



United States Department of the Interior

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SUMMARY FINAL BIOLOGICAL OPINION ON THE EFFECTS TO THE MEXICAN SPOTTED OWL FROM THE PROPOSAL TO IMPLEMENT THE FIRE MANAGEMENT PLAN GUADALUPE MOUNTAINS NATIONAL PARK, TEXAS

Cons #2-22-03-F-738

Date of the final biological opinion August 4 2005

Action agency Guadalupe Mountains National Park National Park Service

Project The project concerns the proposal to implement the fire management plan within the Guadalupe Mountains National Park Hudspeth and Culberson counties Texas including neighboring land under the jurisdiction of the United States Forest Service Lincoln National Forest, Guadalupe Ranger District, New Mexico The proposed fire management plan will guide all aspects of the Park s fire and fuels management program including fire suppression wildland fire use for a resource benefit, prescribed fire non-fire fuel treatments (e g manual and mechanical thinning), and monitoring

Species affected Mexican spotted owl (*Strix occidentalis lucida*)

Biological Opinion The proposed action is not likely to jeopardize the Mexican spotted owl

Incidental take statement Because of the difficulty in projecting what impacts may occur to the MSO from the proposed action a variety of outcomes are addressed in our incidental take statement We anticipate that one Mexican spotted owl Protected Activity Center will be taken by harm through the life of the project or one Protected Activity Center per year will be harassed

Conservation Recommendations Implementation of conservation recommendations is discretionary Five conservation recommendations are provided



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Memorandum

To Superintendent, Guadalupe Mountains National Park National Park Service Salt Flat Texas

From Field Supervisor USDI Fish and Wildlife Service, New Mexico Ecological Services Field Office Albuquerque New Mexico

Subject Biological Opinion for Guadalupe Mountains National Park s Fire Management Plan

This responds to your January 27 2004, Biological Assessment (BA) for the proposal to implement the Guadalupe Mountains National Park (GMNP) Fire Management Plan, Texas (FMP) (National Park Service 2004a) (BA) The BA evaluates the potential impacts of this project on the Mexican spotted owl (*Strix occidentalis lucida*) (MSO) You have determined that the proposed action may affect is likely to adversely affect the MSO and requested formal consultation No MSO critical habitat is currently designated for this species on Park Service or Forest Service lands within the action area therefore, none will be affected In the BA you determined that the current proposed action will have no effect the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher) the endangered northern aplomado falcon (*Falco femoralis septentrionalis*) and the endangered black-footed ferret (*Mustela nigripes*) (ferret) Because you are not required to consult with us for no effect determinations we are not providing concurrences for these species You also requested concurrence with the following candidate species determinations Black-tailed prairie dog (*Cynomys ludovicianus*) Yellow-billed cuckoo (*Coccyzus americanus*) (cuckoo) and Guadalupe fescue (*Festuca ligulata*)

On August 18 2004 we concluded that the prairie dog is not likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (69 FR 51217) Therefore we no longer consider it to be a candidate species for listing For this reason section 7 consultation is not required for this species

Cuckoos have been documented in 1991 and 1996 at the mouth of McKittrick Canyon Historically the mouth of McKittrick Canyon and other riparian areas that are potential cuckoo habitat are not particularly fire prone due to the presence of plentiful moisture and wide rocky

washes. The Park indicated that treatments will not significantly affect canyon-bottom riparian habitat. For these reasons, we concur with your determination that the proposed action may affect, is not likely to adversely affect, the cuckoo.

Guadalupe fescue has not been documented in the park since a 1952 collection by Hubert Nixon and is thought to be extirpated in the Guadalupe Mountains (National Park Service 2004a). It is considered highly palatable to grazers, and grazing pressure prior to the establishment of the park in 1972 may have led to its disappearance (Desert Botanical Garden 1999 cited in National Park Service 2004a). Currently, the only known population in the United States occurs in the Chisos Mountains of Big Bend National Park. Therefore, we concur with your determination that the proposed action may affect, is not likely to adversely affect, the Guadalupe fescue.

The USDI Fish and Wildlife Service (Service) is committed to fuels reduction projects and fully supports the proposed project to reduce the risk of stand-replacing fires, especially in areas with sensitive resources. Threats of wide-scale habitat loss due to fire are real and immediate on many public lands. Reducing fuels in these areas also may help to protect habitat for threatened and endangered species. For example, the MSO Recovery Plan (Recovery Plan) (USDI Fish and Wildlife Service 1995) recognizes catastrophic wildfire as the greatest threat to the MSO and its habitat. Reduction in habitat and various habitat-based threats contributed to the listing of the MSO. Forest thinning, often in conjunction with prescribed fires, is extremely important as a management tool needed to enhance and often to restore many of the ecosystem functions and processes. The long-term benefits to the MSO of many land management actions may contribute, in the short-term, to certain adverse effects to the MSO. Projects such as the current one fall into this category. Therefore, it is important to address adverse impacts by minimizing to the greatest extent practical those short-term adverse effects and move forward with proactive land management to restore ecosystem functions and community dynamics.

The Recovery Plan encourages fire management programs that have an active role in fuels management (USDI Fish and Wildlife Service 1995). The Recovery Plan also recognizes that catastrophic wildfire is one of the primary threats to the MSO in Basin and Range East Recovery Unit, where the current proposed project is located. Therefore, fire/fuels management programs play a dual role in being potentially beneficial and a threat to the MSO and its habitat. The Service stresses the need to apply adaptive management when conducting fuels management projects. Prescriptions should be structured to maintain key habitat features (e.g., large trees, snags, logs, overstory, and hardwoods) for the MSO and its prey while reducing the risk of catastrophic wildfire. Treatments should produce or maintain such habitat components and must be assessed by a rigorous monitoring program to determine if treatment objectives for the MSO and fuels reduction were met in the short and long-term. Wholesale use of fuels management programs, without understanding or monitoring effects on habitat, may render many of these areas unusable to the MSO and may miss opportunities to improve our knowledge of these programs on habitat.

This document represents our biological opinion (BO) for the MSO in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act).

Consultation History

On October 7, 2003, the Service concurred with a species list that GMNP provided. On January 27, 2004, GMNP submitted a biological assessment and requested formal consultation. The Service subsequently began working on a BO until GMNP informed us that the NEPA document and a preferred alternative had not been drafted. In May 2004, we halted working on the BO, pending the completion of a draft NEPA document. On January 21, 2005, GMNP provided a draft environmental assessment to us with a preferred alternative identified. On June 10, 2005, you sent us the MSO surveys from the last three years and maps of your recently designated MSO protected activity centers (PACs). On June 27, 2005, you submitted a letter identifying yourselves as the lead Federal agency to the proposed action.

This BO is based on information provided in the current BA, the February 3, 2005 FMP environmental assessment (EA), the June 10, 2005 PACs information, email and telephone conversations between our staffs, data in our files, especially from previous informal consultations, data presented in the Recovery Plan (USDI Fish and Wildlife Service 1995) literature review, and other sources of information including the final rules to list the MSO as threatened (USDI Fish and Wildlife Service 1993, 58 FR 14248) and final rule to designate critical habitat (USDI Fish and Wildlife Service 2004, 69 FR 53182). References cited in this BO are not a complete bibliography of all literature available on the MSO, the proposed action or on other subjects considered in this BO. A complete administrative record of this consultation is on file at this office.

