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In Reply Refer to:
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02-21-96-F-0295

December 27, 2004

Memorandum

To: Director, Navajo Regional Office, Bureau of Indian Affairs, Gallup, New Mexico

From: Field Supervisor

Subject: Biological Opinion on the Navajo Nation Ten-Year Forest Management Plan

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (ESA). This biological opinion is provided in response to your June 4, 2003, request to initiate formal consultation and your November 24, 2004, request to finalize the consultation. At issue are impacts that may result from the proposed Navajo Nation Ten-Year Forest Management Plan (FMP) Alternative Four, located in Apache County, Arizona, and San Juan and McKinley counties, New Mexico. The proposed action may affect the Mexican spotted owl (*Strix occidentalis lucida*) (MSO). No critical habitat for the MSO has been designated on the Navajo Nation, therefore none will be affected by this action.

Informal consultation was previously conducted on this action and concluded on April 15, 2002 (consultation number 02-21-96-I-0295). The Bureau of Indian Affairs (BIA) re-initiated consultation on June 21, 2003, and requested formal consultation at the advice of attorneys in the U.S. Department of Justice and Regional Solicitor's Office (SOL) based on *Silver v. Thomas* No. CIV 94-1610-PHX-RGS (D. Ariz). We provided a draft biological opinion to the BIA on October 28, 2003. On June 14, 2004, we received BIA's response that, based on legal concerns identified by the SOL, revisions were made to the April 14, 2000, environmental impact statement (EIS). Your letter stated that those revisions were not substantive and did not change or modify the proposed action. On September 24, 2004, the Notice of Availability for the draft Supplemental Programmatic EIS (SPEIS) was published in the Federal Register and a copy was sent to us. You did not make changes to the draft SPEIS as a result of public comments that would affect the consultation (J. Martin, BIA, pers. comm.)

On November 24, 2004, the BIA requested that we finalize the biological opinion and provided us with a summary of changes made to the 2000 EIS. You made editorial changes to the EIS to address concerns identified by the SOL regarding statements about lack of data for specific resources (e.g., grazing, homesites and recreation) and to emphasize that the EIS is a programmatic analysis intended to guide future site-specific proposals within the broader scope of the FMP. No changes were made to measures that address effects on threatened and

endangered species or to the five alternatives. Alternative Four is still the BIA's preferred alternative.

Our opinion is based on information from the FMP and its related biological assessment (BA), SPEIS, executive summary to the informal consultation, your formal consultation request, letters, telephone conversations, and other information sources. Literature cited in this biological opinion is not a complete bibliography of all literature available on the MSO, forest management and its effects, or on other subjects considered in the opinion. A complete administrative record of this consultation is on file at this office.

In your June 4, 2003, request for formal consultation you also requested our concurrence on your determination that the FMP may affect, but is not likely to adversely affect, the southwestern willow flycatcher (*Empidonax traillii extimus*), bald eagle (*Haliaeetus leucocephalus*), and rhizome fleabane (*Erigeron rhizomatus*). We concurred with your determination in our April 15, 2002, memorandum, which also includes our rationale.

Consultation History

The consultation history is summarized in Table 1.

Table 1. Summary of Consultation History

Date	Event
08/06/99	We received BIA's request for consultation on the FMP, but did not initiate consultation because an alternative had not been selected.
07/26/00	We received responses to our 12/08/99 list of questions submitted to BIA regarding the FMP and MSO.
09/12/01	We received BIA's request to proceed with consultation based on the selection of Alternative Four by the Navajo Nation.
12/11/01 12/12/01	We received the final draft (undated) of the FMP with appendices, and the Final Programmatic EIS for the FMP (2000) with appendices from the BIA.
01/15/02 to 04/02/02	We met and corresponded several times with the Navajo Nation and BIA to discuss questions regarding the FMP, MSO information, grazing activities and other forest activities, and to review drafts of the concurrence memo.
04/15/02	We concluded informal consultation with a concurrence memo.

05/28/02	We received the Executive Summary to the section 7 consultation, which details the changes made to the FMP, from BIA.
06/21/03	We received BIA's 06/04/03 request for formal consultation, which stated that there have been no significant changes to the scope of the FMP and they are relying on the prior BA, EIS, and related information for this consultation.
07/22/03	We initiated formal consultation by sending a 30-day letter to the BIA, and requested updates to any relevant information. We received responses via telephone and fax on September 12 and October 9, 2003, respectively.
10/28/03	We sent the final draft of our biological opinion to BIA for review and comment.
06/14/04	We received BIA's 06/07/04 explanation of revisions to the FMP EIS and plans for public review.
09/29/04	We received the draft Supplemental Programmatic EIS for the FMP.
11/24/04	We received BIA's 11/24/04 request via fax to finalize the biological opinion along with a list of changes made to the 2000 EIS.
12/xx/04	We sent BIA the final biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Background

Under the National Indian Forest Resources Management Act (P. L. 101-630) (NIFRMA), the BIA is responsible for timber management on Indian lands, either directly or through contracts with Tribes under the Indian Self-Determination Act (Public Law 93-638, as amended). Under this arrangement, the Navajo Nation Forestry Department (NNFD) contracts a number of forest management activities. The BIA's role is to manage, fund, and oversee these activities. This role triggers compliance with the National Environmental Policy Act and section 7 of the ESA. In keeping with FWS trust responsibilities, the Navajo Nation is considered and treated as a license or permit applicant entitled to full participation in the consultation process.

The FMP's regulatory jurisdiction is defined by BIA Manual 53, supplement 2 and implementing regulations (25 Code of Federal Regulations (CFR) 163), and the NIFRMA. Jurisdiction includes timber harvest, timber stand improvement (planting, thinning), forest protection (disease and insect control, enforcement against trespass, fire prevention), permitting for Navajo personal use (firewood, fenceposts, poles), and access development as required for the aforementioned activities.

This consultation evaluates only activities covered under the FMP's regulatory jurisdiction. Grazing and range management activities, fire management, and general recreation are not part of the proposed action, were not addressed in the FMP, and therefore are not covered in this consultation.

