshawk prey species have adapted.

CBD-14

The MRNG and the 1996 amendment recommend a minimum canopy cover of 40 to 60 percent in post fledging areas and 40 percent in foraging areas in mature and old forest vegetative structural stages (VSS) in ponderosa pine forests (recommended canopy cover is higher in mixed-conifer and spruce-fir forests). The MRNG also recommend that trees in VSS 4, 5, and 6 (both post-fledging areas and foraging areas) have interlocking crowns. Interlocking crowns in the tree groups, in effect, will afford > 60 percent canopy cover. Managing to a minimum of 40 percent will not reduce a stand or forest to an average of 40 percent unless all the forest is exactly at 40 percent.

CBD-15

The specific logging treatment effects on goshawk occupancy and reproduction that were investigated by Crocker-Bedford (1990) and Ward et al. (1992) were, for the most part, the removal of most large trees in large areas (20-50 acres). Nothing resembling this kind of past forest treatment occurs during implementation of the MRNG. In fact, implementing the MRNG and the amendment will restore these harvested areas to forest conditions that occurred before they were cut—prime habitat for goshawks and their prey species. The same is true for the LaSorte et al. (2004) study, also conducted on the Kaibab Plateau. The Finn et al. (2002 a,b) and Patla (1997) studies were conducted in considerable different, non-Southwest, forest types.

CBD-16

Management prescriptions in the MRNG and the 1996 amendment were intended to restore the natural pattern of Southwestern conifer forests—a pattern that has been greatly changed by past even-aged forest management prescriptions (e.g., seed-tree, shelter wood, overstory removal harvests) and other management (e.g., fire suppression). Forest management prescriptions typically created large (e.g., >30 acres) openings by removing the large tree components, which reduced the abundance of some important goshawk prey species (Reynolds et al. 1992).

Both the desired forest conditions described in the MRNG and the natural pattern in Southwest conifer forests are comprised of small groups of similarly-aged trees with interlocking crowns (Reynolds et al. 1992). The interlocking nature of the tree crowns allows for a very high level of canopy cover (>60 percent) within the older ages classes (VSS 5 and 6). Each group of trees is surrounded by a small opening, which allows the spread of tree roots into the open areas where there is little competition. Reduced competition allows for more rapid growth of trees and earlier attainment of the large tree forest age class (VSS 6). Small openings and older forests (VSS 1 and VSS 4-6) are conditions that improve goshawk prey populations and a goshawk's accessibility to prey (Reynolds et al. 1992, Reynolds et al. in press a, b).

The MRNG also recommended a high level of interspersed tree groups of different ages (VSS) to benefit several prey species. Thus, the desired conditions consist of all forest age classes (VSS) in close proximity, a condition also often occurring in natural (presettlement) forests (Pearson 1950).

Much of the North Kaibab Ranger District has been managed (from approximately 1960-1991) with seed-tree, shelter wood, and overstory removal harvests. As a result, much of the district has many areas with few large trees. These were the conditions that prevailed during studies on the North Kaibab Ranger District by Crocker-Bedford and Chaney (1988), Crocker-Bedford (1990), Ward et al. (1992), and LaSorte et al. (2004). The management prescriptions in the amendment are intended to restore the natural all-age forests that existed on these areas before harvests, thus improving habitats of all plants and animals in the goshawk food web.

CBD-17

In 14 years of intensive surveys for nesting goshawks on the 1,730 km² Kaibab Plateau (North Kaibab Ranger District and the Grand Canyon National Park-North Rim), Reynolds and Joy (in press) and Reynolds et al. (2005) estimated (based on 107 and 121 known nesting territories, respectively) that the potential maximum numbers of territories was 145 and 150. These estimates result in one nesting territory per 1,192 ha and one territory per 1,153 ha, respectively—

very close to the Crocker-Bedford and Chaney (1988) estimate (1.1 pairs/1,000 ha). Nearly all of the North Kaibab Ranger District had been harvested (single tree harvests before the 1960s; clearcut, seed tree, shelter wood, and overstory removal after the mid-1960s; Burnett 1991) prior to all the above studies.

However, the Grand Canyon National Park had not been tree harvested and the estimated density of goshawk territories there was not significantly different from the density of territories on the North Kaibab Ranger District (Reynolds et al. 2005). Thus, the supposition that nesting territories and breeding goshawks occur at higher densities in unlogged areas is not always supported.

CBD-18

Reynolds et al. (2005) report the difficulty of finding and monitoring breeding goshawks determined during 12 years of intensive mark-recapture study of nesting goshawks on 121 territories. This difficulty stems from their elusive behavior, their complex forest habitats, and their annual frequent use of many widely-dispersed alternate nests within their breeding territories. Because not all goshawks breed every year (only breeding goshawks can be detected with reliability), as many as 8 years of repeated searching is needed to unequivocally classify areas as “unoccupied” by territorial breeding goshawks (Reynolds et al. 2005).

Further, alternate nests of goshawks can be more than 1.5 miles apart and between 55-76 percent of goshawks laying eggs in a year moved to an alternate nest (Reynolds et al. 2005), making the monitoring of goshawk reproduction and other vital rates difficult. A review of the goshawk literature makes it apparent that few studies of breeding goshawks have been conducted with the necessary sampling effort to make reasonable comparisons with the densities and vital rates reported on the Kaibab Plateau (Reynolds and Joy in press, Reynolds et al. 2005).

CBD-19

As discussed above, Southwestern forests have been greatly changed by past forest management. Implementation of the 1996 amendment and the MRNG will restore the changed forests, benefiting the goshawk and members (plant and animal species) in its food web (see Salafsky 2004 for the importance of prey abundance in goshawk reproduction). Once the desired forest conditions are attained (which may take decades depending on differences between existing and desired conditions), 40 percent of landscapes will consist of mature and old trees with canopy cover exceeding 40 percent (likely to be > 60 percent given the interlocking crown requirement) (Reynolds et al. 1992). Not implementing the MRNG in these changed forests is more likely to be detrimental to goshawk viability (Reynolds et al. in press a).

CBD-20

The FSFEIS is being prepared to display, discuss and disclose scientific arguments and information which is in opposition to the findings in the original FEIS which are based on the MRNG (Reynolds et al. 1992). Reynolds and Joy (1998) demonstrated goshawk productivity can vary widely by year, while nest or territory occupancy remains fairly stable. Boyce et al. (2005), has demonstrated that much of the goshawk survey data, often used to show population trends is invalid, based on the number of attempts at locating nest sites.

National forests in the Southwestern Region have been monitoring northern goshawks for over 10 years. Beginning in 1991 a standardized protocol became available for conducting goshawk surveys. This protocol included standard procedures for timing, intensity, and duration of goshawk surveys. Data has been summarized for each national forest in the Southwestern Region beginning in 1991, and ending in the 2004 field season. As reported in Reynolds et al. (2003), goshawk productivity on many national forests in the region was down during the drought. The summarized information is reported by post family-fledgling area. The post fledging area is described in the MRNG (Reynolds et al. 1992, p 13). Currently all 11 national forests including 44 ranger districts, in the Forest Service's Southwestern Region have collected nesting information on the northern goshawk (See Appendix AM).

CBD-21

From 1985 to 2002, wildfires burned approximately 1,678,000 acres in the Southwestern Region. These acres include vegetation types comprised of alpine tundra, subalpine forest, mixed conifer forest, ponderosa pine forest, several woodland types, and mountain and desert grasslands. Of the approximately 1.7 million acres burned, 6 percent burned at high intensity. Implementing the MRNG (Reynolds et al. 1992) at the landscape level helps to reduce the risk of future wildfires, deter crown fires, and lessen the effect of wildfire by widening the canopy in foraging areas and protecting nesting territories.

CBD-22

The MRNG had a long-term planning horizon and recognized that forests are dynamic, changing through plant establishment, growth, death, succession, and natural and anthropogenic disturbances (Reynolds et al. 1992, Reynolds et al.). An objective of the MRNG was to sustain goshawk and prey habitats in each goshawk breeding territory and, ultimately, in entire landscapes. Because of the dynamic nature of forests, the MRNG recognized, while VSS 2 and 3 were of little value to nesting and foraging goshawks, their presence was necessary for sustaining the very important VSS 5 and 6 within territories and landscapes.

In other words, the MRNG found, a "balance of age classes" was necessary for sustaining the important VSS (1, 4, 5, and 6) through the long planning horizon. The data and justification for the amounts of the different VSS in landscapes, and the number of years required for trees to grow through each VSS, are presented in Appendix 5, Tables 1-5 in Reynolds et al. (1992). The mosaic of age classes was a desired condition based on among-age class needs of some important prey (e.g., Kaibab squirrel) (Reynolds et al., 1992) and was not "novel" when compared to the natural mosaic of age classes in presettlement Southwest ponderosa pine forests (see, Pearson 1950, figure 38).

Presettlement ponderosa pine forest landscapes typically contained many tree age classes but were visually dominated by the large diameter, mature and old trees. Because the MRNG and 1996 amendment restores the mature and old age classes as well as the interspersions of all VSS groups, the desired forest conditions closely resemble the natural old-growth ponderosa pine condition. The natural mosaic of age classes that maintained old growth in presettlement landscapes is the same mosaic recommended in the MRNG and 1996 amendment to sustain older, productive forest ecosystems that support the goshawk and its prey.