DESCRIPTION OF THE PROPOSED ACTION

The proposed FMP will guide all aspects of GMNP's fire and fuels management program including fire suppression, wildland fire use for a resource benefit (WFURB), prescribed fire, non-fire fuel treatments (e.g., manual and mechanical thinning) and monitoring (National Park Service 2005, 2004a). The final FMP will serve as an operations manual and will provide a framework for making fire and fuels management decisions. This document will identify and describe fire and resource management goals and objectives as listed under the Environmental Assessment (National Park Service 2005). When completed, GMNP's FMP will prescribe actions necessary to implement National Park Service fire management policies (DO-18) (National Park Service 2003) and to achieve the Park's resource management goals and objectives (National Park Service 2005). The FMP is currently being drafted and will be finalized shortly after a decision notice is signed for this project. The final FMP will not differ from the proposed action, which is described briefly below. Refer to the BA and EA for more information on the proposed action (National Park Service 2005, 2004a).

The EA lists the following fire management objectives:

1. Protect life and property as the highest priority.
2. Protect park natural and cultural resources from undesirable effects of fire and suppression.
3. Suppress unwanted fire.

- 4 Allow fire to assume its natural role in park ecosystems with justification
- 5 Use wildland and prescribed fire for resource management purposes
- 6 Manage fire cooperatively with neighboring agencies and private land owners as well as other stakeholders and
- 7 Coordinate fire activities with all park divisions and the public

The FMP is a strategic plan that defines the program to manage WFURB prescribed fires wildfire suppression, and other fuels management activities. The FMP is supplemented by operational plans such as preparedness plans preplanned dispatch plans prescribed fire plans and prevention plans. Prescriptions will be included within the individual fire plan or have been predetermined and documented through a programmatic FMP. These prescriptions are measurable criteria that define conditions under which a prescribed fire may be ignited guide selection of appropriate management responses and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic administrative social or legal considerations and incorporate the risk management process (National Park Service 1999)

The proposed FMP defines two fire management units (FMU). The first FMU surrounds the visitor center area and the facilities and residences south of the highway and around the developments at Dog Canyon (National Park Service 2005). This FMU applies full suppression and prescribed burning. The rest of the park comprises the second FMU with protection and suppression emphasis for special features such as historic properties McKittrick Canyon and habitats of threatened and endangered species. Within the second FMU WFURB prescribed fire, fire suppression and non-fuel treatments are proposed. WFURBs would be permitted to burn within FMU 2 under specific environmental conditions with adequate personnel and support available to achieve defined objectives. Both prescribed fires and WFURB would be monitored by a systematic process of collecting and recording data on safety conditions, vegetation topography weather, air quality fire behavior and effects. This information would then be used to determine if the fire is within prescription and if fire and resource management goals and objectives are being met.

FMU 2 also extends beyond the north boundary of the Park to include about 2 000 acres of the McKittrick Canyon watershed that lie on Forest Service land (National Park Service 2005). The Park intends to cooperate with the Forest Service on prescribed fire WFURB fire effects monitoring as well as appropriate management response activities. The area proposed for joint fire activities on Forest Service lands has been called the Zone of Cooperation (ZOC). As outlined in the Lincoln National Forest Land and Resource Management Plan the ZOC lies in the southwest corner of the South Guadalupe Management Area (3A) also designated as the Guadalupe Escarpment Wilderness Study Area (USDA Forest Service 1986) and is managed as wilderness. Timber harvesting mineral extraction and oil and gas leasing are excluded activities. The inclusion of Forest Service lands makes the management of fire safer cheaper and more likely to mimic natural patterns. This cooperative plan is a step toward multi-agency/owner fire management for the entire Guadalupe Mountains landscape sometime in the future. Still fires will usually be suppressed along portions of the Park boundary adjacent to private property.

The EA contains a multi-year fuels plan and timeline for conducting fuels management throughout approximately 35 percent (31,000 acres) of the Park. The proposed treatments are scheduled every year from 2005 until 2015 within 16 project boundaries (National Park Service 2005). The Park Service has reviewed climate and fuel moisture data and determined that some of the prescribed burns may occur during the MSO breeding season, because this period minimizes the possibility of a prescribed burn stand-replacing fire.

WFURB are any non-structure fire, other than prescribed fire and unwanted human caused that occurs in the wildland. WFURB describes the management of naturally ignited (e.g. lightning) fires to accomplish specific pre-stated resource management objectives within a predefined geographic area. Prescribed fire is any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels, habitat improvement, or other resource objectives. Prescribed fire also includes pile burning where vegetation is cut and removed to a location where it is burned. A written approved fire plan must exist prior to ignition of prescribed fires. This document provides the prescribed fire burn boss information needed to implement an individual prescribed fire project.

The Park Service will develop fire prescriptions in the FMP which will be carried through in project-specific burn plans as they are designed and implemented. Prescribed and WFURB prescriptions will include measurable criteria that define conditions under which a fire may be ignited or allowed to burn, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social or legal considerations, and incorporate the risk management process (National Park Service 1999). Both WFURB and prescribed fires are closely monitored to meet the defined resource or prescription objectives. Prescriptions for subsequent burns will be modified based on previously monitored results and desired outcomes.

The National Park Service has mandatory elements for each prescribed fire project plan including pre-burn considerations such as specifying precautions and treatments to protect endangered species (National Park Service 1999, 2003, 2003a). The National Park Service will also develop a Wildland Fire Implementation Plan that is an assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a WFURB. For each fire, there will also be a Wildland Fire Situation Analysis, which is a decision-making process that evaluates alternative suppression strategies against selected environmental, social, political, and economic criteria. This analysis provides a record of decisions. The Park informed us that they will use a systematic decision making process to determine the most appropriate management strategy for all unplanned ignitions (i.e. WFURB) and for any prescribed fires that are no longer meeting resource or prescription objectives. The National Park Service wildfire management planning and implementation process described in Directors Order #18 and Reference Manual-18 will be followed and are hereby incorporated by reference (National Park Service 1999, 2003).

The proposed FMP will also include actions that relate to suppression of wildfires. Suppression

involves extinguishing a fire that is burning outside of prescription parameters (e.g. rate of spread is too high) is not meeting fire and resource objectives, or is in a location designated as a suppression zone or may pose an immediate threat to life or property GMNP indicated in the EA that all human caused fires will be suppressed

Tactics for suppression are varied and depend on the particular situation (e.g. location, weather, safety considerations, etc.) associated with each fire. For example, suppression actions can include hand crews cutting a line around the fire perimeter to remove live and dead vegetation, water and retardant drops from aircraft, manual and mechanical thinning, burn out situations in which fire is used to remove live and dead vegetation in an effort to stop the fire, and cold trailing in areas of low fuel loads where crews physically feel the ground and put out hot spots. The EA identified that the Park will manage suppression in ways that minimize unnecessary impacts to resources (i.e. Minimum Impact Suppression Tactics) (MIST) (National Park Service 1999, 2003, 2004). MIST strives to minimize landscape alteration and disturbance to natural and cultural resources while safeguarding human lives and accomplishing resource-related objectives. Under the current proposal, the National Park Service has incorporated conservation measures and will use MIST to minimize or avoid impacts to the MSO and its habitat (see Conservation Measures section below).