The BIA is authorized to regulate grazing of livestock on the Navajo Nation (25 CFR 167). Subject to Federal regulations, responsibility for range management, enforcement, and the development of management plans rests with the Navajo Nation Department of Agriculture in coordination with the BIA, Branch of Natural Resources. Once site-specific range management plans are developed for areas within the Navajo Forest, the Navajo Nation will coordinate with BIA to determine whether initiation of section 7 consultation on grazing impacts to listed species is appropriate.

The BIA is currently developing a programmatic wildland fire management plan for the Navajo Nation and National Park Service lands within the Navajo Nation, and has been consulting informally with the FWS on that plan.

One new recreation area and one proposed hiking trail are included in the FMP. However, most recreation management authority lies outside the regulatory responsibilities of the NNFD and the BIA Branch of Forestry. Therefore, discussion of recreation will be limited.

Proposed Action

The FMP's purpose is to establish direction for future management in the Navajo Forest, which covers 596,725 acres and straddles the Arizona/New Mexico state line 30 to 100 miles south of the Utah/Colorado borders. The Navajo Forest includes all commercial timberland on the Navajo Nation. Commercial timberland is classified by the BIA as capable of producing 15 cubic feet of timber/acre/year.

The FMP will be in effect for ten years after approval by the Navajo Nation and BIA, after which it will be subject to revision to reflect changes in conditions. The FMP is based on projections of forest conditions over 200 years. These projections are used to determine those actions to be taken in the next ten years to obtain desired results over the long-term.

The FMP is a strategic plan rather than an operational plan. It applies to a large area, and because environmental data are limited for the Navajo Forest, much of the FMP does not describe specific project areas. Instead, the FMP predicts future conditions and recommends overarching policies that apply to broad classes of land. Implementation of specific projects that conform to plan policies will depend on subsequent site-specific planning and design. The BIA will enter into further section 7 consultation on specific projects implemented under the FMP that may affect listed species or critical habitat in a manner or to an extent not considered in this plan-level consultation.

Alternative 4, the preferred alternative, was approved by the Resources Committee of the Navajo Nation Council (Resources Committee) on July 30, 2001. A complete description of Alternative 4 can be found in the FMP (NNFD 2001) and its associated BA (SWCA1998) and SPEIS (USDI BIA 2004). The following is a summary derived from those documents.

The desired future condition for Alternative 4 is a forest managed toward a mosaic of even- and uneven-aged timber stands interspersed with Special Management Areas (SMAs) and areas that are reserved for non-timber uses. The Commercial Forest, which excludes non-forested and administratively unavailable areas, totals 388,497 acres. Operable timber lands of 74,735 acres for SMAs¹ and 60,137 acres of marginal timber production areas were deducted from the Commercial Forest resulting in a Harvestable Commercial Forest Base of 253,625 acres. Nearly one-fifth of the Navajo Forest, 114,024 acres, will be scheduled for treatment over the ten-year planning period, with 49,439 acres of even-aged, and 64,585 acres of uneven-aged treatment. Total treated acreage in proposed individual timber sales will vary in size from 4,654 acres to 16,393 acres with individual treatments of 100-acre blocks or less. The average annual allowable cut will be 15.9 million board feet per year (MMbf/yr), ranging from 8.8 to 24.8 MMbf/yr (Table 2).

Sale Name	Compartments	Total Acres	Treated Acres	Harvest Rate (bf/acre)	Estimated Harvest (MMbf)	Primary Access Road
Tohnitsa	47, 48, 55	28,886	9,647	1,890	18.2	7180
Oak Ridge	1, 2, 4, 5, 7, 8	64,360	14,495	1,000	14.5	9000, 90600
Sanostee	35, 36, 41, 42	41,562	10,003	1,500	15.0	7540, 7500, 7170
Crystal	51, 52, 53, 58, 59	47,802	11,982	1,500	18.0	8050, 8091, 7130, 8000
Fluted Rock	23,24	29,873	7,082	1,250	8.8	9450, 9400, 9000
Piney Hill	10, 11, 12, 13, 16	40,952	11,313	1,250	14.1	9000
Bear Canyon	9, 14	30,913	12,127	1,250	15.2	9000, 9800
Twin Buttes	54, 56, 60, 61, 62	39,292	4,654	1,250	5.8	8010, 8013, 8091, 8000
Sawmill	15,17, 19	40,304	16,328	1,500	24.5	9200, 9220, 9400, 9430
Berland Lake	46, 49, 63	21,601	16,393	1,500	24.6	7180
Totals	-	385,545	114,024	-	158.7	-

In general, even-aged prescriptions will conform to the two- or three-step shelterwood method and uneven-aged regeneration treatments will conform to single-tree and group selection designed to maximize stand-level diversity and connectivity of reserves (FMP Section B.IV).

¹ A total of 149,647 acres of the Navajo Forest is designated as SMAs. Of this, 74,735 acres are accessible forest lands that may be treated to meet objectives according to the resource emphasized (Tables 3 and 4).

Timber compartment examination data will be used for stand-level assessment, and to determine which silvicultural system (even-aged or uneven-aged) will be used. Within SMAs, treatments will be compatible with the resource condition and management emphasis and will generally emphasize un-even aged management unless otherwise noted (see Tables 3 and 4). In the Ponderosa pine-piñon pine/juniper cover type, 60% of the area will not be treated and 40% will be treated with a two-stage group shelterwood prescription at a 120-year rotation (SWCA 1998).

Section A (Resource Protection) for FMP Alternative 4 describes measures to protect timber against damaging insects, disease, timber trespass, and wildfire. The following is a summary of measures pertinent to this consultation: about 500 acres within the Commercial Forest will be thinned for insect and disease treatment, with the balance of the forest area treated on an as-needed basis; native seed sources will be used for site stabilization/erosion control; records of all forest protection measures will be maintained for three years prior to archiving; all Navajo Forest protection activities by the NNFD and other resources departments and/or organizations will be monitored; and the NNFD will be consulted on all land-use activities on the Navajo Forest.

