

United States Department of the Interior
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 FAX: (602) 242-2513

In Reply Refer To:
AESO/SE
02-21-04-F-0430

February 1, 2005

Mr. M. Stephen Best
District Ranger
Williams Ranger District
742 South Clover Road
Williams, Arizona 86046-9122

RE: Biological Opinion for Previously Approved Vegetative Treatment Projects, Ongoing Personal-Use Firewood Cutting, and Wildland Fire Use

Dear Mr. Best:

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 (Act). Your request for formal conference on proposed critical habitat for the Mexican spotted owl (MSO) (*Strix occidentalis lucida*) was dated August 17, 2004, and received by us on August 19, 2004. The final critical habitat designation for the MSO became effective on September 30, 2004. An October 7, 2004, email message from your staff modified the request to formal consultation on designated critical habitat. A November 5, 2004, email message from your staff stated that two projects were excluded from the critical habitat rule and consultation on these projects was no longer necessary. At issue are impacts that may result from the ongoing Frenchy Vegetative Treatment Project, Elk-Lee Vegetative Treatment Project, Wildland Fire Use (formerly known as Prescribed Natural Fire), and Ongoing Personal Use Firewood Cutting located in Coconino County, Arizona. All of the ongoing actions may affect designated MSO critical habitat. This formal consultation addresses the adverse effects of Ongoing Personal Use Firewood Cutting to the MSO as well as to MSO critical habitat. Except for this project, all of the other ongoing projects have been consulted on for effects to the MSO.

This biological opinion is based on information provided in a biological evaluation (BE), a supplement to the BE, email messages, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, the type of actions and their effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

Table 1 is a summary of the consultation history for the four ongoing projects. All tables are included at the end of this document.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Most of the information in this section is from the BE and a supplement (Nielsen 2000a, 2000b). The proposed action consists of two components. One component is continued implementation of two vegetative treatment (Frenchy and Elk-Lee) projects, ongoing personal-use firewood cutting, and wildland fire use that occur within designated MSO critical habitat (BE; Nielsen 2004). Except for ongoing personal-use firewood cutting, the projects received previous consultation for listed species. The other component is ongoing personal-use firewood cutting and its effects on the MSO. The specific projects are described below. All conservation measures that apply to restricted or protected MSO habitat are part of the ongoing actions.

Frenchy Vegetative Treatment Project

This project includes vegetative and fuels treatments, regeneration treatments, road closure and obliteration, and seeding of native grasses and forbs within the Frenchy Ecosystem Management Unit. The vegetative treatments include 8,227 acres of commercial and 1,092 acres of noncommercial treatments: irregular thinning (2,903 acres), regular thinning (231 acres), group selection (1,901 acres), full or partial restoration of meadows and savannahs (3,733 acres), oak/juniper release (2,234 acres), yellow pine tending (2,693 acres), noncommercial thinning/sanitation (7,661 acres), individual tree selection (36 acres), irregular shelterwood (27 acres), dwarf mistletoe buffer (16 acres), and oak thinning (132 acres). Many of these treatments will occur in conjunction with, or following, other treatments of the same area. Fuels treatments include treatment of slash via pile burning or lopping and scattering, followed by broadcast burning of the area.

Adverse effects of the project to the MSO were addressed in a biological opinion (02-21-99-F-0009) issued on April 5, 2002. Consideration of effects to MSO critical habitat was not included in that consultation because critical habitat was not designated in the action area at that time. The detailed description of the project in the biological opinion is incorporated here by reference.

This Kaibab National Forest approved this project on February 24, 2003, and began implementation shortly thereafter. Implementation is likely to continue over the next eight to ten years.

Conservation Measures for the Frenchy Vegetative Treatment Project

- Hard and soft snags ≥ 30 feet high and ≥ 10 inches in diameter at breast height (dbh), and down logs ≥ 12 inches in mid-point diameter and ≥ 8 feet long, will be protected from fire using various fire management techniques, such as applying water or foam, hand lining, burning under cooler prescriptions, and changing burn patterns.
- Yellow pine ≥ 16 inches dbh, and Gambel oak ≥ 10 inches in diameter at root collar (drc), will be protected from fire through the removal of heavy fuels from around the base of those trees, or by methods listed above for snags and downed logs.
- Burned areas will be rested from grazing for one season to allow both cool and warm season plants to complete a reproductive cycle prior to continuing grazing.
- The maximum acceptable loss of downed logs ≥ 12 inches in mid-point diameter and ≥ 8 feet long in MSO restricted and target/threshold habitat will be $\leq 25\%$. To achieve this, additional lining of these downed logs along with other pre-burn and burn strategies will be used.
- In MSO restricted habitat, any tree > 18 inches that will be removed by prescription will be killed and left standing rather than felled.
- No non-mistletoe infected pine > 18 inches dbh will be removed in MSO restricted habitat that is scheduled for restoration vegetative treatments.
- No oak > 5 inches drc will be cut in MSO restricted or target/threshold habitat.
- Pre- and post- microhabitat monitoring will be conducted for all silvicultural and prescribed fire activities in restricted and protected habitat.
- No trees > 24 inches dbh will be felled or killed in MSO restricted pine-oak habitat.
- No non-mistletoe infected yellow pine will be cut or killed in MSO restricted pine-oak habitat.