CBD-23

The contention that up to 60 to 80 percent of the landscape can exist as old growth and that pine forests in the Southwest were occupied by forests with large trees with relatively dense canopy and open understories (Covington and Moore 1994) and (Baison and Swetnam 1995) and (Fule et al. 1997) as referenced, depends upon the “scale” used to identify old-growth conditions. Just because large trees may dominate a landscape does not mean that the area meets the definition of functioning old growth. There is far more to functioning old growth than simply large trees.

There seems to be at least four different spatial scales being considered by individuals when talking about old growth: (1) the individual tree scale; (2) the group scale (sub-stand size areas as recommended in MRNG); (3) the stand scale; and (4) the landscape scale (multiple stands or large blocks). Unfortunately, when people discuss the merits of old growth, people are not always using the same scale.

If old growth is defined as a single tree (tree scale), old growth can occupy far more than 40 percent of the landscape. Individual old trees (tree scale) can exist in most or all forested stands across the landscape. The only place old trees might be deficit for some time would be in stand-replacement fire areas or areas logged where all mature trees have been removed. However, if “old growth” represents a defined forest area (group, stand, or large block), it is not possible to have 60 to 80 percent of the landscape as old-growth conditions on a sustainable basis.

The goshawk VSS distribution (MRNG) is based on six VSS size classes with age/size classes ranging from seedlings to old, mature trees. Each VSS or size class category spans approximately 40 years, assuming average tree growth rates in the Southwest. When ponderosa pine stands were modeled (RMYIELD forest model) factoring typical size-age relations, average growth rates, and average tree longevity (Richard Bassett and others – Regional Office- USDA-FS pre-1990), it was determined that there did exist a finite number of acres (group, stand, or block) or maximum percent of the landscape in old growth that could be supported by younger tree groups, stands, or blocks on a sustained basis.

When landscapes were modeled that contained more than 20-40 percent (VSS 5 and 6) old growth, there had to be fewer acres of VSS 1-4. The analysis showed that in the long term, any present day shortages of VSS 1-4 resulted in shortages of VSS 5 and 6 at some point in the future. This same finding applies when old growth is modeled at the tree scale. Some minimum number of younger trees were needed to support an optimum number of older trees within a stand. That number of younger trees must be larger than some optimum number of old trees because not all young trees survive until old age (the “inverse-J” distribution curve).

An example involving ponderosa pine may help clarify. For simplicity, assume that old growth equates to big, old trees, and that it requires that ponderosa pine trees reach 200 years of age before they take on old-growth tree characteristics. Based on data provided by such forest scientists as Pearson (1950) and Cooper (1960), assume average lifespan of ponderosa pine trees is ~250-300 years. Based on these assumptions, nearly two-thirds of the trees or 66 percent of the area must consist of trees less than 200 years of age to support old-growth trees (200-300 years of age). Furthermore, to sustain 33 percent of the individual trees or 33 percent of the area as old growth over time, the continual establishment of younger trees is critical. Any reduction in regeneration in order to retain a larger percent of the trees or area in old growth will eventually result in a decline of old growth below the optimum 33 percent level. The MRNG and amendment call for 40 percent of the landscape to be managed as VSS 5 and 6 with the other 60

percent of the areas to be distributed between the smaller size classes to support the continued existence of old growth over time.

Whether your scale is a single tree (tree scale), an even-aged group (group scale), an even-aged stand (stand scale), or an even-aged block (landscape or multistand scale), one must start out with a larger number of young trees, or a larger or equal number of smaller tree groups, smaller tree stands, or smaller tree blocks to support a desired number of large, old trees or large-tree areas. Table 2 of the “Draft Supplement to the FEIS” (pg 11) lists 20 percent of the landscape in VSS 6 (old growth) and another 20 percent in VSS 5 (mature forest) as a commonly agreed upon habitat component for the northern goshawk. The goshawk work by Austin (1993, p 42) also supports the 20 percent minimum threshold amount of closed-mature/old-growth habitat.

The difference between Alternative D and Alternative G (DSFEIS, pg. 32) is not over the total amount of old growth that can be sustained on the landscape, but whether old growth should be managed as large blocks (multiple stands) or managed as substand-size areas (VSS 5 and 6) as outlined in the MRNG (Reynolds et al. 1992).

CBD-24

See responses to CBD-22 and CBD-23

CBD-25

The FSFEIS is being prepared to display, discuss and disclose scientific arguments and information which is in opposition to the findings in the original FEIS which are based on the MRNG (Reynolds et al. 1992). Reynolds and Joy (1998) demonstrated that goshawk productivity can vary widely by year, while nest or territory occupancy remains fairly stable. The North Kaibab Ranger District has been implementing the MRNG for 8 years, harvesting an average of 4,372 MBF per year over an average of 2,380 acres per year under the management guidelines. During this time, territory occupancy has remained stable (Reynolds and Joy, 1998).

Your Community Voice in the Carson
Re: Draft Supplement to FEIS
Forest Plan Amendments - Comments

REC'D USDA
REGIONAL FORESTER'S OFFICE
SOUTHWESTERN REGION



OCT 08 2004

Oct. 6, 2004

Carson Forest Watch

Box 15 Llano, NM • 87543 • 505-587-28

Haw Foygen - Region 3 Forester
333 Broadway SE - USDA Forest Service
Albuquerque, N.M. 87102
SW Region

Dear Region 3 Goshawk Supplement Team,

on behalf of Carson Forest Watch the following
are comments on the Supplement to the Plan Amendments.

- 1) We support Alternative D because this alternative will provide the best habitat for recovery of many wildlife species, esp. Goshawk and Mexican Spotted Owl.
- 2) Please note that it is important to recover these forest species to healthy (+ viable) numbers, and not to merely manage for minimums, or to maintain current numbers + habitat.
- 3) The Forest Service's preferred alternative is unfortunately will not provide the large blocks of old and mature forest that Alternative D will provide. Because of this, we do not believe it will contribute adequately to →

CFW-1

CFW-2

CFW-3

The Relationship Between
Humans and Land

Land, then, is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals. . . . An ethic to supplement and guide the economic relation to land presupposes the existence of some mental image of land as a biotic mechanism. We can be ethical only in relation to something we can see, feel, understand, love, or otherwise have faith in.

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OCT 12 2004

R-3 FORESTRY
FOREST HEALTH

The recovery of goshawk populations across the Southwest.

4) Goshawk are an important indicator of healthy Ponderosa pine forest ecosystems and recovering this keystone species is critical to Ponderosa forest health. CFW-4

5) In northern New Mexico, esp. on the Carson National Forest (where we live adjacent to), goshawks also use mixed conifer & aspen stands as well as Ponderosa. and they also need large un-broken blocks of mature forest and closed canopy cover. CFW-5

Again - we support Alt. D to best provide protection for this old forest habitat. CFW-6

6) we caution that with the on-going drought and beetle kill of trees in the Southwest - any management needs to be very conservative, and to not manage for minimal habitat conditions.

7) Too much tree removal forest openings and reduction of canopy and basal area will only further heat up and dry out forest areas. This will increase drought effects and fire risk. Species such as goshawk (& spotted owl) need cool, dense, old forests for nesting and this is critical to successful fledging of young birds. (+ to fungi & truffles that goshawk prey depend upon) CFW-7

8) Alternative D best provides for this important component - which is critical to the continued survival of these important forest indicator birds of prey. CFW-8

Thank you.
Sincerely, Joe Berke for Carson Forest Watch.

CFW-1

The 1996 “Record of Decision for Amendment of Forest Plans” articulated the rationale for why Alternative G was the chosen alternative (USDA-FS 1996, p 6-7). Among others, Alternative G met the objectives of: incorporating standards and guidelines for Mexican spotted owl and northern goshawk into the Southwestern Region’s forest plans to guide site-specific project design; the standards and guidelines for old growth are compatible with requirements for Mexican spotted owl and northern goshawk and are consistent across the Southwestern Region; and standards and guidelines for the Mexican spotted owl are consistent with the Mexican Spotted Owl Recovery Plan.

In short, “Forest plan standards and guidelines in Alternative G are consistent with the Mexican Spotted Owl Recovery Plan and incorporate the intent of the scientific report known as “Management Recommendations for Northern Goshawk in Southwestern U.S.” Additionally, Alternative G establishes forage utilization standards for grazing ungulates and establishes old-growth management standards and guidelines that are consistent throughout the Southwestern Region” (USDA-FS 1996, p 7).

CFW-2

The MRNG, on which, in part, Alternative G is based, clearly agrees with this comment (Reynolds et al. 1992, p 30-32) and put forward the benefits to forest health, forest productivity, forest protection, and the habitat of many native plants and animals by achieving the desired forest conditions resulting through its implementation.

CFW-3

The desired forest conditions described in the MRNG closely resemble the presettlement Southwestern ponderosa pine forest landscapes. The natural mosaic of groups of young-to-old age classes that was responsible for maintaining old growth in presettlement landscapes is the same mosaic recommended in the MRNG to sustain the older, productive forest ecosystems that support the goshawk and its prey. Thus, the MRNG will provide large landscapes of forests that are visually dominated by mature and old trees and, because of their interlocking crowns, the groups of mature and old trees will have high canopy cover (Reynolds et al. 1992). Thus, implementing the MRNG should result in very large blocks of mature and old forests.