In the past, the NPS has coordinated with the Service and, when appropriate, initiated emergency section 7 consultations for suppression activities when they may affect federally listed species. Under the current proposal, the NPS has incorporated conservation measures and MIST to minimize or avoid impacts to the MSO and its habitat (see conservation measures section below and MIST in the EA and BA). The Act's section 7 regulations provide for emergency consultations during "situations involving acts of God, disasters, casualties, national defense or security emergencies, etc." (50 CFR 402.05). Our primary objective during any emergency situation is to provide conservation recommendations for minimizing adverse effects to listed species without impeding response efforts. Protecting human life and property should come first every time. Consequently, no constraints for protection of listed species or their critical habitat will be recommended if they place human lives or structures in danger. GMNP will coordinate with the Service regarding any wildfire suppression activities that affect the MSO. Through this coordination, we anticipate that conservation recommendations will be continually adapting as their effectiveness for minimizing impacts to the MSO and its habitat are evaluated.

Additionally, decision criteria (also called a Go/No-Go Run Sheet) will be used to evaluate whether a wildfire will be suppressed or allowed to burn as a WFURB. Table II-2 in the EA identifies decision criteria that have been used in the past. The Park is proposing a new set of decision criteria (Table II-3) that may result in more WFURB. Under the proposed action, fire use managers will also be available to oversee WFURB at GMNP whenever needed. Historically, administrative considerations have tended to be the cause of decisions to suppress wildland fire and not allow a natural ignition to burn. For example, during fire season, resource (fire crews and equipment) availability can frequently be a problem. Needed personnel to manage wildland fire use, particularly fire use managers, may not be available. Therefore, the proposed FMP also includes actions that relate to suppression of wildfires. The Park also intends

to use non-fire treatments to reduce fuels around significant natural resources unique sites, and cultural resources especially flammable historic structures

Non-fire fuel treatments

These treatments include manual and mechanical thinning that removes live and dead vegetation to manage hazardous fuels. Descriptions of these actions are further detailed in the EA (National Park Service 2005). Non-fire fuel treatments will be designed to remove smaller diameter trees ladder fuels shrubs, snags and ground litter. GMNP indicated that vegetation treatments will follow the guidance of the Recovery Plan for protected or restricted habitat. For example naturally occurring large dead and down logs (greater than 12 diameter at breast height (dbh)) will be retained and mortality of trees 18 inches dbh and larger will be avoided within restricted habitat. Additionally the Park will limit treatments to 9 inches dbh within PACs.

The Park will also monitor all fires. Monitoring will involve the systematic collection and recording of data on fuels topography weather air quality and fire behavior. The Park will continuously update information on fire size location, behavior, smoke dispersal safety conditions and effects. WFURB and prescribed fires will also be monitored in order to evaluate whether resource and fire management objectives are met or if a fire exceeds prescription and should be suppressed.

Fire monitoring plans are a required element of National Park Service's fire use program (National Park Service 1999 2003 2003a). The BA included a general discussion on monitoring as described above, but did not include a detailed fire monitoring plan. Nevertheless National Park Service has developed a fire monitoring handbook which contains standardized protocols for monitoring and documenting fire behavior and affects http://www.nps.gov/fire/fire/fir_eco_firemonitoring.html. The handbook provides a system to document burning conditions and fire behavior insure that fires remain within set conditions verify completion of burn objectives and follow long-term trends. The Park will follow the National Park Service program requirements that provide the following four levels of monitoring 1) environmental planning 2) fire observations, 3) immediate post-fire effects, and 4) long-term change (National Park Service 1999 2003 2003a).

Despite the best intentions actions related to the suppression or management of fire may create the need for short-term or long-term rehabilitation. The Park will use National Park Service fire and resource management staff to determine short- and long-term needs and to write implement and monitor emergency stabilization plans as necessary for each fire. The National Park Service will follow Directors Order #18 Reference Manual-18, and the Department of Interior's burned area emergency rehabilitation handbook (National Park Service 1999 2003). Rehabilitation efforts may include actions such as flush cutting stumps, restoring campsites to natural conditions removing all trash and where appropriate, installing erosion control devices planting in burned areas and falling hazardous trees. GMNP informed us that coordination with the Service regarding rehabilitation activities within MSO habitat will occur as appropriate.

Conservation Measures

The following were identified in the BA as part of the proposed action. These conservation measures were evaluated below as part of our jeopardy analysis. They are intended to minimize or avoid adverse impacts associated with the MSO and its habitat. Therefore, these actions are non-discretionary, and must be undertaken by the National Park Service because they are part of the proposed action. If they are not fully implemented, the Service should be contacted to determine if reinitiation of formal consultation is required (50 CFR 402.16). The BA indicates that as part of the proposed action the following conservation measures for the MSO will be implemented:

1. The park will identify MSO PACs, prioritize areas for protection, and locate access points for suppression, wildland fire use, and prescribed burning activities. This information will be communicated in advance (when feasible) to fire management personnel. The Park has designated 11 PACs following the general recommendations in the Recovery Plan (USDI Fish and Wildlife Service 1995a).
2. Guadalupe Mountains National Park is a Class I airshed, and smoke will be managed to prevent air quality degradation according to state and local requirements. Both volume and density of smoke is usually greater for wildfires than for prescribed burns or wildland fire use, smoke dispersal is a factor in the decision for wildland fire use (National Park Service 2005, Table II-3, Appendix B, Table 1).
3. If aircraft flights over occupied protected activity centers (PACs) during the breeding season (March 1 through August 31) are needed during fire operations, Guadalupe Mountains National Park will maintain a vertical separation of at least 500 feet above ground level (AGL) over ridges and 2,000 feet AGL over canyon bottom MSO habitat. Aircraft overflights will likely only be used during emergency life-threatening situations, when it is tactically necessary, or when human structures are in danger.
4. All vegetative manipulations in MSO habitat will follow guidelines in the MSO recovery plan.
5. By conducting low-intensity prescribed fires and managing naturally ignited fires to meet the low heat objectives in the burn plan (including fitting appropriate fire prescriptions), Guadalupe Mountains National Park will minimize heat effects to MSO.
6. Resource advisors with knowledge of MSOs must be onsite during burning operations and will participate in decisions relating to escaped prescribed fire and suppression actions.
7. Prescribed burns in woodland habitat will be limited to the cooler spring and fall seasons when fires can reduce fuels without jeopardizing the majority of the overstory.