Elk-Lee Vegetative Treatment Project

The Elk-Lee Vegetative Treatment Project consists of vegetative treatments of both mechanical and prescribed fire across 8,152 acres, personal fuelwood harvest, closure of approximately 22 miles of roads, construction of six roadside water collection tanks, reconstruction of the Holloway Spring development, road maintenance (culvert installation) at Perkins Tank, and construction of a cinder parking facility near Elk Tank along Forest Service Road 11. Vegetative treatments include pine regeneration (405 acres), group selection (1,378 acres), irregular thinning (1,281 acres), sanitation cutting (240 acres), meadow enhancement/restoration (748 acres), irregular shelterwood (192 acres), shelterwood (21 acres), oak release/thinning (14 acres), additional oak thinning (129 acres), precommercial thinning (153 acres), large tree release (153

acres), and seeding with native grasses and forbs (2,077 acres). Many of these treatments will occur in conjunction with, or following, other treatments of the same area. Prescribed fire will include broadcast burning of the entire area.

This project received previous informal consultation. On May 19, 1997, we issued a letter with recommended modifications to the proposed action. The letter stated that if the modifications would be incorporated, we would be able to concur with a “not likely to adversely affect” determination. The Forest Service responded with a June 9, 1997, letter stating that the measures would be implemented as part of the project.

This project was approved by the Forest Service on June 12, 1997. Some portions of this project have been implemented.

Conservation Measures for the Elk-Lee Vegetative Treatment Project

- Yellow pines that are not infected with dwarf mistletoe will not be cut. Some of the dwarf mistletoe-infected yellow pine trees and other large pines may be killed and left standing to become snags for wildlife.
- Yellow pines, large junipers, and large oaks will be retained in meadow enhancement/restoration treatments.
- All large Gambel oaks >8 inches dbh, all trees >24 inches dbh, a minimum of 2-4 large downed logs >12 inches at midpoint per acre, and all snags that are not a hazard as defined by OSHA regulations will be retained within all restricted pine-oak habitat by avoiding direct ignition, using appropriate lighting patterns and cool burning prescriptions, lining snags, and removing heavy material away from the base of the large tree component.
- No oak will be harvested within any of the stands designated to be developed for MSO habitat threshold conditions.
- No trees >24 inches will be cut or killed (girdled) in MSO pine-oak restricted habitat.
- An average of one tree per acre \geq 18 inches dbh that would come out under prescription will be killed and retained as a snag.
- All pine trees >24 inches dbh that would come out under prescription will be retained as snags.

Pre- and post-treatment microhabitat monitoring will be conducted for all silvicultural and prescribed fire activities in restricted pine-oak habitat.

Ongoing Personal-Use Firewood Cutting

This action involves continued issuance of firewood cutting permits for personal use. On average, about 600 paid permits and 200 free permits are issued per year on the zone. The paid permits allow cutting of 4-6 cords of wood each (with an average of approximately 4.5 cords per permit), while the free permits allow for cutting of 4 cords of wood each. Permits allow for the removal of snags or downed wood or, under Green Wood Permits, standing, green pinyon pine and juniper (except alligator juniper) trees. Paid personal-use firewood permits apply to most of the zone, except for closed areas. Some areas are temporarily closed to avoid conflicts with commercial operations, while others are permanently closed to protect resources. Personal use firewood cutting is encouraged in some designated areas, where ponderosa pine or pinyon-juniper slash is present. Free permits apply to designated areas, usually with ponderosa pine slash. The effects of portions of this project to MSO have not previously been addressed through consultation.

Conservation Measures for Ongoing Personal-Use Firewood Cutting

- Any oak snags cut must be ≤ 8 inches in diameter or ≤ 12 feet high.
- To avoid accidental cutting of live oak trees, the cutting season for oak snags is from June 1 – September 30.
- Any aspen snags cut must be ≤ 12 inches in diameter or ≤ 12 feet high.
- Any pinyon pine snags cut must be ≤ 10 inches in diameter or ≤ 12 feet high.
- Any ponderosa pine snags cut must be ≤ 12 inches in diameter or ≤ 15 feet high.

Wildland Fire Use

This action allows, under specified conditions, for low- to moderate-intensity burning caused by lightning strikes. The project area encompasses all Forest Service lands within the zone, or 331,789 acres on the Tusayan Ranger District and 613,718 acres on the Williams Ranger District in a variety of vegetation types. The wildland fire use process involves daily decision making to assess whether wildland fire would continue to be managed to improve resources or if control through suppression is necessary. If any of the specified environmental conditions are exceeded, then a wildland fire would not be allowed to continue and may need to be suppressed.

Adverse effects of the project to the MSO were addressed in a biological opinion (02-21-98-F-0246) issued on April 30, 1999. Consideration of effects to MSO critical habitat was not included in that consultation because critical habitat was not designated in the action area at that time. The detailed description of the project in that biological opinion is incorporated here by reference.