The Goshawk Management Guidelines propose that old-growth forest structure exist over 20-40 percent of the landscape as small one-half to 4-acre patches. Large blocks of “minimally managed” forest will continue to exist in the form of wilderness areas, steep forested slopes, and areas withdrawn due to soil, visual, archeological, and other social values.

Large blocks of old-growth are seldom if ever uniform areas of large, old trees. These blocks of old growth contain stand size or group size areas of various tree ages and sizes. All old-growth forests have at some time in the past been forests of young trees, and they will again support stands of young trees at some time in the future as a result of stand-replacing disturbance.

It is this continually shifting mosaic on the landscape that the authors of the MRNG recognize and want forest management practices to promote; a landscape where 20-40 percent of the area (groups, substands) consists of large, old trees and associated forest structures that qualify it as old growth, intermixed with the younger age classes needed to support continued old growth.

CFW-4

The northern goshawk is identified as a management indicator species (MIS) on five national forests (Apache-Sitgreaves, Coconino, Kaibab, Prescott, and Tonto) in the Southwestern Region. Management indicator species are selected to reflect the habitat needs for a majority of forest species. An indicator species is a plant or animal whose population change reflects a population change of other species within a group. Indicator species respond to habitat changes early or at low levels of stress and, therefore, are sensors of the effect of management activities that occur in various habitats. Management indicator species were chosen for given vegetation types, seral stages, and the vegetative components of the given habitat. The northern goshawk is but one species that can reflect habitat changes. For the six national forests that do not have the northern goshawk as an MIS, other species were chosen that better reflect changes in populations of other species that use a particular habitat type.

CFW-5

The desired forest conditions in the MRNG for southwestern mixed-conifer forests are very similar to the desired forest conditions for Southwestern ponderosa pine forests. Thus, implementing the MRNG should result in very large blocks of mature and old forests.

CFW-6

There are two schools of thought on how management activities should relate to natural disturbance events. One can either (1) back off from treatments until it can be determined just how much tree mortality might result from disturbance agents (stand-replacement fires, insects, and diseases), or (2) promote and expedite management actions to reduce the impacts of the disturbance agents outside their normal range of variability.

If the disturbance agent has been determined to be outside its natural disturbance levels and can be traced back to a lack of management actions or the wrong management actions, the best approach is to move forward with planned management actions to correct existing conditions; but a very important part of these activities is to closely monitor management actions to ensure the problem is not being made worse (adaptive management).

This same two-pronged approach can be applied in the treatment of wildland-urban interface (WUI). Do we back off from treating WUI until the current drought has ended and take chances with a stand-replacement fire during that time, or do we proceed now with treatments in WUI proactively to reduce the risk and hazard found in many of our WUI areas? Resource managers in the Southwest have decided that a “proactive” approach is better than a “wait-and-see” approach in WUIs. Although insect and disease epidemics alone are certainly not as life threatening as wildfires, the presence of insect and disease epidemics does directly influence fuel hazard conditions several years down the road. Most land managers have decided to take this same proactive approach to land management outside of WUI areas.

CFW-7

Southwest forests have been greatly changed by past forest management prescriptions (e.g., seed-tree, shelter wood, overstory removal harvests) and other management (e.g., fire suppression). Implementation of the MRNG will restore the changed forests, benefiting the goshawk and members (plant and animal species) in its food web (see Salafsky 2004 for the importance of prey

abundance in goshawk reproduction). Once the desired forest conditions are attained (which may take decades depending on differences between existing and desired conditions), 40 percent of landscapes will be in mature and old trees with canopy cover exceeding 40 percent (likely to be > 60 percent given the interlocking crown requirement) (Reynolds et al. 1992). Not implementing the MRNG in these changed forests is more likely to be detrimental to goshawk viability (Reynolds et al. a).

Fire behavior is strongly influenced by stand condition and structure as it relates to dead surface fuel loading, ladder fuels, and canopy fuels. The argument that opening a stand increases wind and drying out the site is a valid one. Fuels managers recognize that this is indeed a consequence of many fuels reduction treatments. However, many resource managers and scientists feel that the reduction in surface fuel loading (slash reduction), the removal of ladder fuels (increased crown base height), and the reductions in canopy fuels (reduced crown bulk density) outweigh the negative effects from increased wind and solar radiation that directly influences burn intensities (heat/unit area).

The Southwest suffers from a lack of moisture, not sunlight. Thinning has been shown to reduce the threat of drought on forest trees. Because water is limiting in the Southwest, reducing tree numbers can provide increased subsurface water to remaining trees. In this way, the remaining trees are better equipped to implement their natural defenses (overall tree vigor and sap production).

Opening a stand of trees to the wind and solar radiation may dry out surface soil layers, but the increased moisture available to tree roots (subsurface moisture) more than offsets the decline in surface moisture. The fact that moisture is limiting in the Southwest is a primary reason why many ponderosa pine stands in the past were more open than pine stands today. Fire exclusion, grazing, and selective logging have allowed for many ponderosa pine forest stands in the Southwest to become much denser than in the past. Because there are far more trees, all trees including the largest ones are placed under environmental stress for moisture, especially during a drought period.

CFW-8

The 1996 “Record of Decision for Amendment of Forest Plans” stated the rationale for why Alternative D was not the chosen alternative (ROD, pg. 6). Alternative D was not selected because it proposed northern goshawk direction that was more conservative than current scientific information warranted. If the need for a more conservative approach becomes apparent from monitoring of the species, some of the ideas generated in the development of Alternative D may become necessary. Contrary to some views, the bulk of monitoring and research data completed since 1996 has not indicated that a shift in management strategies for the northern goshawk is needed.



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

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REC'D USDA
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SOUTHWESTERN REGION

November 12, 2004

Mr. Harv Forsgren
Southwestern Regional Forester
Attn: Goshawk SEIS Team
333 Broadway SE
Albuquerque, NM 87102



NOV 18 2004

Re: Draft Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico.

Dear Mr. Forsgren:

The Arizona Game and Fish Department (Department) reviewed the Draft Supplement to the Final Environmental Impact Statement (SEIS) for Amendment of Forest Plans in Arizona and New Mexico. We appreciate meeting with the Forest Service on November 2, to discuss the purpose and intent of the SEIS and the future management of the northern goshawk. As you know, the Department provided comments on a number of documents relating to the goshawk management over the last fifteen years and continues to be dedicated to the management of this species.

The Department understands the Ninth Circuit Court of Appeals ruled that the Forest Service failed to disclose and discuss responsible scientific opposition to the conclusion upon which the Final EIS was based in accordance with NEPA and its implementing regulations. While the Department continues to have concerns regarding goshawk management implemented by the Forest Service, the point of this letter pertains to the Court decision, and clarification of the debate of which the SEIS addresses. We believe, as currently presented, the SEIS does not adequately describe, and appears to misrepresent the Department's concerns, issues, and viewpoints.

Within the SEIS, the Forest Service consistently states that the input from the Arizona and New Mexico state wildlife agencies and from the U.S. Fish and Wildlife Service is a "slight variation" from recommendations by the Goshawk Interagency Implementation Team (pg 2). We believe the goshawk management guidelines as presented by the Forest Service allow the creation of habitat conditions that may not support a sustainable population of goshawks. We have presented the scientific basis for our belief in previous communications and refer you to those documents.

AGFD-1

Mr. Harv Forsgren
 November 12, 2004
 2

The debate described on page 31 of SEIS maintains that the scientific debate has been stated in terms of degree to which the northern goshawk should be considered a habitat specialist or a habitat generalist. It is stated that only one of 180 documents reviewed by Reynolds (2004) showed the northern goshawk strictly using old-growth forest, therefore maintaining the position that goshawk are generalists. Forest management recommendations assume that the goshawk is a forest habitat generalist because goshawks occur in many different forest types. However, goshawks have evolved physical characteristics that enable them to hunt most efficiently in relatively mature, dense forest structures. Therefore, the Department considers the goshawk a forest habitat specialist that is associated with mature, dense forest structure in many forest types, during key life stages. As a habitat specialist, rather than a habitat generalist, loss of nest sites or suitable foraging habitat may limit goshawk population density and distribution. For clarification on our viewpoint, we synthesize again the main issues of the debate, including the Department's main concerns.

AGFD-1

Tree Density: The principal concern of the debate, now as it was then, is that the lower end of the prescribed tree densities is too low to support a viable population of goshawks, and that maintenance of patches of old trees in foraging areas are needed.

The Department largely agrees with the Forest Service on management of nesting areas and post fledging area (PFA's). We agree these areas are defined by stands of mature trees with tree densities that should support productive goshawk territories within the prescription (i.e., nest stands and PFA's are defined by relatively closed canopy).

AGFD-2

Our continued concerns and the basis of the debate relates to forest management at the foraging area level, which encompasses the great majority of goshawk habitat when compared to nesting areas or PFA's (90% of all managed habitat per pair is deemed foraging habitat). The SEIS as well as the RM-217 suggests that "the management recommendations for the foraging area are similar to the PFA". We disagree that they are similar in the key characteristics of tree density and maintenance of patches of VSS 5 and 6 trees. Our previous letters relative to the Final EIS and the GIIT have reiterated the need to adequately describe the management conditions necessary to maintain productive, sustainable goshawk territories. Forging area prescriptions, as currently proposed, allow management to create conditions in the name of goshawk management, which we do not believe will maintain goshawk use.