No new roads will be built under Alternative 4. Approximately 125 miles of roads within the Commercial Forest and SMAs will be closed. Existing roads reopened or improved for logging operations will be maintained according to *Navajo Nation Environmental Protection Agency's Best Management Practices for Protection of Water Quality* (BMPs) (FMP Appendix D). Roads used for timber harvest will be closed following harvest unless they are needed for other management activities. In the NNFD's capacity as consultant on all land-use activities in the Navajo forest, they will discourage new road construction by others, such as customary land-users.

One new recreation area and a 1.5-mile hiking trail will be developed within the SMAs, contingent on funding from timber revenue. The size, location, and user-capacity levels of the site and trail are unknown at this time.

Harvest activities will be scheduled to avoid excessive ground damage, especially during spring thaw and heavy summer precipitation.

AREA	ACRES	CHAPTER	RESOURCE/EMPHASIS
Bear Canyon	4,462	Kinlichee	Water, Wildlife
Black Soil Wash	4,073	Kinlichee	Water, Wildlife
Bowl Canyon	12,586	Mexican Springs	Water, Wildlife
Canyon de Chelly	21,509	Chinle, Nazlini, Sawmill, Tsaile/Wheatfields	Water, Wildlife
Buffalo Pass	10,694	Cove, Lukachukai, Red Valley, Sanostee	Water, Wildlife
Lone Tule Wash	6,636	Kinlichee	Water, Wildlife
Narbona Pass	10,121	Crystal, Mexican Springs, Naschitti, Sheep Springs	Scenic, Water

Natural Bridge Canyon	1,339	Kinlichee, Fort Defiance	Water, Wildlife
Piney Hill Lookout	1,776	Kinlichee, Fort Defiance	Water, Wildlife
Ruin Canyon	3,505	Kinlichee	Water, Wildlife
Sanostee Wash	4,376	Luckachukai, Sanostee	Water, Wildlife
Sanostee Burn	2,002	Sanostee	Wildlife (deer)
Scattered Willow Wash	7,694	Kinlichee	Water, Wildlife
Sonsela Buttes	10,942	Crystal	Cultural Resources, Wildlife
Toadlena	866	Two Grey Hills	Water (fish)
Tsaile Creek	16,809	Luckachukai, Sanostee, Tsaile/Wheatfields	Water, Wildlife
Wheatfields Lake Watershed	16,858	Crystal, Tsaile/Wheatfields	Recreation, Water, Wildlife
Whiskey Creek Valley	13,399	Crystal, Sheep Springs, Tsaile/Wheatfields	Water, Wildlife
TOTAL ACRES	149,647	-	-

Note: The area within SMAs includes other administratively or environmentally restricted land types. The net area subtracted from the Harvestable Commercial Forest Base is 74,735 acres.

Table 4 - General Management Prescriptions Proposed for SMAs in Alternative 4	
AREA	MANAGEMENT PRESCRIPTION
Bear Canyon	100' buffer from Canyon rim, no harvest in Canyon bottom, group selection and patch cuts in piñon pine.
Black Soil Wash	Same as Bear Canyon
Bowl Canyon	No timber harvest on slopes >30%, manage for old-growth forest conditions, group selection outside old-growth areas, regenerate aspen stands, several T&E species present
Canyon de Chelly	Group selection in pine, patch cuts in piñon to enhance deer forage, several T&E species present
Buffalo Pass	Single tree selection along N-13, Group Selection elsewhere, thin Gambel oak stands to promote acorn production and encourage regeneration
Lone Tule Wash	100' buffer from canyon rim, no harvest in canyon bottom, group selection in pine, protect raptor nesting sites, patch cuts in piñon pine
Narbona Pass	Single tree selection along NM 134, group selection elsewhere
Natural Bridge Canyon	Same as Bear Canyon
Piney Hill Lookout	Group selection in ponderosa pine, mark piñon-juniper for fuelwood harvest
Ruin Canyon	Same as Lone Tule Wash
Sanostee Wash	No commercial timber harvest except to enhance deer winter range
Sanostee Burn	Thin Gambel oak stands to promote acorn production and regeneration, maintain shrub and oak habitat; no planting of ponderosa pine, maintain tree cover at perimeter of burn and with oak and shrub habitat
Scattered Willow Wash	Same as Bear Canyon

Sonsela Buttes	Preserve and enhance existing old growth habitat, reintroduce prescribed fire, patch cuts in piñon-juniper to enhance deer winter range
Todalena	200 foot no-cut buffers on all washes
Tsaile Creek	Group selection in the commercial forest, reintroduce prescribed fire, thin overstocked stands to reduce fire hazard, preserve and enhance existing old-growth habitat, T&E species present
Wheatfield Lake Watershed	Same as Tsaile Creek
Whiskey Creek Valley	Uneven-aged management to maintain diversity, fence riparian areas, manage for turkey production, preserve and enhance existing old-growth habitat

The interdisciplinary planning process will be used for preparation of timber sales. To the extent possible, treatments will be subject to guidelines in the *Timber/Wildlife Coordination Handbook* (T/WCH) (FMP Appendix C). The T/WCH was developed by the Navajo Nation Department of Fish and Wildlife (NNDFWL) for use by the NNFD to protect and enhance wildlife habitat when developing silvicultural treatments. The BIA states that there are difficulties in implementing forest management activities exactly as written in the T/WCH (e.g., leaving 150 to 200 square feet/acre basal area where site conditions will not support development of such tree density/sizes). However, species surveys will be conducted as written in the T/WCH. Lakes, streams, and wetlands will be protected per the BMPs. Within buffers around lakes, streams, and wetlands, no Commercial Forest activities will be permitted. Buffers will range from 25 to 200 feet depending on the type of feature, use by listed species, and other variables.