Conservation Measures for Wildland Fire Use

Implementation of Wildland Fire Use

- The Forest Service shall ensure that all pertinent information from the reasonable and prudent measures in the biological opinion is included in the final burn plans for all wildland fire use actions.
- All field personnel who implement any portion of the proposed action shall be informed of regulations and protective measures for the MSO. A wildlife biologist will present an hour-long program regarding the management of fire in threatened and endangered species habitat to all personnel involved in the fire use program.
- The Forest will notify the FWS within five working days of any declared wildland fire in restricted or protected MSO habitat within the project area.
- When a natural ignition occurs in MSO habitat, a wildlife biologist will provide input for determining the maximum allowable perimeter to which the wildland fire would be limited.
- Where individual wildland fire situations and workforce allow, material ≥ 6 inches in size will be removed from the base of ponderosa pine trees ≥ 16 inches dbh; oak trees ≥ 10 inches dbh; and alligator juniper trees ≥ 30 inches dbh. In addition, all snags ≥ 18 inches dbh will be lined. Also, downed logs will not be purposely ignited and no material will be piled on them.
- An average of two or more logs per acre will be retained in restricted and protected MSO habitat.
- No more than 10% of the canopy of each MSO Protected Activity Center (PAC) will be affected by torching.
- The size of gaps or openings created by wildland fire will not exceed 2 acres in protected MSO habitat. In restricted MSO habitat, the intent is to limit openings to up to 2 acres, recognizing that this may occasionally be exceeded.
- The specific conditions/prescriptions for wildland fires within MSO habitat are listed in Table 2.
- Fires will be managed with cooler prescriptions in protected MSO habitat, thereby setting a 'lighter trigger' on possible suppression action in these areas.
- The Forest Service shall suppress all wildland fire actions if they anticipate that the fire may burn out of prescription in the following 24 hours, or the Forest Service may choose to suppress wildland fire prior to this determination.

- As a wildland fire is reviewed every 24 hours after ignition, a wildlife biologist for the Forest will review the fire progress, foreseeable weather conditions, and expected fire behavior as it pertains to listed species, and provide recommendations for the daily decision process.
- Livestock grazing will be deferred from a wildland fire area for one growing season. The Forest Service will allow no grazing in areas where wildland fire or wildfire has occurred in PACS for a minimum period of one full year after the fire; if no seed head production has occurred by the end of one full year, they will not allow grazing until seed head production has occurred.

Implementation of Suppression Actions

- Minimum Impact Suppression Tactics will be applied in MSO habitat in the event a wildland fire becomes a wildfire; firefighter and public safety are given primary consideration. All fire suppression actions in PACs will occur, to the maximum extent possible, using 'light on the land' methods. This will include not removing trees ≥ 9 inches dbh unless deemed necessary to prevent the fire from affecting additional PAC acres.
- If a wildland fire escapes in or near MSO habitat, and is declared a wildfire, emergency consultation on fire suppression actions will be initiated.
- Fire camps, staging areas, and any other areas of disturbance created for fire suppression actions shall be located outside of MSO PACs.
- Patches of unburned vegetation within burned areas shall not be burned out as a fire suppression measure, except as needed to secure the fire perimeter or provide for fire fighter safety.
- A Resource Advisor familiar with listed species locations and concerns will be available if a wildland fire escapes and is declared a wildfire. The Resource Advisor will also be available for all suppression activities associated with wildland fire, or wildfires resulting from wildland fire use, in MSO habitat. Resource Advisors shall be provided adequate information from qualified biologists with knowledge of the MSO and its habitat. The Resource Advisor shall possess maps of all PACs and all potential nest/roost habitat in the project area and vicinity. The Resource Advisor shall coordinate MSO concerns and serve as an advisor to the Incident Commander/Incident Management Team. Resource Advisors shall also serve as field contact representatives responsible for coordination with the USFWS. They shall monitor fire suppression activities to ensure protective measures endorsed by the Incident Commander/Incident Management Team are implemented.
- Wildfire rehabilitation in habitat of listed species shall promote the protection and restoration of the area. Restricted and protected MSO habitat disturbed during fire suppression activities associated with wildland fire events, such as fire lines, crew camps,

and staging areas, shall be rehabilitated, including the obliteration of fire lines to prevent their use by vehicles or hikers. The effectiveness of such closures shall be monitored on a yearly basis.

Monitoring, Reporting, and Planning

- The Forest Service will ensure that sufficient monitoring of the effects of fire on key habitat components of MSO habitat will be conducted after each wildland fire event. The intent of this required monitoring is to completely and adequately determine the effects of the wildland fire event on the key habitat components. The Forest Service, as a minimum, will accomplish qualitative walk-throughs during and after the events. A summary narrative and photographs fully and completely explaining the effects of the event on the key habitat components will be produced. Each monitoring report will include a description of the prescription under which the wildland fire event occurred. The Forest Service will provide these reports to the FWS as soon as possible.
- Additional monitoring in restricted and protected MSO habitat will involve establishing an appropriate number of transect lines within each wildland fire area after a wildland fire event. The lines will be established as soon as mortality or damage of trees is expected to be evident, and no later than six months after the event. The first 100 oaks and 100 large conifer trees will be identified along each line and classified as living, dead, or likely to die. If more than 10% of oaks or 10% of large conifer trees are dead or dying, then that information will be provided to the FWS immediately to determine if reconsultation on this project is required.
- If the prescriptions in Table 2 are not sufficiently retaining key components of MSO habitat, the values of the various parameters of the prescriptions will need to be modified to ensure the components will be retained.
- The Forest Service will review actions after each year of activity prior to further wildland fire use within the project area. Such review will take into account the cumulative effects of all fire activities in the project area. An annual report from the Forest and an annual meeting with the FWS will occur if any wildland fire is managed within MSO habitat. By February 1 of each year, prior to further wildland fire use that year, the Forest Service will submit the report to the Arizona Ecological Service Office detailing the previous year's actions. The report will document the areas and acreage burned, the type of fire (management ignited fire, wildland fire, wildfire), the name(s) of any PAC(s) affected, the amount of unoccupied MSO habitat affected, the extent of any suppression actions, the effectiveness of the terms and conditions in the biological opinion, information about MSO monitored or encountered, any rehabilitation completed, quantification of any incidental take as defined in the biological opinion, and any recommendations for actions in the upcoming year(s). A map will be provided to the FWS of fire that occurs each year. The Forest Service will keep and maintain a map depicting cumulative fire information for the project area. By March 1 of each year, prior to any wildland fire implementation that year, the Forest Service will meet with the Arizona Ecological