- 8 Additional minimization measures will be taken if wildfire enters a PAC including, but not limited to a) minimal line building b) restricted aircraft overflights, c) restricted retardant drops on the perimeter and within the PAC, and d) thorough rehabilitation of any suppression actions occurring within and immediately adjacent to the PACs
- 9 Prescribed fires that could potentially enter 100-acre core areas will generally occur during the MSO non-breeding season (September through February) However, there may be occasions with GMNP determines that a prescribed is appropriate during the MSO breeding season In these years, the National Park Service will conduct MSO surveys prior to the prescribed fire Surveys would generally cover MSO PACs within 600 m of the planned fire If MSOs are not present or are not reproducing, the prescribed fire will proceed as appropriate

As described in the Environmental Baseline section below, GMNP conducted surveys for MSO during 1999, 2000, 2003 2004 and 2005 All potential MSO habitat within GMNP has been surveyed The Park will continue to conduct MSO surveys and monitoring as appropriate For example the Park intends to continue baseline monitoring for the MSO on a 3 to 5 year schedule (i.e., MSO habitat would be surveyed every 3 to 5 years) This would also be consistent with the Park Service's fire monitoring program requirements and their wildfire management planning and implementation process detailed above (National Park Service 1999 2003) When these measures are implemented documentation and reporting will also occur

STATUS OF THE SPECIES (range-wide)

Mexican spotted owl

a Species/critical habitat description

The MSO was listed as threatened on March 16 1993 (USDI Fish and Wildlife Service 1993) The Service was ordered to re-propose critical habitat by April 13 2004 the final rule on MSO critical habitat was published on August 30 2004 (USDI Fish and Wildlife Service 2004)

The American Ornithologist's Union recognizes three spotted owl subspecies California spotted owl (*S. o. occidentalis*) Mexican spotted owl (*S. o. lucida*) and northern spotted owl (*S. o. caurina*) The MSO is distinguished from the California and northern subspecies by plumage genetic makeup, and geographic distribution This owl is mottled in appearance with irregular white and brown spots on its abdomen back and head Its white spots are larger and more numerous than in other subspecies giving it a lighter appearance Several thin white bands mark its brown tail Unlike most other owls all spotted owls have dark eyes

S. o. lucida has the largest geographic range of the three subspecies Its range extends from Aguascalientes Mexico through the mountains of Arizona New Mexico and western Texas the canyons of southern Utah and the Front Range of central Colorado The MSO's distribution is fragmented throughout its range corresponding to forested mountains and rocky canyon lands

(USDI Fish and Wildlife Service 1995, Tarango et al 1997 Young et al 1997 Sureda and Morrison 1998, Gutierrez et al 1995 Peery et al 1999 Sorrentino and Ward 2003)

b Life history

The MSO occupies a broad geographical area, but does not occur uniformly throughout its range (USDI Fish and Wildlife Service 1995). Instead, the MSO occurs in disjunct localities that correspond to isolated mountain systems and canyons. The MSO is frequently associated with mature mixed-conifer, pine-oak, and riparian forests (Ganey et al 1988, Skaggs and Raitt 1988, Ganey and Balda 1989, Gutierrez and Rinkevich 1991, Willey 1993 Fletcher and Hollis 1994, Ganey and Dick 1995 Gutierrez et al 1995, Seamans and Gutierrez 1995, Ward et al 1995). Mature mixed-conifer forests are mostly composed of Douglas-fir (*Psuedotsuga menziesii*) white fir (*Abies concolor*) limber pine (*Pinus flexilis*) or blue spruce (*Picea pungens*). Pine-oak forests are mostly composed of ponderosa pine (*Pinus ponderosa*) and Gambel oak (*Quercus gambellii*). Riparian forests are dominated by various species of broadleaved deciduous trees and shrubs (USDI Fish and Wildlife Service 1995). Riparian forests function as important components of ecosystems supporting MSOs. These communities, particularly mature multilayered forests, can be important linkages between otherwise isolated subpopulations of MSOs (USDI Fish and Wildlife Service 1995). They may serve as direct avenues of movement between mountain ranges or as stopover sites and connect large expanses of landscape that otherwise would be inhospitable to dispersing MSOs. Historical evidence shows that MSOs once nested in riparian habitats (USDI Fish and Wildlife Service 1995).

MSOs breed sporadically and do not nest every year (Gutierrez et al 1995). Calling activity increases from March through May (although nesting females are largely silent during April and early May), and then declines from June through November (Gutierrez et al 1995). MSOs are usually silent from December through February (Gutierrez et al 1995). Courtship begins in March with pairs roosting together during the day and calling to each other at dusk (Ganey 1988). Eggs are laid in late March or early April (Delaney et al 1999). The incubation is approximately 30 days and performed entirely by the female (Ganey 1988 Forsman et al 1984). Foraging is entirely by males during incubation and the first half of the brooding period. Females leave the nest only to defecate, regurgitate pellets, or receive prey from their mate (Forsman et al 1984 Ganey 1988).

MSOs are highly selective for roosting and nesting habitat, but forage in a wider array of habitats (USDI Fish and Wildlife Service 1995 Ganey and Balda 1994, Seamans and Gutierrez 1995). Roosting and nesting habitat exhibit certain identifiable features, including large trees with trunk diameters greater than 12 inches (in) (30.5 centimeters [cm]), high tree basal area, uneven-aged tree stands, multi-storied canopy, moderate to high canopy closure, and decadence in the form of downed logs and snags (Ganey and Balda 1989 Ganey and Dick 1995 Grubb et al 1997 Tarango et al 1997 Peery et al 1999 Ganey et al 2000 Geo-Marine 2004). Canopy closure is typically greater than 40 percent (Ganey and Balda 1989 Fletcher 1990 Zwank et al 1994 Grubb et al 1997 Tanrango et al 1997 Ganey et al 1998 Young et al 1998 Ganey et al 2000 Geo-Marine 2004).

All nests reported by Zwank et al (1994) Seamans and Gutierrez (1995) and Geo-Marine (2004) were in mixed-conifer or Douglas-fir habitat. Roost and nest trees were the oldest and largest within tree stands (Ganey and Balda 1989, 1994; Seamans and Gutierrez 1995). MSOs use areas that contain a number of large trees of different types including mixed-conifer and pine-oak with smaller trees under the canopy of the larger trees. These types of areas provide vertical structure and high plant species richness that are important to MSOs (Ganey and Dick 1995, Seamans and Gutierrez 1995; Ganey et al 2003). Tarango et al (1994) and Ganey et al (2000) recorded seven or more tree species at roost sites. Therefore, mixed-conifer dominated by Douglas-fir, pine-oak and riparian forests with high tree diversity are important to the MSO. Juvenile MSOs disperse from their natal territories in September and October, into a variety of habitats ranging from high-elevation forests to pinon-juniper woodlands and riparian areas surrounded by desert grasslands (Gutierrez et al 1995, Arsenault et al 1997, Willey and c Van Riper 2000). Observations of long-distance juvenile dispersal provide evidence that they use widely spaced islands of suitable habitat which are connected at lower elevations by pinon-juniper and riparian forests. MSOs have been observed moving across open low desert landscapes between islands of suitable breeding habitat (Arsenault et al 1997, Ganey et al 1998; Willey 1998). MSO movements were also observed between sky island mountain ranges in New Mexico (Gutierrez et al 1996). As a result of these movement patterns isolated populations may have genetic significance to the MSO's conservation (Keitt et al 1995; Gutierrez and Harrison 1996; Seamans et al 1999; Willey and c Van Riper 2000). Therefore, contiguous stands or islands of suitable mixed-conifer, pine-oak, and riparian forests are important to the MSO.