AGFD-3

Both Alternatives (D and G) require 20% of the foraging area be composed of mature trees, however Alternative G has no measure of tree density associated with it and allows for management of old growth "patches", "no matter how small". Without a concise definition of a "patch", the statement "no matter how small" can allow managing single old trees to meet requirements for VSS 5 and 6 within goshawk foraging habitat. As we have previously documented, goshawk habitat is not characterized by open stands of widely spaced trees with an occasional old tree, yet the proposed management guidelines allow creating this type of forest condition as goshawk foraging habitat. We have consistently recommended using the proposed PFA requirements for the foraging area prescription as well. We do not agree that this is only a "minor" change from the Forest Service's own recommendations, rather we believe it may be the difference between goshawk populations that persist and the decline of those populations.

Mr. Harv Forsgren
November 12, 2004
3

We do recognize a need to relax the requirements to manage areas outside of existing territories as goshawk habitat. The Forest Service has correctly identified a need to increase goshawk habitat. However, a consistent application of the prescriptions has resulted in conflicts with grassland and savanna restoration and with management for open habitat species, such as prairie dogs and pronghorn. We urge the Forest Service to incorporate some provision for avoiding conflicts with appropriate grassland and savanna restoration into the guidelines.

AGFD-4

Forest Management Application: Applying ponderosa pine habitat prescriptions to other vegetation types could result in stand densities outside the probable range of natural variability for those other vegetation types.

The prescription within the goshawk guidelines (RM-217) was developed for ponderosa pine forest type. We know that goshawk habitat incorporates many vegetation types such as mixed conifer, spruce fir, and woodlands. The Department believes that applying a ponderosa pine prescription to other vegetation types is insufficiently analyzed and could result in stand densities outside the probable range of natural variability for those other vegetation types.

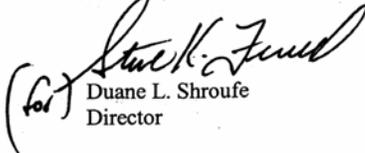
AGFD-5

The Forest Service has incorporated the text of the research cited in the lawsuit into the SEIS, however, we believe the Forest Service should also include our discussion of tree density and forest management application as the basis of the scientific debate within the SEIS. The Department is currently reviewing and compiling additional literature to be included in the Final SEIS, which will be forwarded to you in the near future.

AGFD-6

We appreciate the efforts by the Forest Service to meet with the Department and consider our interests and concerns with the development of the SEIS. If you have questions regarding this letter, please contact me or Bob Broscheid, Habitat Branch Chief, at (602) 789-3605.

Sincerely,


(for) Duane L. Shroufe
Director

DLS:rd:rm

cc: Bob Broscheid, Habitat Branch Chief
Ron Sieg, Regional Supervisor, Region II
Jon Cooley, Regional Supervisor, Region I

AGFD-1

The literature shows that, while the goshawk is clearly morphologically and behaviorally adapted to forests, their occurrence and/or reproduction are not limited to mature or old growth forests (Reynolds et al., b). In fact, evidence is increasing that food abundance is more often limiting than nesting habitat (Widen (1989), Reynolds et al. b), and that when food is abundant goshawks can successfully nest in many forest and woodland habitats including open habitats (e.g., riparian cottonwoods in upper Sonoran desert (White *et al.* 1965), and mountain shrub communities (Younk and Bechard 1994)), as long as there is a patch of trees where they can nest. Nonetheless, many important goshawk prey (e.g., jays, woodpeckers, tree squirrels) tend to be more abundant in older forests (Reynolds et al. 1992, Drennen et al. in press), and mature and old forests can also have a suitable structure for goshawks to successfully see, pursue, and capture their prey (Reynolds et al. a). Still, many nesting and wintering goshawks hunt in more open forests (ponderosa pine forests) and woodlands (pinyon-juniper communities) for prey (e.g., jackrabbits, ground squirrels) that occupy open habitats (Reynolds et al. a, b).

A review of the literature clearly shows that the goshawk is not limited to a single habitat, whether one defines that habitat from a compositional or structural viewpoint. On a continuum from habitat generalist to habitat specialist, research shows the goshawk is on the side of habitat generalist.

AGFD-2 & 3

In the MRNG and 1996 amendment, the main difference in the desired forest conditions for the post fledging area and foraging area is canopy cover, a minimum of which is specified only for the mature (VSS 5) and old (VSS 6) forest patches (groups). This difference (higher canopy cover in the post fledging area) can be achieved by managing for one or two more trees per group of VSS 5 and VSS 6. All other desired conditions for the post fledging area and foraging area are the same or nearly the same (Reynolds et al. 1992, p 22-30). Because trees within groups of VSS 5 and 6 in both the post fledging area and foraging area have interlocking crowns, canopy cover in both areas will typically exceed 60 percent (see CBD-16). It is impossible to have interlocking tree crowns (Reynolds et al. 1992) if trees are not in groups. The intent of the MRNG was to manage for groups of trees, not single trees. However, an occasional single tree is not excluded.

AGFD-4

The MRNG and 1996 amendment recognized the importance of maintaining open grassland and savanna areas. To do so, the MRNG clearly states not to include the natural open areas as part of the post fledging area (Reynolds et al. 1992, p 23, 26, and 27). The MRNG also recommended restoring (removing trees from) what used to be open areas around groups of trees. These small openings have been filled in with trees because of fire suppression. Open areas are important habitat for some goshawk prey (rabbits, hares, ground squirrels, grouse) and provide critical openings for the roots of the trees within groups (see CBD-1).

AGFD-5

The MRNG and 1996 amendment actually developed desired forest conditions for three Southwestern forest types: ponderosa pine, mixed-conifer, and spruce-fir. The desired forest conditions for the types differed because the suites of important goshawk prey, and the forest biology and ecology, differed among each of these types (Reynolds et al. a). The desired forest

conditions for each of these forest types are separately described on pages 22-30 in Reynolds et al. (1992).

The following 1998 table, which more accurately displays what was described in the 1996 amendment and MRNG, clearly shows the relationship between tree size and VSS class by cover type. Prior to this 1998 display, VSS 6 was not shown as a separate structural stage, but merely a special condition of VSS 5 that met established minimum old-growth, large tree standards. Note that the size criteria for each VSS class are the same regardless of forest type.

**Vegetative Structural Stages Classes by Forest Cover Types
Diameter and Cover Type Groupings as Modified in 1998**

Cover Types	VSS 1 Grass/Forbs/ Shrubs/ Seedlings	VSS 2 Saplings	VSS 3 Young Forest	VSS 4 Mid-Aged Forest	VSS 5 Mature Forest	VSS 6 Old Forest
1. Ponderosa Pine, Southwestern White Pine, Misc. Softwoods	0 – 0.9"	1.0 – 4.9"	5.0 – 11.9"	12.0 – 17.9"	18.0 – 23.9"	24"+
2. Blue Spruce, Douglas-fir, White Fir, Limber Pine, Bristlecone Pine	0 – 0.9"	1.0 – 4.9"	5.0 – 11.9"	12.0 – 17.9"	18.0 – 23.9"	24"+
3. Engelmann Spruce-Subalpine Fir, Engelmann Spruce	0 – 0.9"	1.0 – 4.9"	5.0 – 11.9"	12.0 – 17.9"	18.0 – 23.9"	24"+
4. Aspen, Cottonwood, Willow, Misc Hardwoods	0 – 0.9"	1.0 – 4.9"	5.0 – 11.9"	12.0 – 17.9"	18.0 – 23.9"	24"+
5. Pinyon-Juniper, Juniper, Rocky Mtn Juniper	0 – 0.9"	1.0 – 4.9"	5.0 – 11.9"	12.0 – 17.9"	18.0 – 23.9"	24"+
6. Gambel Oak, Mesquite	0 – 0.9"	1.0 – 4.9"	5.0 – 11.9"	12.0 – 17.9"	18.0 – 23.9"	24"+

Recognizing that some of the forest cover type species (pinyon-juniper, oak, aspen, hardwoods) were unable to achieve minimum tree diameters for the various VSS categories displayed in the above table, the VSS table was modified in 2000 by the Southwestern Regional Office of the Forest Service. (On February 3, 2000, Bryce Rickel and Keith Fletcher, R3 Wildlife Staff, and John Shafer and Pat Jackson, R3 Forestry Staff, met to discuss changes to the VSS rating system). It was agreed that changes were necessary in order for some of the cover types to be VSS rated properly.