Services Office to review the report and discuss the following year's actions relative to the previous year's actions and cumulative actions.

- The Forest Service will ensure that no more than 700 acres of unsurveyed, potential MSO nest/roost habitat is affected by wildland fire each year.
- Combined management-ignited fire, wildland fire, and wildfire shall not affect more than 35,000 acres, or 50% of the approximately 70,000 total acres of PACs and restricted and protected MSO habitat, during the life of this project. As this figure is approached, re-negotiation with the FWS can occur regarding the further use of wildland fire.

STATUS OF THE SPECIES

Mexican Spotted Owl

The MSO was listed as a threatened species in 1993 (USDI 1993). The primary threats to the species were cited as even-aged timber harvest and 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 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 1993) and in the Recovery Plan (USDI 1995). The information provided in those documents is included herein by reference. Although the MSOs 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, uneven-aged forest, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico.

The U.S. range of the MSO has been divided into six recovery units (RU), as discussed in the Recovery Plan. The primary administrator of lands supporting the MSO in the United States is the Forest Service. Most owls have been found within Forest Service Region 3 (including 11 National Forests in Arizona and New Mexico). Forest Service Regions 2 and 4 (including two National Forests in Colorado and three in Utah) support fewer owls. According to the Recovery Plan, 91 percent of MSO known to exist in the United States between 1990 and 1993 occurred on lands administered by the Forest Service.

The Upper Gila Mountains RU is a relatively narrow band bounded on the north by the Colorado Plateau RU and to the south by the Basin and Range-West RU. The southern boundary of this RU includes the drainages below the Mogollon Rim in central and eastern Arizona. The eastern boundary extends to the Black, Mimbres, San Mateo, and Magdalena mountain ranges of New Mexico. The northern and western boundaries extend to the San Francisco Peaks and Bill Williams Mountain north and west of Flagstaff, Arizona. This is a topographically complex area consisting of steep foothills and high plateaus dissected by deep, forested drainages. This RU

can be considered a "transition zone" because it is an interface between two major biotic regions: the Colorado Plateau and Basin and Range Provinces (Wilson 1969). The Kaibab, Coconino, Apache-Sitgreaves, Tonto, Cibola, and Gila National Forests administer most habitat within this RU. The north half of the Fort Apache and northeastern corner of the San Carlos Indian reservations are located in the center of this RU and also support MSO.

The Upper Gila Mountains RU consists of pinyon/juniper woodland, ponderosa pine/mixed conifer forest, some spruce/fir forest, and deciduous riparian forest in mid- and lower-elevation canyon habitat. Climate is characterized by cold winters and over half the precipitation falls during the growing season. Much of the mature stand component on the gentle slopes surrounding the canyons had been partially or completely harvested prior to the species' listing as threatened in 1993; however, MSO nesting habitat remains in steeper areas. MSO are widely distributed and use a variety of habitats within this RU. Owls most commonly nest and roost in mixed-conifer forests dominated by Douglas fir and/or white fir, and canyons with varying degrees of forest cover (Ganey and Balda 1989, USDI 1995). Owls also nest and roost in ponderosa pine-Gambel oak forest, where they are typically found in stands containing well-developed understories of Gambel oak (USDI 1995).

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 Region 3 National Forest lands and is thought to have a negative effect on the availability of grass cover for prey species. Recreation impacts are increasing on all forests, especially in meadow and riparian areas. There is anecdotal information and research that indicates 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 National Forest System 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 Arizona, New Mexico, and Colorado, and preliminary information suggests that owls may be highly vulnerable to this disease. Unfortunately, due 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 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 has 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 White Mountain Apache 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.

Currently, catastrophic wildfire is probably the greatest threat to MSO within the Upper Gila Mountains RU. As throughout the West, fire intensity and size have been increasing within this geographic area. Table 3 shows several high-intensity fires that have had a large influence on MSO habitat in this RU in the last decade. Obviously the information in Table 3 is not a comprehensive analysis of fires in the Upper Gila Mountains RU or the effects to MSO. However, the information does illustrate the influence that stand-replacing fire has on current and future MSO habitat in this RU. This list of fires alone estimates that approximately 11% of the PAC habitat within the RU suffered high-to moderate-intensity, stand-replacing fire in the last seven years.