MSO foraging habitat includes a wide variety of forest conditions: canyon bottoms, cliff faces, tops of canyon rims, and riparian areas (Gutierrez and Rinkevich 1991; Willey 1993). Ganey and Balda (1994) reported that MSOs foraged more frequently in unlogged forests containing uneven-aged stands of Douglas-fir and white fir with a strong component of ponderosa pine than in managed forests.

The primary MSO prey species are woodrats (*Neotoma* spp.), peromyscid mice (*Peromyscus* spp.), and microtine voles (*Microtus* spp.) (USDI Fish and Wildlife Service 1995; Young et al 1997; Delaney et al 1999; Seamans and Gutierrez 1999). Mexican woodrats (*N. mexicana*) are typically found in areas with considerable shrub or understory tree cover and high log volumes or rocky outcrops associated with pinon-juniper woodlands (Sureda and Morrison 1998; Ward 2001). Sureda and Morrison (1998) and Ward (2001) found deer mice (*P. maniculatus*) to be more abundant and widespread in the 60 to 100 year old stands of mixed-conifer forests. Mexican voles (*M. mexicanus*) are associated with mountain meadows and high herbaceous cover, primarily grasses, whereas long-tailed voles (*M. longicaudus*) are found in dry forest habitats with dense herbaceous cover, primarily forbs, many shrubs, and limited tree cover (Ward 2001). High levels of MSO reproductive success and production may be due to prey abundance (Delaney et al 1999). Ward and Block (1995) documented an increase in MSO production when moderate to high levels of woodrats, peromyscid mice, and voles were consumed. A diverse prey base is dependant on availability and quality of diverse habitats. MSO prey species need adequate levels of residual plant cover, understory cover, and high log

volume. Therefore, a wide variety of forest and vegetative conditions are important to the MSO and its prey.

c. Population dynamics

Historic population size estimates and range of the MSO are not known however, present population size and distribution are thought to be similar (USDI Fish and Wildlife Service 1995). Ninety-one percent of known MSOs existing in the United States between 1990 and 1993 occurred on land administered by the Forest Service (USDI Fish and Wildlife Service 1995). Most MSOs have been found within the 11 National Forests of Arizona and New Mexico. It is unknown why Colorado and Utah support fewer MSOs. In 2002, Forest Service reported 987 PACs in Arizona and New Mexico (USDA Forest Service 2002). Additional surveys are likely to document more MSOs on Forest Service and other lands. For example, Geo-Marine (2004) reported an additional 26 activity centers not previously designated by the Gila National Forest. Current information suggests there are 11 PACs in Texas, 15 PACs in Colorado, 105 PACs in Utah, and 43 PACs on NPS lands in Arizona, therefore 1,187 PACs have been identified. Based on this number of MSO sites, we believe that the total known MSO numbers on Federal lands in southwestern United States range from 1,187 or 2,352 depending on whether one bird or a pair occupies the PAC. Seamans et al. (1999) reported evidence of 10 percent or greater population declines in central Arizona and west-central New Mexico. Both populations experienced lower survival rates in the late 1990s. Gutierrez et al. (2003) concluded that with four additional years of data on these same populations, the decline observed by Seamans et al. (1999) on the Arizona study area was temporary, whereas the decline in New Mexico appeared to be continuing. Wide population fluctuations may be common for populations of MSOs (Gutierrez et al. 2003).

The Upper Gila Mountain Recovery Unit (RU) has the largest known percent of MSO PACs (63 percent) followed by the Basin and Range-West (16 percent), Basin and Range-East (14 percent), Southern Rocky Mountain-New Mexico (5 percent) and Colorado Plateau (2 percent) (USDA Forest Service 2002). Reports of PAC occupancy range from 68 to 79 percent in the Lincoln and Gila National Forests, respectively (Geo-Marine 2003, Sorrentino and Ward 2003, Ward et al. 2003).

d. Status and distribution

Two primary reasons were cited for listing the MSO as threatened in 1993: 1) Historical alteration of its habitat as the result of timber management practices, specifically the use of even-aged silviculture, and the threat of these practices continuing; and 2) the danger of catastrophic wildfire. Another factor that contributed to declines included the lack of adequate existing regulatory mechanisms. The Recovery Plan also notes that forest management has created habitats favored by great horned owls, increasing the likelihood of predation. Other threats identified in the Recovery Plan include the potential for increasing malicious and accidental anthropogenic harm (e.g., shooting and vehicle collisions), and for the barred owl to expand its range, resulting in competition or hybridization with the MSO. The Recovery Plan outlines management actions that guide land management agencies in efforts to remove recognized

threats and recover the MSO

Bond et al (2002) described short-term effects of wildfires on MSOs throughout the species range. The authors reported that relatively large wildfires that burned nest and roost areas appeared to have little short-term (1-year) effect on survival, site fidelity, mate fidelity, and reproductive success of MSOs, as rates were similar to estimates independent of fire. However, Elliot (1995), MacCracken et al (1996) and Gaines et al (1997) reported in some cases, large stand-replacing wildfires appeared to have a negative effect on MSOs. Jenness (2000) reported low- to moderate-severity fires did not adversely affect MSOs. Bond et al (2002) hypothesized that MSOs may withstand the immediate short-term effects of fire occurring at primarily low- to moderate-severities within their territory. The Forest Service reported similar results following the 2002 Lakes Fire in the Jemez Mountains of north-central New Mexico (USDA Forest Service 2003). Danney Salas (USDA Forest Service pers comm 2003) reported that of the 10 PACs that are monitored within the footprint of the Scott Able Fire, MSOs were detected in 9 of them. He also reported that the same number of MSO pairs before and after the Bridge Fire were detected and reproduced within the burn area. He also indicated that there were two MSO nest areas found in areas where fire retardant was used during suppression activities. Given historical fire regimes within its range, the MSO may be adapted to survive wildfires of various size and severities. Therefore, prescribed burning and other forest management activities could be an effective tool to reduce fire risk and restore forests to natural conditions with short-term impacts to MSOs. For example, prescribed fire may prove useful in the creation or maintenance of habitat for MSOs or their prey (Gutierrez et al 2003). Bond et al (2002) cautioned that programmatic prescribed burning in MSO territories could not be justified solely on their observations. Manipulative experiments are needed to evaluate effects of fire (or other forest management activities) on MSOs (Bond et al 2002).

Geo-Marine, Inc (2003) results suggest that MSOs avoid areas with aircraft noise and were found in areas with low aircraft noise. Johnson and Reynolds (2002) and Geo-Marine, Inc (2003) reported that MSOs did not flush from their roost or nest as a response to aircraft noise. Delaney et al (1999) found that MSOs did not flush when noise stimuli from helicopters and chainsaws were greater than 115 yards (yd) (105 meters [m]) away. Chainsaws were more disturbing to MSOs than helicopter flights at comparable distances (Delaney et al 1999). Delaney et al (1999) recommended a 115-yd buffer for helicopter overflights to minimize MSO flushing responses and any potential effects on nesting activity. Other recommendations were diurnal flights and separating overflights along the same path by seven days (Delaney et al 1999).