**Vegetative Structural Stages Classes by Forest Cover Types
Diameter and Cover Type Groupings as Modified 3/2000**

Cover Types	1	2	3	4	5***	6
1. Ponderosa Pine, Southwestern White Pine, Misc. Softwoods, Douglas-fir, White Fir, Limber Pine, Engelmann Spruce-Sub-	0 – 0.9"	1.0 – 4.9"	5.0 – 11.9"	12.0 – 17.9"	18.0 – 23.9"	24"+

Cover Types	1	2	3	4	5***	6
alpine Fir, Engelmann Spruce, Blue Spruce, Bristlecone Pine, Corkbark Fir, Aspen						
2. Cottonwood, Arizona Cypress, Gambel Oak (tree form*)	0 – 0.9"	1.0 – 4.9"	5.0 – 9.9"	10.0 – 14.9"	15"+	N/A
3. Willow, Misc Hardwoods, Gambel Oak (shrub form**)	0 – 0.9"	1.0 – 2.9"	3.0 – 4.9"	5.0 – 6.9"	7"+	N/A
4. Pinyon-Juniper, Juniper, Rocky Mtn Juniper	0 – 0.9"	1.0 – 2.9"	3.0 – 4.9"	5.0 – 10.9"	11"+	N/A

<p>* Gambel Oak tree form exists on the following Forests in R3:</p> <ul style="list-style-type: none"> • Apache-Sitgreaves • Cibola (Magdalena & Mt Taylor districts) • Coconino • Coronado • Gila • Kaibab (south districts) • Lincoln • Prescott • Tonto 	<p>** Gambel Oak shrub form exists on the following Forests in R3:</p> <ul style="list-style-type: none"> • Carson • Cibola (except the Magdalena and Mt Taylor districts) • Kaibab (North Kaibab) • Santa Fe 	<p>*** For Forest Cover Type Groups 2, 3 and 4, there are only 5 VSS classes.</p>
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Recognizing that VSS was developed to primarily classify even-aged stands, a slight change was made in 2003 (Cassidy and Jackson) to the VSS output results. These changes did not alter the criteria outlined in the VSS table above for VSS classification. The change was as follows:

Stands that fail to achieve 60 percent+ of the total stand basal area within a floating 8" size class, are identified as uneven-aged (UNEV) in the stand database (FSVeg). The program first looks to see if 60 percent+ of the basal area falls within the 1-8" size class. If not, it next looks at the 2-9" size class, the 3-10", and so on. If no 8" class can achieve a minimum of 60 percent of the stand's basal area, the UNEV descriptor is applied.

Because many of the wildlife models used by the Forest Service require a VSS classification, an average VSS value for all stands is still generated. The uneven-aged "flag" in the stand database serves as a "heads up" that the stand average VSS may not reflect existing multistoried stand conditions on the ground.

Recognizing that a stand-average-VSS class in a multistoried stand may fail to display true stand structure, many silviculturists in the region have decided that it is more accurate to analyze VSS based on plot data rather than based on stand-average data. In some cases, VSS plot level data are used in determining the VSS percentages on an entire analysis area, not just in multistoried stands within the analysis area.

The MRNG (Reynolds et al. 1992, Table 1, p 7) provides recommended home range attributes for goshawk by three forest associations: (1) ponderosa pine, (2) mixed species, and (3) spruce-fir.

The home-range habitat is broken out by post fledging family area and foraging area. Stand attributes described under post fledging family area and foraging area include (a) VSS distribution, (b) canopy cover, (c) years to mid-age VSS 6, (d) opening size, (e) reserve trees, (f) snags, (g) down logs, and (h) woody debris.

The MRNG (Reynolds et al. 1992, Table 5, p 14) displays structural attributes by forest type for goshawk nest/roost habitat. Each forest association has its own unique set of minimum forest conditions that quantify stands as nest/roost habitat. The contention that ponderosa pine prescriptions are being applied to all forest types is not supported by management direction outlined in the MRNG and incorporated into the forest plans for the Southwestern Region via the 1996 amendment.

AGFD-6

Together with the MRNG (Reynolds et al. 1992), the original “Environmental Impact Statement for Amendment of Forest Plans,” and this “Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans,” the Agency has reviewed over 450 northern goshawk related materials that include peer reviewed scientific papers, published journal articles, masters’ theses, unpublished non-peer reviewed scientific papers, correspondence, and alternative views and scientific perspectives. Many of these documents include discussion and analysis of silvicultural practices and including tree density and forest management applications.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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San Francisco, CA 94105-3901

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SOUTHWESTERN REGION

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EAP/WSA STAFF

November 12, 2004

Harv Forsgren, Regional Forester
c/o Goshawk Supplement Team
USDA Forest Service, Southwestern Region
333 Broadway SE
Albuquerque, New Mexico 87102

Subject: EPA Comments on the Draft Supplemental Environmental Impact Statement for Southwestern Region Amendment of Forest Plans, Implementation, Updated Information, Standards and Guidelines for Northern Goshawk and Mexican Spotted Owl, AZ and NM (CEQ # 040457)

Dear Mr. Forsgren,

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced draft supplemental environmental impact statement (DSEIS) pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

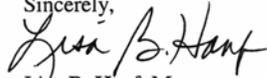
EPA supports the beneficial updates of Land Management Plans to ensure consistency with the U.S. Fish and Wildlife Service (FWS) Recovery Plan for the Mexican Spotted Owl. This document serves as a supplement to the Final EIS for the Southwestern Region Amendment of Forest Plans and includes information on the opposing science regarding northern goshawks habitat preferences, including foraging area needs. While Alternative G remains the preferred alternative, the standards and guidelines will be amended to ensure consistency with new information that may become available. We have rated the preferred alternative, as Lack of Objections (LO). Please see the enclosed Rating Factors for a description of EPA's rating system.

EPA-1

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We appreciate the opportunity to review this DEIS. When the final EIS (FEIS) is released for public review, please send two copies to the address above (mail code: CMD-2). If you have any questions, please contact me or Summer Allen, the lead reviewer for this project. Summer can be reached at 415-972-3847 or allen.summer@epa.gov.

Sincerely,



Lisa B. Hanf, Manager
Federal Activities Office
Cross Media Division

Main ID# 004463

Enclosures:
Summary of EPA Rating Definitions

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

EPA-1

The Agency agrees with the Environmental Protection Agency's rating in that the supplement to the Final Environmental Impact Statement ensures that the standards and guidelines remain consistent with new information as it becomes available.

Polly Lovato/R3/USDAFS
11/02/2004 11:51 AM

To Peter T Gaulke/R3/USDAFS@FSNOTES
cc
bcc
Subject Fw: [Hellbenders] Documents Reveal Timber Industry Influence

Looks like this was also sent to the comments-southwester-regional-office@fs.fed.us inbox. But here it is just in case it was never received



----- Forwarded by Polly Lovato/R3/USDAFS on 11/02/2004 11:50 AM -----



Bk1492@aol.com
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To: r3_webmaster@fs.fed.us,
comments-southwester-regional-office@fs.fed.us
cc: rodney.frelinghuysen@mail.house.gov
Subject: Fwd: [Hellbenders] Documents Reveal Timber Industry Influence

public comment on draft supplement to the final environmental impact statement for amendment of forest plans for arizona and new mexico

i note a letter dated 9/21/04 sent to me file no 1950-3 with a book about 300 pages long with a forest plan. I have read through it and have many comments for the record on these plans, including the comment forwarded below on the influence of rich lumber barons on the destruction planned for the nation's forests, which is deplorable.

I note that all this forest seems to be subject to being cut down for lumber company profits. the goshawks will all die. when will greed die? I note Bush taking down old growth snags, which hurts birds who dwell in cavities who eat insects. I note that the national park service too has published an extensive document by scientists who claim the bush administration has no regard for environmental protection. Have you seen that document by an esteemed scientist?

I favor a 300 year rotation age for lumber management. 300 years.

SA-1

comment on page 22 - i do not believe the statement that "enough is known of the 14 prey species biology to define and manage for their habitats." I do not believe that for one minute. Self proclaimed biologists have been making far too many mistakes since they have assumed charge since not only biology is involved in bird/animal life. things like global warming, acid rain, chemically altered air water and soil, excess carbon dioxide, fragmented habitat all alter these alleged self proclaimed expert claims of "managing".

SA-2

comment on page 33 - i also note that "none of the scientific information directly answers the question of how much old forest is needed in goshawk foraging". To me that says we should be leaving these forests alone. Cutting them down is an insult to the NATIONAL POPULATION.

SA-3

I THINK ALL STUDIES FROM BEFORE 1990 ARE EXTREMELY OUTDATED AND SHOULD BE THROWN IN THE TRASHCAN. THE WORLD IS NOT WHAT IT WAS IN 1990. IT IS BEING

SA-4

SA-4

DESTROYED EVERY SINGLE DAY BY PROFITEERS SO EVERY DAY LESS IS LEFT.

IT IS VERY IMPORTANT THAT WE LEAVE THESE FORESTS ALONE. I STAND SQUARELY ON THAT PLATFORM AND AGAINST BUSH AND HIS CRONIES INTENT TO DESTROY THESE FORESTS. I ALSO THINK USDA IS EXTREMELY FOCUSED ON PROFITS AND SHOULD NOT BE IN CHARGE OF NATIONAL FORESTS. USDA IS A VERY VERY POORLY RUN AGENCY.

I WANT TO PROTECT EVERY SINGLE BIRD, ANIMAL OR TREE, BUSH THAT IS PRESENTLY IN THAT FOREST. ANY OTHER PROGRAM IS ANATHEMA.

B. SACHAU
15 ELM ST
FLORHAM PARK NJ 07932

THIS IS MY COMMENT FOR THE PUBLIC RECORD.