A reliable estimate of the numbers of owls throughout its entire range is not currently available (USDI 1995) and the quality and quantity of information regarding numbers of MSO vary by source. USDI (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 ($\approx 1,067$ (SE)) MSOs in the Upper Gila Mountains RU alone. The Forest Service Region 3 most recently reported a total of approximately 980 protected activity centers (PACs) established on National Forest lands in Arizona and New Mexico (USDA Forest Service, Southwestern Region, December 19, 2002). Based on this number of MSO sites, total numbers in the United States may range from 980 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 initial publication of the findings reported that both study populations were declining at $\geq 10\%$ a year and that owl survival rates in Arizona may be declining over time (Seamans *et al.* 1999). The authors noted two possible reasons for the population decline were declines in habitat quality and regional trends in climate. 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 ($\Lambda = \text{Lamda}$) 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.

Since the owl was listed, we have completed or have in draft form a total of 141 formal consultations for the MSO. These formal consultations have identified incidences of anticipated incidental take of MSO in 327 PACs. The form of this incidental take is almost entirely harm or harassment. 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 (release of site-specific owl location information and existing forest plans) have resulted in biological opinions that the proposed action would likely jeopardize the continued existence of the MSO.

In 1996, we 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, with approximately 91 of those PACs located in the Upper Gila Mountains RU. In addition, on January 17, 2003, we completed a reinitiation of the 1996 Forest Plan Amendments biological opinion, which anticipated the additional incidental take of five MSO PACs in Region 3 due to the rate of implementation of the grazing standards and guidelines, for a total of 156 PACs. To date, consultation on individual actions under the amended Forest Plans has resulted in 233 PACs adversely affected, with 126 of those in the Upper Gila Mountains RU. Region 3 of the Forest Service reinitiated consultation on the Forest Plans on April 8, 2004.

Mexican Spotted Owl Critical Habitat

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

The primary constituent elements for proposed MSO critical habitat were determined from studies of their habitat requirements and information provided in the Recovery Plan (USDI 1995). Since owl habitat can include both canyon and forested areas, primary constituent

elements were identified in both areas. The primary constituent elements which occur for the MSO within mixed-conifer, pine-oak, and riparian forest types that provide for one or more of the MSOs habitat needs for nesting, roosting, foraging, and dispersing are in areas defined by the following features for forest structure and prey species habitat:

Primary constituent elements related to forest structure include:

- A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30% to 45% of which are large trees with dbh of 12 inches or more;
- A shade canopy created by the tree branches covering 40% or more of the ground; and,
- Large, dead trees (snags) with a dbh of at least 12 inches.

Primary constituent elements related to the maintenance of adequate prey species include:

- High volumes of fallen trees and other woody debris;
- A wide range of tree and plant species, including hardwoods; and
- Adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration.

The forest habitat attributes listed above usually are present with increasing forest age, but their occurrence may vary by location, past forest management practices or natural disturbance events, forest-type productivity, and plant succession. These characteristics may also be observed in younger stands, especially when the stands contain remnant large trees or patches of large trees. Certain forest management practices may also enhance tree growth and mature stand characteristics where the older, larger trees are allowed to persist.

There are 13 critical habitat units located in the Upper Gila Mountains RU that contain 3.1 million acres of designated critical habitat.

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 which 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

Mexican Spotted Owl (Ongoing Personal-Use Firewood Cutting)

The action area is generally characterized by flat terrain, punctuated by several cinder hills and mountains (Nielsen 2000b). Dominant vegetation types within these areas include ponderosa pine, ponderosa pine-Gambel oak, grassland, pinyon-juniper, and scattered aspen. Mixed conifer is also present on upper slopes of Bill Williams, Sitgreaves, and Kendrick mountains. Most forests within the action area are uncharacteristically dense with small- and medium-diameter trees. The amount of MSO habitat within the action area, excluding permanent fuelwood closure areas, is provided in Table 4.

Some of the MSO habitat within the action area has been surveyed to Forest Service and Fish and Wildlife Service MSO survey protocol (Table 5). MSO detections from the surveys and informal monitoring resulted in delineation of six MSO PACs on the south zone. All six MSO PACs occur within the Williams Ranger District on Bill Williams, Sitgreaves, and Kendrick mountains and in Tule and Sycamore canyons.

Mexican Spotted Owl Critical Habitat (All Four Ongoing Projects)

Three MSO critical habitat units (UGM-13, 15, and 17) occur on the south zone of the Kaibab National Forest. The amount of MSO critical habitat within the vegetative treatment, personal-use firewood cutting, and wildland fire use areas is summarized by project in Table 6.

B. FACTORS AFFECTING SPECIES' ENVIRONMENT WITHIN THE ACTION AREA

Mexican Spotted Owl and Mexican Spotted Owl Critical Habitat

This biological opinion does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

Factors affecting the species' environment within the action area were previously identified and evaluated in the biological opinions for the Frenchy Vegetative Treatment Project (02-21-99-F-0009) and Wildland Fire Use (02-21-98-F-0246). That identification and evaluation are incorporated here by reference. The factors have not changed greatly since those biological opinions were issued. We are aware of several actions (Table 7) involving MSO and/or MSO critical habitat planned for the south zone since the issuance of the biological opinions cited above.

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 and are later in time, but are still reasonably certain to occur.