The Navajo Nation Management Plan for the Mexican Spotted Owl (NNDFWL 2000) (MSO Management Plan) will be followed. The MSO Management Plan provides conservation benefit to the MSO and its habitat, and provides assurances that it will be implemented and effective in owl conservation (USDI FWS 2004). The *Recovery Plan for the Mexican Spotted Owl* (USDI FWS 1995) (Recovery Plan) will be followed, where applicable². Below is a consolidated list of conservation measures taken from the BIA's May 21, 2002, executive summary of the prior informal consultation (SPEIS Appendix K2), the FMP, SPEIS, and BA. If a specific action is not covered or is only partially covered by this list, a complete reference may be found in the Recovery Plan and MSO Management Plan. The BIA, in coordination with the NNFD, will:

- (1) Inventory for MSO prior to any potentially disturbing management action according to U.S. Forest Service Region 3 protocol or updated protocol.

² Recovery Plan guidelines for Restricted Areas do not apply to what is identified as "pine-oak" in the FMP. In the Colorado Plateau Recovery Unit (outside the Zuni Mountains and Mount Taylor regions) this forest type does not meet the operational definition for pine-oak forest under the Recovery Plan.

- (2) Establish Protected Activity Centers (PACs) based on survey results and other sources of information.
- (3) Remove PAC acres from commercial timber land projections and planning.
- (4) Avoid timber harvest in PACs except for fuels reduction treatments in accordance with Recovery Plan recommendations.
- (5) Avoid treatments in mixed-conifer or riparian habitat.
- (6) Conduct treatments in other forest and woodland types according to the following guidelines per the Recovery Plan, as appropriate: manage for landscape diversity, mimic natural disturbance patterns, incorporate natural variation in stand conditions, and retain special features such as snags and large trees.
- (7) Avoid trail construction in PACs and mixed-conifer habitat.
- (8) Avoid wood cutting in PACs.
 - (a) Inform wood-cutting permittees of general locations where wood may not be collected.
 - (b) Post the general vicinity of PAC areas, or block and post access roads.
 - (c) Field check PAC areas for trespass woodcutters by Navajo Nation conservation officers.
- (9) Avoid road improvements during the breeding season in PACs unless non-nesting can be inferred.
- (10) Keep heavy equipment or loud machinery more than 0.25 mile from a nest/roost site or PAC boundary (if the nest/roost site is not known) during the breeding season unless non-nesting can be inferred. This distance will be extended up to 0.5 mile for particularly intense sound (e.g., blasting) and/or constantly loud (e.g., chainsaws) sources of noise.
- (11) Avoid removal of trees greater than 9 inches diameter at breast height (dbh) from PACs.
- (12) Avoid tree removal from the 100-acre "core area" centered around the nest site of PACs.

When the Recovery Plan is revised, the BIA and the NNFD will amend the FMP to incorporate new Recovery Plan recommendations, as applicable, by adding an addendum to the FMP.

For management in SMAs, measures in the T/WCH, BMPs, MSO Management Plan and the Recovery Plan are considered minimum standards (SWCA 1998).

STATUS OF THE SPECIES

The MSO was listed as a threatened species in 1993 (USDI FWS 1993) and critical habitat was recently re-designated in 2004 (USDI FWS 2004). The primary threats to the species were cited as even-aged timber harvest and the threat of catastrophic wildfire, although grazing, recreation, and other land uses were also mentioned as possible factors influencing the MSO population. The FWS appointed the Mexican Spotted Owl Recovery Team in 1993, which produced the Recovery Plan for the Mexican Spotted Owl (Recovery Plan) in 1995 (USDI FWS 1995).

A detailed account of the taxonomy, biology, and reproductive characteristics of the MSO is found in the Final Rule listing the MSO as a threatened species (USDI FWS 1993) and in the Recovery Plan. The information provided in those documents is included herein by reference.

Although the MSO's entire range covers a broad area of the southwestern United States and Mexico, the MSO does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older, multi-canopied forest, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico.

Since the owl was listed, we have completed or have in draft form a total of 140 formal consultations for the MSO. These formal consultations have resulted in a total anticipated incidental take of 327 MSO PACs plus an additional unknown number of MSOs. These consultations have primarily dealt with actions proposed by the Forest Service, Region 3. However, in addition to actions proposed by the Forest Service, Region 3, we have also reviewed the impacts of actions proposed by the Bureau of Indian Affairs, Department of Defense (including Air Force, Army, and Navy), Department of Energy, National Park Service, and Federal Highway Administration. These proposals have included timber sales, road construction, fire/ecosystem management projects (including prescribed natural and management ignited fires), livestock grazing, recreation activities, utility corridors, military and sightseeing overflights, and other activities. Only two of these projects (implementation of the Region 3 Forest Plans without adopting the Recovery Plan and the release of site-specific owl location information) have resulted in biological opinions that the proposed action would likely jeopardize the continued existence of the MSO. To date, we have anticipated take associated with 15 PACs within the Colorado Plateau Recovery Unit.

In 1996, the FWS issued a biological opinion on Forest Service Region 3's adoption of the Recovery Plan recommendations through an amendment of their Forest Plans. In this non-jeopardy biological opinion, we anticipated that approximately 151 PACs would be affected by activities that would result in incidental take of MSOs. To date, consultation on individual actions under the amended Forest Plans has resulted in 233 PACs adversely affected, including the Wildland Urban Interface (WUI) programmatic biological opinion (USDI FWS 2001). In addition, the critical three Recovery Units (the Upper Gila Mountains, Basin and Range-West, and the Basin and Range-East) have either exceeded or are very close to exceeding the amount of take we anticipated in the 1996 biological opinion. Without further, site-specific analysis it is difficult to interpret what this means to the recovery of the MSO (i.e., was most of incidental take short-term disturbance vs. habitat degradation, etc.). However, characterization of all anticipated take to date and an analysis of wildfire effects are under development. Region 3 of the Forest Service reinitiated consultation on the Forest Plans on April 8, 2004.