----- Message from James Kleissler <jkleissler@allegghenydefense.org> on Thu, 28 Oct 2004 14:25:49 -0400 -----

To: Hellbenders Listserv <hellbenders@allegghenydefense.org>

Subject: [Hellbenders] Documents Reveal Timber Industry Influence

http://www.allegghenydefense.org/press/release_041028.shtml

October 29, 2004

For Immediate Release

Jim Kleissler/Ryan Talbott, Allegheny Defense Project (814) 223-4996
Tammy Belinsky, Wildlaw, (540) 929-4222

Documents Reveal Timber Industry, Congressman Peterson Dictating
Management in Allegheny National Forest
Freedom of Information Act Records Reveal Plan to Illegally "Subdivide"
Logging Projects

CLARION, PA - Conservationists today released records that support previous allegations that the Bush Administration had "subdivided" logging projects in the Allegheny National Forest in order to avoid environmental review. The new records, which include e-mails, faxes, memorandums, and project maps, also reveal for the first time the access the timber industry had to Administration officials responsible for management decisions.

"Instead of scientists, the timber industry is dictating how the Allegheny National Forest is going to be managed," explained Ryan Talbott, Forest Watch Coordinator with the Allegheny Defense Project. "Conservationists were kept completely in the dark about these logging proposals while the timber industry had unfettered access to all levels of the Bush Administration."

Conservationists have charged that the logging projects being implemented under the Bush Administration's "Healthy Forests Initiative" are illegal and contrary to good forest management. Conservationists contend that the nation's environmental laws require that the 4,600-acre logging project undergo scientific environmental analysis and involve meaningful public participation. The 4,600-acre tree cutting project was proposed after a windstorm hit the Allegheny National Forest last summer. Controversy erupted over the logging

project when a top Bush Official highlighted the logging as part of its Earth Day promotions. The conservation group Allegheny Defense Project filed a lawsuit against the projects on September 23.

Conservationists allege that the 4,600-acre "salvage" logging project had been broken up into smaller projects to evade legally mandated environmental review and public comment processes. Instead of including the 4,600-acre project into a single environmental impact statement as they have done in the past the Forest Service has decided to implement this logging effort as parts of 25 separate projects. Most of these projects will not undergo environmental assessments and in many cases logging has already been initiated.

The Administration had previously denied allegations that the projects were carved up. However, a newly released memo dated February 12, 2004, states that "Project areas will be evaluated now to determine potential for being subdivided in smaller proposals that could be addressed in a CE." The same February 12 memo recommends 1,800 acres of logging be approved without environmental assessments even though a previous version of the same memo dated February 5 had proposed only 50 acres of logging be approved without environmental analysis.

"The Bush Administration has made a mockery of the national forest system by handing over public lands management decisions to private timber companies," explained Ron Cook, a landscaper from Jamestown, New York.

The new documents also appear to contradict earlier claims from Congressman Peterson that "...these decisions are made by professional scientists and land managers at the Forest Service and not by the timber industry." Conservationists contend the documents demonstrate that these projects were the direct result of pressures from the timber industry. In a February 9 e-mail, Allegheny National Forest Supervisor noted that, "progress on salvage efforts of the July storm salvage his had considerable media play along with attention from Congressman Peterson's office, the under Secretary's office (Mark Rey), and local timber industry. ... We will be working on those EA's this year, but the volume is not likely to actually be offered for sale until the first part of 2005. Hence, industry's frustration which has been conveyed to the Congressman and the Under Secretary." Three weeks later the environmental analyses planned for 1,800 acres were dropped.

"The proposal to log the Allegheny National Forest for special timber interests is outrageous," proclaimed Tim Reim, a volunteer with the Allegheny Defense Project and school teacher in Erie, PA. "Now we know what we got when George Bush appointed a timber industry lobbyist as the Undersecretary of Agriculture."

"These new documents released by the US Fish and Wildlife Service demonstrate that hundreds of documents relating to this controversial logging project were previously withheld without explanation or acknowledgement," explained Ryan Talbott, Forest Watch Coordinator for the Allegheny Defense Project. "Now we know that the administration was trying to hide the fact that the timber industry is dictating national forest policies."

Conservationists pointed out that the documents released provide additional important information. Documents suggest that efforts to expedite logging in the Allegheny National Forest may have interfered with conservation work conducted by the US Fish and Wildlife Service on

...half of the endangered bog turtle in southeastern Pennsylvania.

See documents at
http://www.alleghenydefense.org/press/release_041028.shtml
##

James Kleissler, Forest Watch Director
Allegheny Defense Project
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Clarion, PA 16214
814-223-4996
814-223-4997 fax
jkleissler@alleghenydefense.org
<http://www.alleghenydefense.org>

Allegheny Wild!
<http://www.alleghenywild.org/>
A Citizen's Vision for the Allegheny National Forest

The Hellbender Chronicles
<http://www.alleghenydefense.org/chronicles/>
Defending the Allegheny National Forest

Hellbenders mailing list
Hellbenders@lists.alleghenydefense.org
<http://lists.alleghenydefense.org/listinfo.cgi/hellbenders-alleghenydefense.org>
g

SA-1

A 300-year rotation will certainly allow for those tree species that live that long to approach biological maturity. Average ages for ponderosa pine in the Southwest place the species in the 250-300 year range. Average age can be considerably less than the oldest age, which for ponderosa pine has been as long as 500-600 years. Beyond 250-300 years, most ponderosa pine trees in the Southwest begin to lose physiological vigor and become increasingly susceptible to lightning, diseases, and other damage (Pearson 1950).

The term “rotation age” technically applies to even-aged management. It is the time between harvest treatments designed to promote stand-wide regeneration. Under uneven-aged management, a small amount of regeneration is desired following each harvest entry. The time between harvest entries under uneven-aged management is referred to as the “cutting cycle.”

A term that can be used to describe the fact that management should allow for and promote trees to reach 300 years might be “target age.” Because of the relation between tree size and tree age, the term “target size” can also be used, but the “target size” established must be based on some average growth rate over a finite period of time—in this case approximately 300 years.

SA-2

In development of Alternative G, a tremendous body of literature has been compiled, reviewed and assessed on the prey species associated with the northern goshawk. Many of the 450 northern goshawk related materials that include peer-reviewed scientific papers, published journal articles, masters’ theses, unpublished non-peer reviewed scientific papers, correspondence, and alternative views and scientific perspectives involved in the development of the MRNG (Reynolds et al. 1992), the original “Environmental Impact Statement for Amendment of Forest Plans” and this “Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans” address prey species and their habitats.

SA-3

The “Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico” is being prepared to display, discuss, and disclose scientific arguments and information which is in opposition to the findings in the original EIS which are based on the Reynolds et al., 1992, GTR-RM-217, “Management Recommendations for the Northern Goshawk in the Southwestern United States.” The harvesting of old growth per se is not included in our assessment.

SA-4

Science, research, and biology specifically are evolving with time. Each new piece of science is based and built upon the literature which came before it. Understanding the historic and existing conditions documented in the scientific literature is essential to the development and documentation of new science. In this light, the MRNG (Reynolds et al. 1992), the original “Environmental Impact Statement for Amendment of Forest Plans,” and this “Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans” are based on a lineage of science up to the literature published in the current year.



"Helen Snyder"
<noelsnyder@vtc.net>
11/15/2004 04:26 PM

To: <comments-southwestern-regional-office@fs.fed.us>
cc:
Subject: FEIS comments/Helen Snyder

Harv Forsgren
Southwestern Regional Forester
Attn: Goshawk SEIS Team
333 Broadway Blvd., S.E.
Albuquerque NM 87102

Nov. 14, 2004

Dear Mr. Forsgren,

I have reviewed the draft supplement to the FEIS for Amendment of Forest Plans. My research experience is with the purported 'Apache' race of the Northern Goshawks (NOGO) on the Coronado National Forest (CNF). I base my comments on my 10+ years of work on this bird on the CNF.

I agree with the conclusion that NOGO are not dependent on large undisturbed tracts of mature forest based on the following:

- On the CNF I was able to locate 25-30 active nest areas in most years, and of these there are four recently-active nest areas on old mining townsites, areas that 80-100 years ago were active human settlements.
- Many NOGO nest areas on the CNF are in stringers of trees no more than 35 meters across, surrounded by habitat consisting of grasslands, waist-high manzanita with occasional pinons and junipers – hardly "closed-canopy" forest.
- NOGO use Madrean Oak Woodland for nesting and foraging, a habitat type neither defined as old-growth or closed-canopy, nor is it considered in current management recommendations.
- Much of the diet of NOGO on the CNF consists of doves, pigeons and quail, birds that are hardly old-growth dependent.

SN-1

In the ten years since my report (Snyder, 1994) several important changes have occurred on the CNF that have had and will have a negative impact on the NOGO population here:

- Several stand-replacing fires (Bullock, Rattlesnake, Aspen) have burned through a dozen or more recently-active NOGO territories. It is unknown whether the nest areas remain and whether NOGO continue to use them.
- Developments on private land adjacent to CNF lands at the mouths of canyons have resulted in increased risk to nesting and wintering local NOGO that hunt around bird feeders. Two instances of window-strikes by hunting NOGO have occurred here where I

SN-2

- live.
- The explosion of illegal-alien and drug-smuggling traffic has created new, well-used north-south foot trails through previously isolated nesting areas in all the mountain ranges between the Mexican border and I-10. Several of these trails go within yards of previously undisturbed NOGO nest trees.
- Oak fuelwood cutting has severely altered some groves of mature oaks used by nesting NOGO. It is my understanding that cutting of live fuelwood has stopped, but there could be pressure to resume it under current energy conditions.