Effects of the Vegetation Treatment Projects, Ongoing Personal-Use Firewood Cutting, and Wildland Fire Use on MSO Critical Habitat

Effects of vegetative treatments are derived from stand exams and simulations maintained by the zone Silviculturalist (Nielsen 2004a). Effects of fuels treatments are derived from fire effects monitoring and simulations maintained by the zone Fuels Program Manager. Effects of the vegetative treatment and fuels reduction projects and personal-use firewood cutting and wildland fire use on the eight primary constituent elements are identified in Table 8.

Most adverse effects are of temporary and localized nature, with losses reduced by project conservation measures and succeeded by long-term beneficial effects. In addition, a high proportion of most primary constituent elements will remain after the treatments. With all prescribed fire treatments and wildland fire use, there is a small potential for fire escape, which could result in longer-term destruction of primary constituent elements. However, owing to conservative burning prescriptions for these actions and other measures to prevent prescribed fire escape, the potential for significant loss of primary constituent elements from these management actions is small.

Effects of Ongoing Personal-Use Firewood Cutting on the MSO

Adverse effects to the MSO and its habitat from the proposed action include items identified in Table 8 for this project. Some large snags may be taken illegally (Nielsen 2004b). An assessment of snag loss was conducted in 2000. Of 48 marked snags (of which seven were greater than or equal to 12 inches dbh), illegal take of one large oak snag was observed. Loss of large snags from illegal activities, as well as associated human disturbance, may be minimal in areas away from roads.

An assessment of personal fuelwood cutting in pine-oak habitat on the Williams Ranger District was conducted in 2000. The assessment focused on heavy use areas near roads in areas with heavy traffic of fuelwood cutters. Thirty-two 0.5-acre plots were monitored. No change was observed in 25 (78%) of the plots indicating that no cutting had occurred on the plots. One hundred and ten logs were marked prior to the cutting season. The monitoring revealed that 9 logs (8%) were removed.

The adverse effects to MSO habitat, particularly reduced volumes of logs and small snags, may result in decreased abundance of MSO prey in MSO habitat that is accessible to personal fuelwood cutting. These potential decreases in MSO prey abundance could result in decreased foraging success of MSO within these areas. Personal fuelwood cutting does not occur within MSO PACs because of permanent closures (Bill Williams Mountain, Kendrick Mountain, Newman, and Pumpkin PACs) and/or inaccessible, steep terrain (Tule Canyon, Sycamore Canyon, and Sitgreaves Mountain PACs). Protected steep slopes and restricted habitat

associated with canyons or slopes are not likely to be affected because of topographically and logistically difficult access from steep terrain and fewer roads in these areas.

Although personal fuelwood cutting is likely to occur within easily accessible MSO habitat during the MSO breeding season, the likelihood of impacts to MSO individuals from disturbance is relatively low. Personal fuelwood cutting does not occur within MSO PACs and is not likely to occur on protected steep slopes or restricted habitat associated with canyons or slopes, where MSO are most likely to occur. Therefore, it is unlikely that the proposed action will cause disturbance that would affect nesting MSO.

However, even with restrictions and closures in place, illegal firewood cutting likely occurs in MSO habitat. Not all firewood cutters are likely to comply with all of the restrictions on species, sizes, and area closures. Lack of resources for enforcement and relatively easy access to MSO habitat are likely to facilitate non-compliance with firewood cutting restrictions. The few monitoring results cited above are not adequate to determine the extent of firewood cutting that does not comply (either purposely or inadvertently) with the firewood cutting restrictions. Thus, there is an unknown amount of loss of habitat components and disturbance of MSO. This is the case especially for the Gambel oak hardwood component. Chambers (2002) suggested that Gambel oak may be declining in northern Arizona due to a variety of causes including illegal firewood cutting. Loss of large-diameter oak trees and snags near roads was a particular concern. Chambers found that in the ponderosa pine-Gambel oak stands that she examined on the Kaibab National Forest, most of the oak was in the smallest size classes. She observed that firewood cutters tended to take mature trees and often subsequently abandoned cut trees if they were found to be hollow. She observed signs of oak harvest near the roosting and nesting areas of the vertebrates (although not MSO) she was studying, and suggested that the replacement rate of large oak trees may be too slow to maintain nesting and roosting habitat for those species.

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 Act.

The Forest Service did not provide information regarding cumulative effects associated with the ongoing actions. Cumulative effects were addressed in the biological opinions for the Frenchy Vegetative Treatment Project (02-21-99-F-0009) and Wildland Fire Use (02-21-98-F-0246). Those analyses of cumulative effects are incorporated here by reference.

CONCLUSION

After reviewing the current status of the MSO and MSO critical habitat, the environmental baseline for the action area, the effects of the proposed ongoing actions and the cumulative effects, it is the FWS's biological opinion that the ongoing actions are not likely to jeopardize the continued existence of the MSO, and are not likely to destroy or adversely modify designated MSO critical habitat.