A reliable estimate of the numbers of owls throughout its entire range is not currently available (USDI FWS 1995) and the quality and quantity of information regarding numbers of MSO vary by source. USDI FWS (1991) reported a total of 2,160 owls throughout the United States. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico. However, Ganey *et al.* (2000) estimates approximately $2,950 \pm 1,067$ (SE) MSOs in the Upper Gila Mountains RU alone. The Forest Service Region 3 most recently reported a total of approximately 987 PACs established on National Forest as of December 1, 2003 (S. Hedwall,

FWS, pers. comm.). Based on this number of MSO sites, total numbers in the United States may range from 987 individuals, assuming each known site was occupied by a single MSO, to 1,960 individuals, assuming each known site was occupied by a pair of MSOs. The Forest Service Region 3 data are the most current compiled information available to us; however, survey efforts in areas other than National Forest System lands have likely resulted in additional sites being located in all Recovery Units. Currently, we estimate that there are likely 12 PACs in Colorado (not all currently designated) and 105 PACs in Utah.

Researchers studied MSO population dynamics on one study site in Arizona ($n = 63$ territories) and one study site in New Mexico ($n = 47$ territories) from 1991 through 2002. The Final Report, titled “Temporal and Spatial Variation in the Demographic Rates of Two Mexican Spotted Owl Populations,” (*in press*) found that reproduction varied greatly over time, while survival varied little. The estimates of the population rate of change (Λ) indicated that the Arizona population was stable (mean Λ from 1993 to 2000 = 0.995; 95% Confidence Interval = 0.836, 1.155) while the New Mexico population declined at an annual rate of about 6% (mean Λ from 1993 to 2000 = 0.937; 95% Confidence Interval = 0.895, 0.979). The study concludes that spotted owl populations could experience great (>20%) fluctuations in numbers from year to year due to the high annual variation in recruitment. However, due to the high annual variation in recruitment, the MSO is then likely very vulnerable to actions that impact adult survival (e.g., habitat alteration, drought, etc.) during years of low recruitment.

Historical and current anthropogenic uses of MSO habitat include both domestic and wild ungulate grazing, recreation, fuels reduction treatments, resource extraction (e.g., timber, oil, gas), and development. These activities have the potential to reduce the quality of MSO nesting, roosting, and foraging habitat, and may cause disturbance during the breeding season. Livestock and wild ungulate grazing is prevalent throughout the range of the MSO and is thought to have a negative effect on the availability of grass cover for prey species. Recreation impacts are increasing in all forests and canyons, especially in meadow and riparian areas. There is both anecdotal information and research which indicate that owls in heavily used recreation areas are much more erratic in their movement patterns and behavior. Fuels reduction treatments, though critical to reducing the risk of catastrophic wildfire, can have short-term adverse effects to MSO through habitat modification and disturbance. As the population grows, especially in Arizona, small communities within and adjacent to Federal lands are being developed. This trend may have detrimental effects to MSO by further fragmenting habitat and increasing disturbance during the breeding season. West Nile Virus also has the potential to adversely impact the MSO. The virus has been documented in all states throughout the U.S. range of the MSO, and preliminary information suggests that owls may be highly vulnerable to this disease. Unfortunately, due to the secretive nature of owls and the lack of intensive monitoring of banded individual birds, we will most likely not know when owls contract the disease or the extent of its impact to MSO range-wide.

Currently, high intensity, stand-replacing fires are influencing ponderosa pine and mixed conifer forest types in Arizona and New Mexico. MSO habitat in the southwestern United States has been shaped over thousands of years by fire. Since MSO occupy a variety of habitats, the

influence and role of fire has most likely varied throughout the owl's range. In 1994, at least 40,000 acres of nesting and roosting habitat were impacted to some degree by catastrophic fire in the Southwestern Region (Sheppard and Farnsworth 1995). Between 1991 and 1996, the Forest Service estimated that approximately 50,000 acres of owl habitat had undergone stand-replacing wildfires (G. Sheppard, Forest Service, Kaibab National Forest, Arizona, pers. comm.). However, since 1996, fire has become catastrophic on a landscape scale and has resulted in hundreds of thousands of acres of habitat lost to stand-replacing fires. This is thought to be a result of unnatural fuel loadings, past grazing and timber practices, and a century of fire suppression efforts. The 2002 Rodeo-Chediski fire, at 462,384 acres, burned through approximately 55 PACs on the Tonto and Apache-Sitgreaves National Forests and the Fort Apache Indian Reservation. Of the 11,986 acres of PAC habitat that burned on National Forest lands, approximately 55% burned at moderate to high severity. Based on the fire severity maps for the fire perimeter, tribal and private lands likely burned in a similar fashion.

Colorado Plateau Recovery Unit

The Colorado Plateau RU is the largest of the six recovery units, extending from southwestern Utah, through northern Arizona, and into northwestern New Mexico and a small portion of the southwestern corner of Colorado. In northern Arizona and New Mexico, owls have been reported in both canyon and montane habitats. Owl habitat in this RU appears to be in the form of isolated, geographically segregated patches. Recent records of MSO exist for the Grand Canyon (approximately 40 PACs) and Kaibab Plateau in Arizona; the Chuska and Carrizo Mountains, Defiance Plateau, and Black Mesa northwest to Navajo Mountain on the Navajo Reservation; and the Zuni Mountains and Mount Taylor in New Mexico. Currently, the Forest Service has designated 22 MSO PACs in this RU on the Mount Taylor Ranger District, Cibola National Forest.

The distribution of MSO within this RU appears to be highly fragmented. The disjunct owl distribution may be a natural occurrence due to the spatial arrangement of habitat, the result of past management, a reflection of inadequate survey efforts, or a combination of all three. Potential threats in the southeastern portion of this RU (Arizona and New Mexico) include timber harvest and/or intensive fuels reduction treatments; overgrazing; catastrophic fire; and oil, gas, and mining development. Sixteen wildland urban interface treatment areas are planned in MSO habitat on the Cibola National Forest, as analyzed in the WUI programmatic opinion. Within these areas, we expect a portion of one PAC to receive intensive fuels reduction treatments and for up to 7,757 acres of protected habitat and 4,000 acres of restricted habitat to be treated. Wildfire data collected from the Forest Service indicate that six fires burned in PACs during the 2002 fire season. The fires ranged in size from 0.1 to 2 acres and did not adversely modify habitat within the activity centers.