SN-2

While the draft supplement seems to have addressed most of the concerns about NOGO on other forests, NOGO diet (95% birds, very different from the North Kaibab) and nesting habitat use (fragmented patches of large trees; nest areas often less than 10 acres) on the CNF is sufficiently different from that in other forest that I agree with the recommendation by the Northern Goshawk Scientific Committee that “[t]he different forest types and suite of prey (suggested by the Mearns’s Quail) on the Coronado National Forest argue for developing a unique set of management recommendations for that forest using the MRNG as a template.”

SN-3

In conclusion, I support Alternative G as far as it goes but would also like to see you add to the supplement to the FEIS the recommendation that the Coronado National Forest develop its own Northern Goshawk Management Guidelines.

Thanks for allowing me to comment on this,

Sincerely,

Helen Snyder
PO Box 16426
Portal AZ 85632
520-558-2413

SN-1

The Agency acknowledges this comment. We have implemented the MRNG for over a decade now and our research shows that trends in territory occupancy are stable.

SN-2

The “Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico” was prepared to display, discuss and disclose scientific arguments and information which are in opposition to the findings in the original EIS which are based on the MRNG (Reynolds et al. 1992). Activities on private lands and border crossing issues are outside the scope of our assessment.

From 1985 to 2002, wildfires burned a total of approximately 1,678,000 acres in the Southwestern Region. These acres include all vegetation types such as alpine tundra, subalpine forest, mixed conifer forest, ponderosa pine forest, several woodland types, and mountain and desert grasslands. Of the approximately 1.7 million acres burned, 6 percent burned at high intensity. Implementing the MRNG (Reynolds et al. 1992) at the landscape level helps to lessen the effect of wildfire by widening the canopy in foraging areas and protecting nesting territories.

SN-3

There are some differences in northern goshawk habitat on the Coronado National Forest from the rest of the USDA Forest Service’s Southwestern Region. However, the current MRNG are comprehensive enough to provide guidance for management of northern goshawk habitat on the Coronado National Forest. For example, nesting in small fragmented stands would still require the establishment of a post family fledgling area and require that any management benefit the northern goshawk.

11/11/2004 11:46 5206437268

KAIBAB PAIUTE

PAGE 02/02

Kaibab Band of Paiute Indians



November 11, 2004

Harv Forsgren
Southwestern Regional Forester
Attn: Goshawk SEIS Team
USDA Forest Service
333 Broadway Blvd., SE
Albuquerque, NM 87102

Dear Mr. Forsgren;

Thank you for your notification regarding the opportunity to comment on the Draft Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans in Arizona and New Mexico. We appreciate your recognition of our tribe's sovereign status. The Kaibab Band of Paiute Indians consider issues relating to the forests of northern Arizona to have special significance as they are ancestral homelands.

Clearly, the management of these forests by your agency has been unsatisfactory in providing suitable conditions for the full complement of flora and fauna that were functioning as a system when delegated to your care roughly a hundred years ago. Cattle grazing, road building and industrial logging in these areas are not stresses which the system evolved to handle, nor did tribes employ them in pre-Columbian times. Today's mitigation measures are undertaken merely as lip service to species conservation, often failing to promote their recovery. Make no mistake: species extinction, whether local or *in toto*, is a grievous assault on our tribal culture.

We support scientific feasibility studies and alternatives for managing the forests in a manner that truly emulates their condition prior to western colonization. We are confident that this, alone, will resolve threats to the existence of these species.

KBP-1

Regards

LeAnn Skrzyński
Environmental Program Director

Tribal Affairs

HC 65 Box 2
Pipe Spring, Arizona 86022

Phone (928) 643-7245
Fax (928) 643-7260

KBP-1

The Agency is confident that it has done a thorough and extensive review of the available science related to presettlement conditions, the northern goshawk species, and its habitat needs and habitat characteristics. The Agency has reviewed over 450 northern goshawk related materials that include peer-reviewed scientific papers, published journal articles, masters' theses, unpublished non-peer reviewed scientific papers, correspondence, and alternative views and scientific perspectives.

REC'D USDA
REGIONAL FORESTER'S OFFICE
SOUTHWESTERN REGION

OCT 06 2004



Mr. Harold C. Reynolds
181 College Ave.
Alamogordo, CA 92010



R.F. Forsgren:

Many thanks for sending me
a copy of the Draft Supp.
to the Final EIS for Amend.
of Forest Plans.

Since I am not an expert
about either the Spotted
Owl or the Goshawk, and
since I am not familiar
with problems on other
Forests, I will confine my
remarks to the Lincoln N.F.,
and more particularly to the
Sacramento R.D.

The First Priority on the
Sac. R.D. is to Thin the
Forest and Reduce the
Hazards of Fire, Insects
and Disease, As Soon

(2)

As Possible!

We have been suffering a Drought here for about 15 years.

We have already lost thousands of acres of Forest to Fire and Insects.

Also, we have lost Owl Habitat and Owls. Probably, we have lost Goshawk habitat and Goshawks.

Therefore, the Thinning Process, both Commercial and Pre-Commercial, Must Proceed as Fast as Possible!

This will take People and Money!

③

Therefore, You Must do all
that you can to Secure the
Needed Funds!

Constraints on the Thinning
Process to "Protect the Goshawk
Habitat" Must Not Slow the
Thinning Process!

If they do, we will Lose
Goshawk Habitat and Goshawks
to Fire, Insects and Disease!

HCR-1

The Bottom Line Here is:

Thin It or Lose It!

Help the Good Folks on the
Lincoln N.F.!

OVER! Harold Reynolds, BSF
Forester Emeritus
Sierra Club Member

P.S.

So far, the Lincoln People
have done an Excellent
Job of Thinning and
Hazard Reduction!

HCR

HCR-1

There is a fine line between protecting and damaging wildlife habitat. It is important and necessary to define what wildlife species and associated habitat are under discussion before one can determine whether management actions are protecting or damaging wildlife habitat. The generic term “wildlife habitat” fails to recognize that different wildlife species can have tremendously different habitat needs. The use of “indicator species” to represent specific habitat conditions is an approach used by the Forest Service that helps further define and categorize various wildlife habitats and whether proposed actions will help or damage key wildlife habitat components.

Increased occurrence of stand-replacing fire and insect epidemics in overly dense stands during times of drought appear to be the major environmental threats to those Southwestern forests that historically experienced frequent, low-intensity burns. Those species unable to utilize habitat following a stand-replacement fire are negatively impacted as the frequency and number of acres burned in this fashion increase. Current management philosophy recognizes that both mechanical thinning and the reintroduction of fire into fire-dependent ecosystems is key to the restoration of forests throughout the Southwest.

As one example of the Agency’s continuing management, the North Kaibab Ranger District has been implementing the MRNG for 8 years, harvesting an average of 4,372 MBF per year over an average of 2,380 acres per year under the management guidelines. During this time, territory occupancy has remained stable (Reynolds and Joy, 1998). The Agency is also thinning an average of less than 100 acres per year of wildland-urban interface on the district.

GOVERNOR
Bill Richardson



STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way
PO Box 25112
Santa Fe, NM 87504

STATE GAME COMMISSION
Guy Riordan, Chairman
Albuquerque, NM

Alfredo Montoya, Vice-Chairman
Alcalde, NM

David Henderson
Santa Fe, NM

Jennifer Atchley Montoya
Las Cruces, NM

Peter Pino
Zia Pueblo, NM

Dr. Tom Arvas
Albuquerque, NM

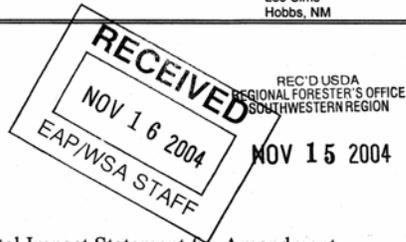
Leo Sims
Hobbs, NM

DIRECTOR AND SECRETARY
TO THE COMMISSION
Bruce C. Thompson

Visit our website at www.wildlife.state.nm.us
For basic information or to order free publications: 1-800-862-9310.

November 12, 2004

Harv Forsgren
Southwestern Regional Forester
Attn: Goshawk SEIS Team
333 Broadway Blvd., SE
Albuquerque, NM 87102



Re: Draft Supplement to the Final Environmental Impact Statement for Amendment
of Forest Plans NMGF Doc. No. 9638

Dear Forester Forsgren:

The Department of Game and Fish (Department) has reviewed the Draft Supplement to the Final Environmental Impact Statement (FEIS) for Amendment of Forest Plans (Supplement). The Supplement updates the FEIS, which amended the 11 Forest Plans in Region 3 for the Northern Goshawk, Mexican Spotted Owl, and old growth standards and guidelines in June 1996. The Supplement to the FEIS addresses an opinion filed November 18, 2003, by the Ninth Circuit Court of Appeals, which held that the FEIS failed to disclose responsible scientific opposition that was a part of the project record.