Since the owl was listed, we have completed or have in draft form a total of 152 formal consultations for the MSO. These formal consultations have identified incidences of anticipated incidental take of MSO in 337 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 one of these projects (release of site-specific MSO location information) has resulted in a BO that the proposed action would likely jeopardize the continued existence of the MSO.

In 1996, the Service issued a BO on Forest Service Region 3's adoption of the Recovery Plan recommendations through an amendment of their Forest Plans. In this non-jeopardy BO, we anticipated that approximately 151 PACs would be affected by activities that would result in incidental take of MSOs, with approximately 2 of those PACs located in the Southern Rocky Mountain-New Mexico RU. In addition, we completed a reinitiation of the 1996 Forest Plan Amendments BO 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 have resulted in 233 PACs adversely affected, with 5 of those in the Southern Rocky Mountain-New Mexico RU. Region 3 of the Forest Service reinitiated consultation on the Forest Plans on April 8, 2004.

ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the effects of the action on federally listed species, we are required to take into consideration the environmental baseline. Regulations implementing the Act (50 FR 402 02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area; the anticipated impacts of all proposed Federal actions in the action area that have undergone section 7 consultation; and the impacts of State and private actions that are contemporaneous with the consultation in progress. 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. We have defined the action area as GMNP and adjacent lands. Thus, the action area includes MSO habitat outside the boundary of the Park that has the potential to be affected from prescribed burns, WFURB, or suppression activities from fires that ignite within the Park and move out. The EA specifically discusses this relationship between the Park's activities and adjacent Forest Service lands (National Park Service 2005).

STATUS OF THE SPECIES (within the Action Area)

Mexican spotted owl

The GMNP and Guadalupe Ranger District is within the Basin and Range East RU. The Basin and Range East RU contains the second highest concentration of known MSO sites (16 percent) in the United States. Because of the high concentration of MSOs, the Basin and Range East RU has been referred to as an important MSO distribution center in the Recovery Plan. This subspecies occurs in isolated mountain ranges scattered across the Basin and Range East RU, but the largest portion of the MSO subpopulation occurs in the Sacramento Mountains. MSOs are

most common in mixed-conifer forest but have been located in ponderosa pine forest and piñon/juniper woodland on a few occasions (Skaggs and Raitt 1988). This subspecies has been reported on National Forest lands in the Sandia, Manzano, Sacramento, and Guadalupe Mountains, as well as the GMNP and on Mescalero Apache Nation lands (Service 1995a).

Five years of surveying in GMNP (National Park Service 1999, 2000, 2003, 2004, 2005) confirm the MSOs in the Guadalupe Mountains have habitat-specific preferences. The MSOs in GMNP were consistently found in canyon habitat associated with north-facing slopes with large cliffs or cavities nearby. Cliffs and cavities are used for nests, as opposed to mature, decadent conifers. Large deciduous trees of bigtooth maple (*Acer grandidentatum*), chinquapin oak (*Quercus muehlenbergii*), and western hophornbeam (*Ostrya knowltonii*) in canyon bottoms or toward bases of slopes near the nesting areas are used for day roosting or hunting perches. All MSOs were found within an elevation band of 5,300 – 6,800 feet (Kauffman unpublished data 2003 to 2005). Analysis of egested pellets (n=29) show that *Neotoma* sp. are heavily relied upon for food (Harris unpublished report 2005).

The range-wide population of the MSO is naturally fragmented into geographically distinct subpopulations. Because of its size and location, the Basin and Range East RU likely plays a very important role in the metapopulation dynamics of the MSO in the southwest (Stacey 2000). However, other authors believe that the MSO population in the Sacramento Mountains likely contributes very little to other subpopulations (e.g., Ward 2001). Nevertheless, dispersal is the mechanism that connects subpopulations and the larger metapopulation (e.g., see Gutierrez *et al.* 1996, Ganey *et al.* 1998). Adult and subadult MSOs are relatively sedentary, however, juveniles almost always disperse from their natal sites (Service 1995a and references therein). Consequently, the key to maintaining connectivity between distinct subpopulations appears to be reproduction (i.e., the production of juveniles that are likely to disperse). It is likely that weather, habitat condition, the MSO's population structure, and prey availability all interact to influence variation in the MSO's reproductive performance (Ward 2001).

MSOs occurring in the Guadalupe Mountains have been exposed to various disturbances for more than a century. Disturbances include forest fires and human disturbances, including timber and fuelwood harvest, grazing, land development, and recreation. According to the Recovery Plan, the greatest threats in the Basin and Range East RU, in order of potential effects, are catastrophic fire, timber harvest, fuelwood harvest, grazing, human developments, and forest insects and disease. Other activities that are considered potential threats to the MSO include certain military operations, other habitat alterations (such as powerlines and roads), mining, and recreation. Recovery in this unit will require management and maintenance of existing and future populations by managing and conserving habitats in areas not only inhabited by MSOs, but also in unoccupied suitable or potentially suitable habitats (Service 1995a).

Fire studies at Guadalupe Mountains National Park and elsewhere in the Guadalupe Mountains suggest fire may have been a regular event prior to the 20th century. Small fires burned in mixed coniferous forest in the Guadalupe Mountains on average every 17 years from 1554-1842 (Ahlstrand 1981). A fire history project of the forested area of the park was initiated in 2003. From the late

1800s through 1922, fires occurred on average every 30 years. Fire scars from 1808, 1830, 1842, 1857, and 1879 indicate that on average these low intensity fires burned about 1,300 acres. This decline in frequency closely parallels the development of ranching in the area and subsequent reduction of fine fuels (National Park Service 2005). Other than stand-replacing fires of 1990 and 1994, no large wildfire has burned in the Park since 1922 (Taylor and Sakulich, 2003 in progress).

Managers at the park recognized the effects of fire exclusion and fire suppression in the early 1970s. With the approval of the 1985 full-spectrum fire management plan which allowed fire as a management tool, the park began directly and indirectly allowing fire to assume its role as one of the natural processes maintaining park ecosystems. The Park also recognized that carefully placed fires could reduce fuels built up around valuable cultural and natural resources and help protect them from destructive wildfires. Since 1979 the park has carried out 40 prescribed burns covering roughly 7600 acres.

Other past and present projects that may contribute to the environmental baseline are within this RU are the Forest Service's Programmatic Wildland Urban Interface project (Service 2001c), the Forest Service's Rio Penasco II vegetation management project (Service 2002), and the historic and ongoing grazing within Forest Service grazing allotments. Other activities within the action area that add to the effects on the MSOs include trees damaged or killed from beetle and mistletoe infestations, aircraft overflights, and recreational impacts.

Fire studies at Guadalupe Mountains National Park and elsewhere in the Guadalupe Mountains suggest fire may have been a regular event prior to the 20th century. Small fires burned in mixed coniferous forest in the Guadalupe on average every 5 years from 1554-1842 (Ahlstrand 1981). Fire scar analysis also showed these wildland fires to be low-intensity surface fires that rarely damaged the overstory trees under which they burned (Stubbs 2004).