Mexican spotted owl Critical Habitat

The final MSO critical habitat rule (USDI FWS 2004) designated approximately 8.6 million acres of critical habitat in Arizona, Colorado, New Mexico, and Utah, mostly on Federal lands.

Within this larger area, proposed critical habitat is limited to areas that meet the definition of protected and restricted habitat, as described in the Recovery Plan. Protected habitat includes all known owl sites and all areas within mixed conifer or pine-oak habitat with slopes greater than 40 percent where timber harvest has not occurred in the past 20 years. Restricted habitat includes mixed conifer forest, pine-oak forest, and riparian areas outside of protected habitat.

There are eight critical habitat units located in the Colorado Plateau RU that contain approximately 3.4 million acres of designated critical habitat. No critical habitat has been designated for the MSO on the Navajo Nation.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

A. Status of the species within the action area

The Navajo Forest is located in the Colorado Plateau Recovery Unit. The MSO is known to occur in the Navajo Forest and canyons surrounding the Forest. MSO habitat in the Forest includes steeply sloped mixed conifer forest on the mountain edges at elevations of 8,000-9,200 feet, and large, deep, rock-walled canyons at lower elevations. The Forest contains the following habitat types: piñon/juniper woodland with ponderosa pine stringers at the lowest elevations; pine/oak and ponderosa pine habitat types at elevations above piñon/juniper; mixed-conifer forest above ponderosa pine; and spruce-fir and subalpine grasslands at the highest elevations. As stated earlier, what is referred to as “pine-oak” on the Navajo Forest does not meet the definition of pine-oak under the Recovery Plan. Riparian areas, springs, streams, lakes, ponds, and wet meadows occur in all habitat types, at all elevations. Cliffs, canyons, and rocky outcrops also occur throughout the Navajo Forest.

Nineteen of 58 timber compartments in the Commercial Forest were surveyed for MSO to protocol during the period 1991 to 1995, and are associated with the following completed/scheduled timber sales:

- Oak Ridge - compartments 1, 2, 4, 5, 6, 7, and 8.
- Sanostee - compartments 35, 41, and 42.
- Toh-ni-tsa - compartments 47, 48, and 55.
- Wheatfields - compartments 29, 30, and 31 (sale completed).
- Whiskey Creek/Ugly Valley - compartments 34, 45, and 50 (sale completed).

PACs have been delineated, per the Recovery Plan, based on historical records and inventory surveys associated with timber sales and other actions. Total PAC area in the Navajo Forest is 10,992 acres. Adding in the portions of those PACs that extend outside the forest boundary (2,165 acres) results in an acreage of 13,157. No other PACs occur within 0.5 mile of the Commercial Forest. The majority of PACs on the Navajo Forest are scattered throughout the forested slopes at the lower edges of the Chuska Mountains. Several are located in canyons adjacent to the Chuska Mountains and Defiance Plateau. The best information available indicates that there could be up to 115,000 acres of MSO nesting/roosting habitat on the Navajo Forest. This estimate is based on vegetation type (mixed conifer) and slopes greater than forty percent. Vegetation information for slopes steeper than forty percent is generally incomplete, and so they may not support suitable nesting or roosting habitat now or in the future. For example, steep south facing slopes are often only capable of supporting scattered woodland species. Therefore, the total habitat acreage given is likely an overestimate of available MSO habitat.

There has been no monitoring of PACs or suitable habitat nor a general analysis of the effects of various disturbances, either man-caused or natural, on the MSO or its habitat (D. Mikesic, NNDFWL, pers. comm.).

B. Factors affecting the species' environment within the action area

In 1997, we issued a biological opinion to BIA Branch of Roads for the reconstruction of Navajo Route N-13 (7)(8). In this non-jeopardy opinion we anticipated take of six MSOs, which would be reduced to two with implementation of the reasonable and prudent measures and their terms and conditions. Since the project began in 1998 there were two subsequent requests for consultation on emergency actions. The first, in 2000, did not change the original incidental take statement, and the second (2003) has not been completed.

In addition, many actions occurred on the Navajo Forest in the past including: forest management; grazing; homesite development; recreation activities; road development and improvement; utility corridor development; small-scale uranium, coal, oil, and gas mining; and military overflights. With the exception of grazing and recreation, few if any of these actions have occurred since the MSO was listed. Those actions that did occur in limited numbers (e.g., road development, residential utilities, mine reclamation) were subject to section 7 consultation. The following information comes from the SPEIS, unless otherwise cited.

Timber was first harvested from the Navajo Forest in the late 1800s. The first FMP, in 1948, established a 25-year harvest period of over-mature timber. The most recent plan (1983-1992) used an even-aged management system with an average annual allowable cut of 40 million board feet. The last timber harvest activities occurred in 1993 prior to the listing of the MSO. MSO surveys were conducted for the last two timber sales, Whiskey Creek/Ugly Valley and Wheatfields, according to Forest Service Region 3 protocol. As a result, four 2,000-acre management territories (MTs) were established and excluded from timber harvest. These MTs were later changed into PACs, per the Recovery Plan.

Grazing is an integral part of Navajo culture and has been practiced for hundreds of years. The number of livestock in the Navajo Forest, reported in sheep units, was 15,675 in 1996 and 26,380 in 1997. These numbers are estimates and some members of the FMP Interdisciplinary Team believe these numbers are low. Based on the BIA's recommended average stocking level of 25 acres per sheep unit and the area of the Navajo Forest, the number of supportable livestock is 24,000. Based on this, the forest rangeland was over-stocked in 1997. Grazing impacts in the Navajo Forest are most evident along stream banks and in riparian areas. Riparian conditions in the Navajo Forest are described as fair to poor for most areas, and poor to excellent for four selected creeks according to two sources cited in the SPEIS.

About 1,460 homesites are in the Navajo Forest. A homesite can cover up to several acres with one or more structures including traditional hogans, one- or two-bedroom modern homes, ramadas, and livestock corrals. Homesites are typically located in accessible areas. A moratorium was placed on new homesite development by the Resources Committee in 1992 pending completion of the FMP (NNDFWL 2000).