The Department acknowledges the selection and future implementation of Alternative G, which according to the Supplement, represents an ecosystem management approach. Page 9 states: "The approach used for managing goshawk habitat areas provides for many wildlife species, timber and forage. As a result, the standards and guidelines for ecosystem management in goshawk habitat areas are not focused on any single species or element."

Both the Department and the Arizona Game and Fish Department initially supported implementation of Alternative D, which required that the same percentage of old growth (VSS 6, 24"+dbh) and mature forest (VSS 5) be protected or created as Alternative G proposes, but with the objective of preserving these quantities of old growth and mature forest in large blocks across the landscape. Alternative G proposes to maintain these levels in smaller groups across the landscape. These two alternatives also differ in that Alternative D proposed 1) canopy closure restrictions not just at the smaller group/patch scales, as Alternative G does, but also at the site and larger scales; 2) retaining guidelines for hiding and thermal cover allocations for goshawk prey and other wildlife; and 3) allowing up to 20 percent of the landscape for even-aged management for sites up to 100 acres in size. Alternative G, however, will implement uneven-aged management and therefore will create a more complex forest structure at varying scales

Mr. Harv Forsgren

2

November 12, 2004

across the landscape than created by even-aged management. As stated in Table 4, Alternative G calls for no hiding and thermal cover allocations, as it was not needed with the change from even-aged to uneven-aged management. Both Alternatives D and G call for the same target tree age of 250+ years for areas designated as post-fledging family areas.

The Department recognizes the inherent complexity of understanding required for managing forests to create or maintain a mosaic of habitat types, ages and structures at a landscape scale for conservation of a diverse wildlife fauna. We also recognize that uncertainty and disagreement still exist with regard to research findings on habitat needs for Northern Goshawks at multiple scales across the forest landscape. However, we do believe that ultimately, the move from even-aged forest management to uneven-aged management is a major step in the right direction and will better replicate the habitat conditions under which southwestern forest fauna evolved.

NMD
GF-1

We advise, however, that new initiatives and laws such as the Healthy Forest Initiative and the Healthy Forest Restoration Act should not trump or be allowed to substantially modify this management scenario that is designed to protect old-growth dependent species such as the Mexican Spotted Owl and Northern Goshawk, except in immediate and localized wildland/urban interface situations designed to protect human life and property.

NMD
GF-2

We appreciate the opportunity to comment on this project. Should you have any questions regarding our comments, please contact Mark Watson, Habitat Specialist, of my staff at 476-8115, or <mwatson@state.nm.us>.

Sincerely,



Lisa Kirkpatrick, Chief
Conservation Services Division

LK/MLW

CC: Susan MacMullin (Ecological Services Field Supervisor, USFWS)
Tod Stevenson (Deputy Director, NMGF)
Luke Shelby (Assistant Director, NMGF)
Area Operations Chiefs (NMGF)
Area Operations Habitat Specialists (NMGF)
Sandy Williams (Non-game Ornithologist, NMGF)
Mark Watson (Conservation Services Habitat Specialist, NMGF)

NMDGF-1

The 1996 amendment emphasizes the use of the uneven-aged silviculture system. However, the use of the even-aged silvicultural system is not entirely excluded. Any use of even-aged treatments must be justified and documented during the analysis process.

Optimum landscape diversity will not result from any single silvicultural system. Even-aged management emphasizes between-stand diversity. Uneven-aged management emphasizes within-stand diversity. Optimum landscape diversity will result from a mix of the two silvicultural systems.

Several major shifts in silviculture treatments in the Southwest have occurred since forest plans in the Southwest were amended and since the National Fire Plan was developed. The first adjustment has been a shift from even-aged management to uneven-aged management. Uneven-aged management features multistoried stand structures over single or two-storied stand structures and features within-stand diversity rather than between-stand diversity.

Both even-aged and uneven-aged silvicultural systems include regeneration treatments (regeneration cuts) in order to control age-class distributions, but the two systems vary as to when regeneration is established and how much regeneration is established. Both spatial and temporal variations in regeneration cuts result in the differing stand structures. Under the uneven-aged management system, continuous forest cover is favored, though stand density may be somewhat open to encourage shade-intolerant tree regeneration such as ponderosa pine. Under the even-aged management system, stand density can often be retained in a more dense condition, but at some point, even-aged stands must be substantially reduced in density to encourage shade-intolerant regeneration.

The second major shift that has occurred has been a shift from regeneration treatments (under both even-aged and uneven-aged management) to non-regeneration treatments—thinning. A thinning is not considered a regeneration treatment, and as such, does not fall under either the even-aged or uneven-aged silvicultural systems. The primary objective of thinning is species and stocking control to achieve management objectives. Thinning treatments (regeneration is not the objective) can occur under both silvicultural systems, therefore, thinning itself does not indicate a particular silvicultural management system. Thinning-from-below taken to its purist form, however, can produce stand structures that more closely resemble even-aged stand structures than multistoried stand structures.

With an increased emphasis on fuels reduction since the creation of the National Fire Plan (2000) and the Healthy Forest Restoration Act (2003) and emphasis on treating wildland-urban interface (WUI), many of the fuels reduction treatments fall under the category of thinning. Treatments that encourage regeneration tend to increase “ladder fuels” when tree seedlings becomes established and grow into saplings and pole-size understories. Although a failure to provide for an adequate amount of regeneration is counter productive in maintaining a balance of VSS stages in the long term, short-term emphasis for now appears to be on thinning with less emphasis on regeneration treatments.

Most of the present day thinning performed in the Southwest retains the larger, older trees and removes the smaller, younger trees. This form of thinning is often referred to as thinning-from-below. This form of thinning does not require that a diameter cap be applied for the prescription

to be effective, provided a description of what is to be retained is included in the detailed prescription. Thinning-from-below applied in its purist form can result in post-treatment stand structures that are more even-aged. Current emphasis by the region is to promote free thinning. This form of thinning still allows for the retention of the largest trees in the stand, however, more flexibility is allowed in the size of trees removed to better achieve multistoried stand structures and fuels objectives. Current forest plan direction emphasizes multistoried stand structures, not single-storied stand structures.

Reviews of recent fuels projects within the Region by the Forestry and Forest Health Group (FFH), where diameter limits have been applied (9", 12", or 16"), found that treatments often result in even-aged stand structures because of the complete removal of size classes below the established diameter limit. The heavy removal of the smaller size classes is often done to accomplish as much fuels reduction (ladder fuels) in the understory as possible, because canopy fuel loading is often left untouched due to the imposed diameter limits. Treatments that only reduce surface and ladder fuels may reduce stand-replacement fires from initiating onsite, but without adequate canopy fuel reduction, little can be done to reduce the threat of crown fire entering an area from offsite.

NMDGF-2

Project planning on vegetation management projects, including those authorized under the Healthy Forests Initiative which includes the Healthy Forest Restoration Act, must adhere to the standards and guidelines included in the 1996 "Amendment of Forest Plans in Arizona and New Mexico." Any deviation to these standards and guidelines by an individual project will be handled through the site-specific National Environmental Policy Act analysis and disclosure requirements.



United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
P.O. Box 26567 (MC-9)
Albuquerque, New Mexico 87125-6567



November 10, 2004

9043.1
ER 04/744

Harv Forsgren, Regional Forester
c/o Goshawk Supplement Team
333 Broadway SE
Albuquerque, NM 87102

Dear Mr. Forsgren:

The U.S. Department of the Interior has reviewed the Draft Supplement to the Final Environmental Impact Statement for the Amendment of Forest Plans, Arizona and New Mexico. In this regard we have NO COMMENT.

Thank you for the opportunity to review this document.

Sincerely,

Stephen R. Spencer
Regional Environmental Officer

Appendices

The following appendices remain intact and unedited from the original “Final Environmental Impact Statement for Amendment of Forest Plans.” The contents of these appendices are provided on the CD-ROM which accompanies this supplement to the final environmental impact statement. Contents of these appendices are also available on the World Wide Web at <http://www.fs.fed.us/r3/projects/index.shtml>.

Appendix A – Process Record

Appendix B – Forest Plan Amendments

Appendix C – Forest Plan Correction Notices

Appendix D – Standard Vegetation Treatment Table

Appendix E – Alternative Comparison – Standards/Guidelines

Appendix F – Copies of DEIS Comment Letters

Appendix G – Regional Habitat Differences

The appendices that follow are those associated with the preparation of this supplement to the final environmental impact statement and also can be found on the CD-ROM which accompanies this supplement to the final environmental impact statement and on the World Wide Web at <http://www.fs.fed.us/r3/projects/index.shtml>.

Appendix H

Review of supplemental information relevant to habitat management for the northern goshawk in the southwestern United States. Reynolds, R. T., D. A. Boyce, R. T. Graham, M. Hildegard Reiser. 2001.

Appendix I

Is the northern goshawk an old-growth forest specialist or a habitat generalist? Reynolds, R. T. 2004.

Appendix J

Northern goshawk and forest management in the Southwestern United States. The Wildlife Society, Technical Review 96-2. Braun, et al. 1996.

Appendix K

50 CFR 17, Endangered and Threatened Wildlife and Plants; Notice of 12-Month Finding on a Petition to list the Northern Goshawk in the Contiguous United States West of the 100th Meridian. Federal Register, Vol. 63, 35183. U.S. Fish and Wildlife Service. 1998.

Appendix L

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