Today, after more than 80 years of active fire suppression, GMNP's ecosystems are experiencing high accumulations of litter, duff, and dead and down woody fuels, increased tree densities, low herbaceous cover, decreased availability of soil nutrients, decreased plant productivity, increases in disease, insect infestations, and mortality in trees, loss of habitat, and increases in large stand-replacing fires. Large catastrophic fires like the 1974 Cottonwood Fire (15,000 acres), the 1976 X-Bar fire (12,000 acres), the 1990 Big Fire (33,000 acres), the 1990 Frijole Fire (6,000 acres), the 1993 Pine Fire (6,500 acres), and the 1994 Marcus Fire (6,300 acres) are becoming more frequent within the action area (Stubbs 2004, F. Armstrong, National Park Service pers. comm., 2005).

In addition, subtle but important hydrological changes may be occurring because of increased forest growth. Decreased runoff and infiltration may be altering the water table around meadows, helping to accelerate tree invasions (National Park Service 2004a). The combination of high tree densities and increased forest fuels also increases the potential for insect and pathogen infestations, which may cause tree die-off and further increase the potential for fire. In the event of catastrophic fire, entire forest landscapes can be denuded and reverted to shrub

communities, watershed and soil processes can be compromised, and other ecosystem values can be greatly altered (National Park Service 2004)

Fire managers have also embraced the idea of letting naturally ignited fires burn if they meet predetermined conditions and are predicted to fulfill park objectives. Such situations are now called wildland fire use. A candidate ignition must meet both environmental and administrative requirements to avoid suppression. Managers exercise extreme caution when deciding not to suppress fires. Very little territory has actually burned under wildland fire use at Guadalupe Mountains. Since 1974, 22 lightning ignitions have met the criteria for wildland fire use, burning approximately 35 acres in all. No potentially large fire has been allowed to burn under wildland fire use.

Observations collected over the last 30 years indicate that MSOs within the action area inhabit steep-walled canyon and mature forested areas within the park and adjacent Forest Service lands (National Park Service 1990, 1990a, USDI Fish and Wildlife Service 1992, Patton 2004). MSO surveys have been conducted within GMNP in 1999, 2000, 2003, 2004, and 2005. Surveys were conducted within montane canyons and forested north-facing slopes. MSOs were recorded from a variety of locations. GMNP recently designated 11 PACs. PACs average 615 acres, with a total of 6,767 acres identified in the 11 PACs.

Within GMNP, the National Park Service also used a geographic information system to model areas where MSOs are likely. These areas include suitable nest sites and associated roost groves. In the BA, the National Park Service termed these areas as predicted MSO habitat. They include known historic MSO nest and regular roost areas, plus other areas that are known to have similar habitat characteristics, including cliff areas and forest stands that exhibit similar characteristics that MSOs use for nesting and roosting. It is likely that predicted MSO habitat also contains some habitat that is not capable of becoming nesting or roosting habitat. These modeled areas outside of PACs are considered restricted habitat, as described in the Recovery Plan (USDI Fish and Wildlife Service 1995). In the BA, the Park Service proposed to generally follow the Recovery Plan, including conducting MSO surveys, designating PACs, and defining 100-acre core areas prior to igniting prescribed fires. As noted, the Park completed MSO surveys during the last three years, and has designated both PACs and the 100-acre core areas.

Currently, there are a total of 134 MSO PACs on the Lincoln National Forest. The majority of these, 109 PACs, are on the Sacramento Ranger District. Smokey Bear, and Guadalupe Ranger Districts share the remaining 25. Since 1994, the Guadalupe Mountains Ranger District has conducted numerous surveys throughout the potential MSO habitat on the southern end of the District (Forest Service 2003a, 2004). They have designated 10 PACs on the District. There is one PAC within North McKittrick Canyon on the Guadalupe Ranger District, and an additional nine PACs spread among the Canyons to the north and east of McKittrick (Forest Service 2004). Additionally, there are likely thousands of acres of protected (e.g., steep slope) and restricted habitat within the potentially affected area of the Guadalupe Mountains Ranger District. Within this area, MSOs are generally found roosting and nesting within caves located in canyon-bound habitat (Forest Service 2003a, 2003b). The vegetation is primarily composed of desert shrubs.

cactus shrub-like oak (*Quercus* spp), pinon pine (*Pinus edulis*), and juniper (*Juniperus* spp) (Forest Service 2003b) These data were used in our analysis to estimate MSO habitat that may be burned by either prescribed or wildland use fires

Other past and present projects that may contribute to the environmental baseline within this RU and that may affect the MSO include Wildland Urban Interface Projects on Forest Service lands (Service 2001c) livestock grazing, the Forest Service's Rio Penasco II vegetation management project (Service 2002 2005), recreational activities, recreation and scenic vista developments road construction maintenance activities land exchanges, right-of-way issuances, power line construction and catastrophic wildfires their suppression and rehabilitation activities As noted the risk of catastrophic habitat loss due to fire is extremely high in the Guadalupe Mountains Past fires have modified thousands of acres of suitable MSO habitat and likely impacted multiple MSO territories However based on the recent MSO surveys, the past large fires of the 1990s with the exception of the Marcus Fire did not reach into the canyon nesting and roosting areas and appear to have had no effect on the occupancy of canyon habitat within the park Almost all canyon habitat in the park is currently occupied by MSO, including the PAC within the 1994 Marcus Fire scar (F Armstrong pers comm , 2005)

EFFECTS OF THE ACTION

Restoring fire a natural disturbance process to its historic role at GMNP is one of the Park s appears to be a high management priority GMNP s Fire Management Program seeks to safely and effectively manage WFURB and prescribed fires, while providing for the protection of life property, and the Park s natural and cultural resources The fire program implements deliberate and measurable actions that are monitored to determine if the conditions produced are favorable sustainable, and maintain or improve ecosystem health

With the arrival of Euro-Americans into the area the patterns of fire changed dramatically mostly from grazing and intense fire suppression activities in the 20th century Some forest habitats have become denser and more prone to high-severity stand-replacing fires An assessment of forest structure at GMNP shows that the absence of frequent low intensity fire has altered and degraded the Park s forests in many ways For example within the coniferous forest habitat type there is a high stocking density of small trees (<3 in dbh) and ladder fuels are building up Recent insect damage is also apparent in Douglas-fir and ponderosa pine while quaking aspen is diminishing within the Douglas-fir These current forest conditions have created the opportunity for the high intensity high severity stand replacing and stand destroying fires Therefore active management is needed to reduce the threat of fire while ensuring that adequate MSO habitat will exist into the future (USDI Fish and Wildlife Service 1995)

Nevertheless the application of fire should be used carefully in MSO habitat (USDI Fish and Wildlife Service 1995) Fire is one of the most rapidly acting of natural disturbances After a large crown fire components of MSO nesting roosting and foraging habitat can be reduced or eliminated Small-scale wildfires and managed burns (i.e. WFURB and prescribed fires) however have the potential to reduce fuel loadings and create small openings and thinned stands

that increase horizontal diversity and reduce the spread of catastrophic fire. Small-scale fires and lightning strikes also create snags, canopy gaps, and large downed logs, plus they perpetuate understory shrubs, grasses, and forbs which are important habitat components to the MSO and its prey (Moir et al. 1995).