The Navajo Forest provides year-round recreational opportunities including camping, boating, fishing, hunting, horseback riding, picnicking, and other activities. About 1,500 acres are designated for recreational use. In the mid-1990s, over 32,000 user days per year were spent on hunting and fishing.

The road system in the Navajo Forest is quite extensive, covering a total area of about 700 acres and accessing most areas of the forest. This system is comprised primarily of logging roads and five major highways.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action later in time, but are still reasonably certain to occur.

In general, forest-management activities may affect MSOs by altering habitat or harassing owls. Owls can be adversely affected by removal of key habitat components such as snags, downed logs and other woody debris, and large trees; or by reducing canopy closure, the variety in tree sizes or species composition, the composition of other plant species, or canopy layers. If activities occur close to an active nest site, there is a risk that the MSO's ability to successfully rear young will be impaired.

PACs are established with nest sites near their center and encompass the best possible owl habitat around the nest site. PACs provide for the closest and most used foraging areas (USDI FWS 1995). Under the FMP, breeding owls, PACs, the mixed-conifer type, and riparian areas will be protected through application of conservation measures and adherence to the Recovery Plan. No activities that may disturb breeding owls will occur within 0.25 to 0.5 mile of a nest site. For particularly intense sound (e.g., blasting) and/or constantly loud sources of noise (e.g., chainsaws), a 0.5 mile buffer will be used, unless it is determined that the sound is buffered by topography or vegetation. Those activities planned within PACs (outside the breeding season) will be for the purpose of protecting stand integrity (e.g., fuels reduction) and will be designed to minimize effects (e.g., trees removed will be less than 9 inches in diameter). PACs will be protected from activities that may disturb breeding owls or degrade habitat. Therefore, any effects to owls or their habitat are anticipated to be negligible.

Furthermore, under the FMP, areas that currently do not support nesting MSOs should develop into suitable nesting habitat. This will be accomplished through excluding the mixed-conifer type and riparian areas from commercial harvest, and by treatments within SMAs that place certain stands on an old-growth trajectory and reduce excessive fuels to reduce the potential for catastrophic wildfire. Maintaining and creating replacement owl habitat is important because the primary limiting factor for the MSO is thought to be the amount of nesting habitat (USDI FWS 1995).

Management activities will take place in the ponderosa pine forest type, which may be used by MSO for foraging, migration, dispersing, and wintering. Forest management potentially may affect foraging habitat by reducing the number of perches and by affecting prey abundance and distribution. These effects would be minimal for two reasons: 1) a significant amount of foraging habitat will be protected by protecting PACs with the conservation measures; and 2) management activities outside of PACs will be guided by ecosystem approaches that provide for additional adequate foraging habitat.

Areas outside PACs will be managed with an ecosystem approach to ensure the existence and development of additional habitat appropriate for foraging. FMP guidelines, taken from the Recovery Plan, include managing for landscape diversity, incorporating natural variation in stand conditions, mimicking natural disturbance patterns, and retaining special features such as snags and large trees. Because owls prey on a variety of species that use different habitats, maintaining or enhancing habitat diversity across the landscape will provide for a more constant food supply. Natural variation and disturbance patterns will also provide for prey species through habitat diversity, while providing for a variety of tree sizes, including those that are downed or partially downed and can be used as perches. Features such as snags and coarse woody material also provide prey habitat. Following these guidelines will allow for FMP activities in foraging habitat without harming owls. Migration, dispersal, and wintering habitats are typically more variable than those used for foraging during the breeding season, and may only be partially represented by vegetation types in the Commercial Forest. Therefore, these other MSO habitats will likewise not be adversely affected.

The FMP proposes developing one new recreation area and one hiking trail. The size, location, and user-capacity of these facilities are not known at this time. The development, building, and subsequent use of the site and trail potentially may affect the MSO if located within or close to a PAC or within habitat that has not been adequately surveyed, resulting in habitat alteration or harassment of owls. The Navajo Nation has stated that any future trails or recreation areas will avoid PACs and mixed-conifer habitat; or if these areas cannot be avoided, the Nation will coordinate with the BIA to enter into further section 7 consultation.

The number and length of roads to be improved at this time are not known. Roads improved in or adjacent to PACs or potential nesting/roosting habitat could affect the owl by altering habitat or harassment. Effects will be avoided or minimized by the conservation measures outlined in the "Proposed Action" section of this biological opinion.

Based on the above analysis, we believe that implementation of the FMP Alternative 4 will not adversely affect the MSO. This conclusion is based on the fact that the FMP implements the Recovery Plan, and thus, at the plan level, effects to the owl are expected to be insignificant or discountable. Project-level activities planned and implemented according to the FMP will not adversely affect the MSO, and should promote recovery. If any projects implemented under the FMP may affect the MSO or its habitat in a manner or to an extent not considered in this plan-level consultation, those projects must undergo further section 7 consultation.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Most actions within the Navajo Forest involving management or planned use of natural resources are subject to BIA oversight, pursuant to Federal Indian trust responsibility. Federal Indian trust responsibility is a legally enforceable fiduciary obligation, on the part of the United States, to protect Tribal lands, assets, resources, and treaty rights, as well as a duty to carry out the mandates of Federal law with respect to American Indian and Alaska Native tribes (USDI OAIT 2003). The BIA administers and manages land held in trust by the United States for American Indians, Indian Tribes, and Alaska Natives. This includes developing forest land, leasing assets on these lands, and directing agricultural programs (USDI BIA 2003) carried out in cooperation with the affected Tribe on a government-to-government basis.

BIA administration and management of Navajo Forest land is a Federal action. Therefore, activities such as grazing and range management, fire management, homesite leasing, and withdrawal of areas for recreation are subject to section 7 consultation and are not considered in the cumulative effects analysis. Most other actions in the Navajo Forest involve isolated small-scale personal Tribal activities, the location and timing of which cannot be reasonably predicted.

CONCLUSION

After reviewing the current status of the MSO, the environmental baseline for the action area, the effects of the proposed Navajo Nation Ten-Year Forest Management Plan, and the cumulative effects, it is our biological opinion that the FMP, as proposed, is not likely to jeopardize the continued existence of the MSO.