We present these conclusions for the following reasons:

1. Three (Frenchy, Elk-Lee, and Wildland Fire Use) of the four projects were previously found not likely to jeopardize the MSO, and we are unaware of any changes that would alter our previous conclusions.
2. While key habitat components of MSO habitat will be adversely affected by ongoing personal-use firewood cutting, conservation measures and the scope of the project minimize and limit these effects.
3. While primary constituent elements of MSO critical habitat will be adversely affected by all four ongoing projects, conservation measures and the scope of the projects minimize and limit these effects. These projects therefore will not have an appreciable effect on the primary constituent elements of critical habitat nor on the value of critical habitat for the conservation 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 that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the 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 behavior 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, the carrying out of 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 Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

In our biological opinion for Wildland Fire Use (02-21-98-F-246), we anticipated that the proposed action could result in incidental take of MSO. The anticipated incidental take was addressed in that biological opinion. In our biological opinion for the Frenchy Vegetative Treatment Project (02-21-99-F-0009), we did not anticipate any incidental take of MSO. Consultation on the Elk-Lee Vegetative Treatment Project (02-21-95-I-0268) was concluded informally; no incidental take was anticipated.

We do not anticipate that ongoing personal-use firewood cutting will result in the incidental take of MSO for the following reasons:

1. The conservation measures (firewood cutting restrictions) will help reduce the loss of key components of MSO habitat.
2. The firewood cutting closures in and/or the inaccessible terrain of the MSO PACs will help reduce the disturbance impacts of wood cutting to MSO and limit the loss of large oaks.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act 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.

The effects of three of the four projects on the MSO and its habitat have previously been addressed by a variety of conservation measures and reasonable and prudent measures. Most of those measures will also provide some protection to MSO critical habitat.

1. We recommend that all efforts be made to ensure enforcement of the firewood cutting restrictions (e.g., cutting season, size restrictions, PAC closures). Such efforts could include personally reviewing the restrictions and closed areas with permittees when they obtain permits, ensuring there are sufficient patrols within the closures, and installing closure signs along the roads in the closed areas.
2. We recommend additional study and monitoring of the loss of key habitat components due to firewood cutting (legal and illegal). The monitoring should be designed to obtain a better understanding of the actual loss of the components, particularly oaks, snags, and downed logs in MSO habitat.

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

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. 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 the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The FWS appreciates the Forest Service's efforts to identify and minimize effects to listed species from this project. For further information please contact Bill Austin (928) 226-0614 (x102) or Brenda Smith (x101). Please refer to consultation number 02-21-04-F-0430 in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: Field Supervisor, Fish and Wildlife Service, Albuquerque NM
Forest Supervisor, Kaibab National Forest, Williams AZ
District Ranger, Tusayan Ranger District, Grand Canyon AZ
Shaula Hedwall, Fish and Wildlife Service, Flagstaff AZ

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix AZ

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TABLES

Table 1. Consultation history for the four ongoing projects.

<i>Date</i>	<i>Event</i>
August 19, 2004	We received a request for a formal conference on the effects of the ongoing Frenchy and Elk-Lee Vegetative Treatment projects, the Dogtown and Clover High Fuels Reduction projects, ongoing personal-use firewood cutting, and wildland fire use (previously known and consulted on as prescribed natural fire) on proposed MSO critical habitat.
September 28, 2004	We responded with a thirty-day letter which included a recommendation to convert the request for a formal conference to a request for formal consultation on designated MSO critical habitat.
October 7, 2004	We received an email message requesting that the formal conference be converted to a formal consultation.
October 25, 2004	We sent an email message with the observation that the Dogtown and Clover High projects were Wildland Urban Interface projects that were exempt from critical habitat considerations per the definitions of the critical habitat final rule. We also recommended including consideration of the effects of the ongoing personal-use firewood cutting on the MSO as a species.
November 5, 2004	We received an email message stating that inclusion of the Dogtown and Clover High projects was not necessary for this consultation. The email message also included a request to include the effects of the ongoing personal-use firewood cutting on the MSO and an addendum to the BE addressing the effects of that project on the species.
December 21, 2004	We issued a draft biological opinion for review
January 21, 2005	We received recommended minor edits from the Forest Service which were incorporated into the biological opinion.

Table 2. Wildland fire use prescriptions within MSO habitat.

<i>MSO Habitat</i>	<i>Intensity</i>	<i>Flame Length Targets</i>	<i>Maximum Ambient Temp</i>	<i>Minimum Ambient Temp</i>	<i>Relative Humidity</i>	<i>Fuel Moistures in 1000-hour fuels</i>
Protected Habitat & Restricted Mixed Conifer	Low	not to exceed 2-3 feet, with occasional torching and concentrated fuel flare-ups	85 degrees Fahrenheit	10 degrees Fahrenheit	20-100%	$\geq 16\%$
Restricted Pine-Oak	low to moderate	not to exceed 4-5 feet, with occasional torching and concentrated fuel flare-ups	90 degrees Fahrenheit	10 degrees Fahrenheit	15-100%	$\geq 12\%$

Table 3. Some recent influential fires within the Upper Gila Mountains Recovery Unit, approximate acres burned, number of PACs affected, and PAC acres burned.

<i>Fire Name</i>	<i>Year</i>	<i>Total Acres Burned</i>	<i># PACs Burned</i>	<i># PAC Acres Burned</i>
Rhett Prescribed Natural Fire	1995	20,938	7	3,698
Pot	1996	5,834	4	1,225
Hochderffer	1996	16,580	1	190
BS Canyon	1998	7,000	13	4,046
Pumpkin	2000	13,158	4	1,486
Rodeo-Chediski	2002	462,384	55	~33,000
TOTAL		525,894	84	~43,645

Table 4. Amount of protected (PACs, steep slopes, wilderness) and restricted (mixed conifer, pine-oak) MSO habitat within the action area for ongoing personal-use firewood cutting.

<i>Habitat</i>	<i>Acres</i>
Protected Activity Centers (PACs)	2,063
Protected Steep Slopes	1,961
Protected Wilderness	6,129
Total Protected Habitat	10,153
Restricted Mixed Conifer	2,270
Restricted Pine-Oak	54,689
Total Restricted Habitat	56,959
Total MSO Habitat	67,112

Table 5. MSO habitat surveyed to protocol within the Williams Ranger District.

<i>Year</i>	<i>Restricted Habitat Surveyed (Acres)</i>	<i>Protected Habitat Surveyed (Acres)</i>
1988-1996	10,815 (various projects)	19,783
1997	667 (Beacon)	1,200 (Bill Williams PAC); other PACs informally monitored
1998	3,167 (Beacon, Elk portion of Elk-Lee)	Informally monitored
1999	2,500 (Elk Portion of Elk-Lee)	0
2000	0	Informally monitored
2001	3,300 (Dogtown, Clover High)	Informally monitored
2002	4,150 (Dogtown, Clover High, Frenchy)	Informally monitored
2003	17,400 (City, Twin)	Informally monitored
2004	17,400 (City, Twin)	Portions of Bill Williams PAC; other PACs informally monitored

Table 6. Amount of MSO critical habitat within the vegetative treatment projects, personal-use firewood cutting, and wildland fire use areas.

<i>Project</i>	<i>MSO Critical Habitat (Acres)</i>
Frenchy Vegetative Treatment Project	2,735
Elk-Lee Vegetative Treatment Project	4,211
Personal Firewood Cutting Areas	56,097
Wildland Fire Use Areas	63,468 (all MSO critical habitat in the south zone)

Table 7. Recent Forest Service projects on the south zone involving MSO and/or MSO critical habitat.

<i>Project</i>	<i>Conclusion</i>
Twin Prescribed Burn 2-21-03-I-145	Some informal consultation on the project has occurred
Pumpkin Fire 2-21-00-F-326	Adverse effects to MSO were addressed in a biological opinion
Morgan Wildland Fire Use 2-21-04-F-432	Adverse effects to MSO were addressed in a biological opinion
Trick Fire 2-21-02-I-454	The Forest Service determined the action would not affect the MSO
Homestead/Davenport Allotment Management Plans 2-21-02-I-545	We concurred that the project was not likely to adversely affect the MSO
Reissuance of Grazing Permit for Davenport, Hat, Moritz Lake, and Spitz Hill allotments 2-21-04-I-241	We concurred that the project was not likely to adversely affect the MSO
Grazing Allotments and MSO Critical Habitat on the Williams Ranger District 2-21-04-I-372	We concurred that the project was not likely to adversely affect MSO critical habitat
Tule Allotment Management Plan 2-21-03-I-368	We concurred that the project was not likely to adversely affect the MSO
Chalender and Sitgreaves Grazing Allotments 2-21-03-I-342	We concurred that the project was not likely to adversely affect the MSO
Herbicide Treatment Along Public Roads on National Forest Lands in Arizona 2-21-02-I-208	We concurred that the project was not likely to adversely affect the MSO
Campground Bark Beetle Outbreak Sanitation and Prevention 2-21-04-I-247	We concurred that the project was not likely to adversely affect the MSO
Bill Williams Mountain Electronic Site 2-21-04-I-165	We concurred that the project was not likely to adversely affect the MSO
Emergency Consultation on Removal of Imminent Danger Trees in APS Powerlines on Kaibab National Forest 2-21-04-I-246	Ongoing
City Project 2-21-03-I-144	Some informal consultation on the project has occurred

Table 8. Summary of effects of the four ongoing projects to primary constituent elements of MSO critical habitat.

<i>Primary Constituent Element</i>	<i>Frenchy and Elk-Lee Vegetative Treatments</i>	<i>Personal-Use Firewood Cutting</i>	<i>Wildland Fire Use</i>
Range of tree species, of different tree sizes, 30-45% of which are large trees with dbh of 12 inches or more	Slight loss of large trees from prescribed fire and conversion of large trees infected with mistletoe to snags	No loss of large trees	Slight loss of large trees from wildland fire
Shade canopy created by the tree branches covering 40% or more of the ground	Reduced canopy closure from vegetative treatments and prescribed fire	No effects to canopy closure	Reduced canopy closure from wildland fire
Large, dead trees (snags) with a dbh of at least 12 inches	Some burning of snags by prescribed fire	Some loss of small snags	Some burning of snags by wildland fire
High volumes fallen trees and other woody debris	Reduced volumes of fallen trees and other woody debris from prescribed fire	Some reduction in volumes of fallen trees and other woody debris from firewood cutting and collection	Reduced volumes of fallen trees and other woody debris from wildland fire
Wide range of tree and plant species, including hardwoods	Plant species richness will increase from prescribed fire and reduced tree densities	No effects to plant species richness	Plant species richness will increase from wildland fire and reduced tree densities
Adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration	Short-term decrease in plant cover from prescribed fire	Very slight and very localized disturbance to plant cover from offroad travel for firewood cutting and collection	Short-term decrease in plant cover from wildland fire