The conclusions of this biological opinion are based on full implementation of the project as described in the “Description of the Proposed Action” section of this document, including any Conservation Measures incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. “Harass” is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

We do not anticipate the proposed action will result in the incidental take of any MSO. The FMP incorporates all aspects of the Recovery Plan for the Mexican Spotted Owl relevant to the regulatory jurisdiction of the FMP. This will provide protection for owls, and both occupied habitat and unoccupied areas approaching characteristics of nesting habitat. Therefore, the MSO is not anticipated to be harmed, harassed, or otherwise taken.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend the Branch of Forestry work with the BIA Branch of Natural Resources to facilitate Navajo Nation development of range management plans within the Navajo Forest that incorporate conservation measures for the MSO.
2. We recommend that the Branch of Forestry facilitate Navajo Nation development of a recreation management plan or similar program within the Navajo Forest that incorporates conservation measures for the MSO.

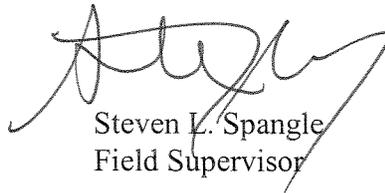
In order for the FWS to be kept informed of action minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in your June 4, 2003 letter. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

For additional communication regarding this project please refer to consultation number 02-21-96-F-0295. Thank you for your continuing efforts to conserve listed species. If we can be of further assistance, please contact John Nystedt at (928) 226-0614 (x104) or Brenda Smith (x101) of our Flagstaff Sub-office.

Sincerely,



Steven L. Spangle
Field Supervisor

cc: Office of the President/Vice President, Navajo Nation, Window Rock, AZ
Director, Navajo Nation Department of Fish and Wildlife, Window Rock, AZ
(Attn: Gloria Tom)
Director, Navajo Nation Forestry Department, Fort Defiance, AZ (Attn: Alex Becenti)
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Wildlife Biologist, Fish and Wildlife Service, Flagstaff, AZ (Attn: Shaula Hedwall)
Field Supervisor, Fish and Wildlife Service, Albuquerque, NM
Office of the Solicitor, Fish and Wildlife Service, Albuquerque, NM (Attn: Janet Spaulding)

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LITERATURE CITED

- Delaney, D.K., T.G. Grubb, P. Beier, L.L. Pater and M. Hildegard Reiser. 1999. Effects of helicopter noise on Mexican spotted owls. *Journal of Wildlife Management* 63(1):60-76.
- Fletcher, K. 1990. Habitat use, abundance, and distribution of the Mexican spotted owl, *Strix occidentalis lucida*, on National Forest System Lands. U.S. Forest Service, Southwestern Region, Albuquerque, New Mexico. 78 pp.
- Ganey, J.L., G.C. White, A.B. Franklin, J.P. Ward, Jr., and D.C. Bowden. 2000. A pilot study on monitoring populations of Mexican spotted owls in Arizona and New Mexico: second interim report. 41 pp.
- Navajo Nation Fish and Wildlife Department. 2000. The Navajo Nation Management Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*). Window Rock, Arizona. 32 pp. with Appendices.
- Navajo Nation Forestry Department. 2001. Navajo Nation 10-Year Forest Management Plan. Navajo Nation. Fort Defiance, Arizona. 65 pp. with Appendices.
- Seamans, M.E., R.J. Gutierrez, C.A. May, and M.Z. Peery. 1999. Demography of two Mexican spotted owl populations. *Conservation Biology* 13(4):744-754.
- Sheppard, G. and A. Farnsworth. 1995. Fire effects and the use of prescribed fire in Mexican spotted owl habitat. *In* Proceedings First Conference on Fire Effects on Rare and Endangered Species and Habitats Conference, November 13-16, 1995. Coeur d' Alene, Idaho. Pgs 131-135.
- SWCA Inc. Environmental Consultants. 1998. Final Biological Assessment for the Defiance Plateau/Chuska Mountains Forest Area 10-Year Forest Management Plan. Flagstaff, Arizona. 34 pp. with Appendices.
- U.S. Department of Agriculture, Forest Service, Southwestern Region. 2001. Biological Assessment and Evaluation, Urban Interface Fuel Treatment, February 28, 2001. 271 pp.
- U.S. Department of the Interior, Bureau of Indian Affairs. 2003. Bureau of Indian Affairs Webpage, <http://www.doi.gov/bureau-indian-affairs.html/>.
- U.S. Department of the Interior, Bureau of Indian Affairs. 2004. Draft Supplemental Programmatic Environmental Impact Statement for the Navajo Nation 10-Year Forest Management Plan Alternatives. Navajo Nation Forest. Gallup, New Mexico. 134 pp. with Appendices.

- U.S. Department of the Interior, Fish and Wildlife Service. 1991. Mexican spotted owl status review. Endangered species report 20. Albuquerque, New Mexico.
- U.S. Department of the Interior, Fish and Wildlife Service. 1993. Endangered and Threatened Wildlife and Plants; final rule to list the Mexican spotted owl as threatened. Federal Register. 58(49):14248-14271. March 16, 1993.
- U.S. Department of the Interior, Fish and Wildlife Service. 1995. Recovery Plan for the Mexican Spotted Owl. Albuquerque, New Mexico.
- U.S. Department of the Interior, Fish and Wildlife Service. April 10, 2001. Biological opinion on the Forest Service's proposed wildland urban interface fuel treatments in New Mexico and Arizona, R2/ES-TE, CL 04-005. U.S. Fish and Wildlife Service, Region 2, Albuquerque, New Mexico.
- U.S. Department of Interior, Fish and Wildlife Service. 2004. Endangered and Threatened Wildlife and Plants; final designation of critical habitat for the Mexican spotted owl; final rule. Federal Register 69(168):53182-53298. August 31, 2004.
- U.S. Department of the Interior, Office of American Indian Trust. 2003. Office of American Indian Trust Webpage, <http://www.doi.gov/oait/>.