Fires have played an important role in the composition and structure of conifer forests. Generally, historic natural fires in ponderosa pine were light in intensity depending on fuel loadings and weather conditions. This created a situation whereby some areas did not burn, some areas burned intensely with crown fires, and most areas burned lightly leaving large fire-resistant trees, killing shrub top growth, and removing dead fuels (Wright and Bailey 1982). In mixed conifer forests, historic fires often were composed of intense, crown-replacement in small patches. Prescribed fires and WFURB may be expected to alter mixed conifer habitats of the MSO in the short-term to a greater extent now than historically because the fuel accumulations that are characteristic of many MSO nest and roost sites generally place them at higher fire risk. This is particularly true in the project area, as fire has been excluded for many years and fuel loadings are very high and continuous within MSO habitat. In addition, grazing historically occurred in the action area, thereby reducing fine fuels (grasses and forbs) necessary for recurrent low intensity fires, potentially assisting in the establishment of high numbers of tree saplings and encouraging the establishment of shade-tolerant and fire-sensitive species (Belsky and Blumenthal 1997).

Injury to ponderosa pine from ground fires is generally confined to scorch of bark and lower branches because the thick bark of this tree insulates the cambium (Patton and Gordon 1995). Bradley et al. (1992) indicates that ponderosa pine trees that are heavily infected by the dwarf mistletoe (*Arceuthobium campylopodum*) are more susceptible to fire-related mortality and crown scorch than uninfected or moderately infected trees. On moist sites, ponderosa pine often forms two-storied stands that may be quite susceptible to crown fire. The tendency for regeneration of ponderosa pine to form dense understories, or "dog-hair" thickets on such sites, creates fuel ladders that can carry surface fires to the crowns of overstory trees (Bradley et al. 1992). The thinning effect of fire is therefore much more pronounced in dense stands than it is in more open and mature stands. Heavy accumulations of litter at the base of pole and saw-timber-sized ponderosa pine can increase the severity and duration of fire. Dense and two-storied stands of Ponderosa pine are not the case at GMNP.

Mature Douglas fir has relatively high resistance to fire damage. Saplings and small pole-sized trees of this species, however, are vulnerable to surface fires because of their thin bark (Bradley et al. 1992). Douglas fir occurs in open stands, but it also grows in dense stands with continuous understory fuels. Dense sapling and thickets of pole-sized trees can form an almost continuous layer of flammable foliage 10-26 feet above the ground that will support wind-driven crown fires. Crowning and "torching" of individual Douglas fir is also aided by the presence of large dense witches'-brooms caused by the dwarf mistletoe. As with ponderosa pine, heavy fuel accumulations at the base of Douglas fir increase the probability of fire injury. Heavy litter accumulations may allow injury to tree roots, causing delayed mortality and often resulting in sterilization of soils (Bradley et al. 1992). This is a typical condition in many north-facing slopes.

at GMNP

If the National Park Service is able to burn or thin all of the areas within the Park, the proposed action will treat approximately 6 800 acres of MSO habitat over next ten years. If fire extends beyond the Park boundary, there is one MSO PAC and about 1 500 acres of restricted habitat within McKittrick Canyon on the Guadalupe Mountains Ranger District with a high potential to be affected. An additional 9 PACs and about 11 700 of restricted habitat also have the potential to be affected in adjacent canyons. The objectives of the GMNP's FMP are generally consistent with the MSO Recovery Plan's conceptual framework and principles. For example, the Park has 1) designated PACs and 100-acre core acres, and 2) proposed that prescribed burns will not take place during the MSO breeding season. Still, one notable exception to the recommendations of the Recovery Plan includes not deferring the 100-acre core areas from treatments.

The MSO Recovery Plan (USDI Fish and Wildlife Service 1995) recognizes catastrophic fire as the greatest threat to MSO habitat. WFURB and prescribed fires are extremely important management tools needed to enhance and often to restore many of the ecosystem functions and processes. Reduction in habitat and various habitat-based threats have contributed to the listing of the MSO. The long-term benefits to the MSO of many land management actions may contribute, in the short-term, to certain adverse effects to the MSO. WFURB and prescribed fire projects often fall into this category. Species such as the MSO, whose habitats have been reduced, degraded, or altered, may currently respond to fire differently than they did historically when fire occurred in a more natural setting. As noted, the Recovery Plan (USDI Fish and Wildlife Service 1995) encourages fire management programs which take an active role in fuels management and understand the ecological role of fire. Therefore, fire plays the dual role of being both potentially beneficial and catastrophic to the MSO and its habitat.

The guidance from the Recovery Plan that is specific to prescribed fire and WFURB includes

1. Within each PAC designate 100 acres centered on the nest site. These 100 acres will be deferred from treatments described below.
2. Within the remaining 500 acres of the PAC, combinations of thinning trees less than 9 inches dbh, treatment of fuels, and prescribed fire can be used to reduce fire hazard and improve MSO prey habitat. Large logs (greater than 12 inches midpoint diameter), grasses, forbs, and shrubs should be retained or enhanced. Emphasis of the spatial configuration should mimic natural mosaic patterns.
3. Within PACs, prescribed fire treatments can only occur during the nonbreeding season (1 September to 28 February).
4. Following treatments within PACs, effects to MSO prey species and their habitats should be assessed.
5. Within steep slopes (i.e., greater than 40 percent) that are considered protected habitat

thinning of trees less than 9 inches dbh treatment of fuels and prescribed fires and WFURB are allowed No breeding season restrictions apply

6 Within wilderness research areas that are considered protected habitat, encourage the use of WFURB No breeding season restrictions apply

7 Within restricted habitat, the use of prescribed fires and WFURB is strongly encouraged to reduce hazardous fuel accumulations No breeding season restrictions apply, and

8 Within other forest and woodland types proactive fuels management is encouraged No breeding season restrictions apply

The Recovery Plan (USDI Fish and Wildlife Service 1995) encourages the use of prescribed fires but is unclear on guidance for WFURB For this reason the Service issued a policy memorandum in 1997 to describe guidelines for WFURB (prescribed natural fire) (USDI Fish and Wildlife 1997) This guidance includes

- 1 MSO surveys are encouraged but are not required for WFURB areas
- 2 The following relate to areas containing MSO habitat that have not been completely surveyed
 - a protection of the 100-acre PAC center is not required as long as the agency coordinates fire management plans with local biologists
 - b known PAC locations and the associated 100-acre core areas must be incorporated into the FMP
 - c the FMP must identify areas that should be managed conservatively, and
 - d FMPs must contain sufficient detail to evaluate the potential effects to MSOs during section 7 consultation
- 3 There is no breeding season restriction for WFURB

The potential for effects to MSO to occur depends largely upon the specific type of fire activity and its location within or in proximity to MSO habitat or the timing duration and breadth of the action Our understanding is that administrative and other resource constraints (e.g., Go, No-Go Run Sheet) will generally limit the effects of fires on MSO habitat We anticipate that fires will consume some downed logs, snags shrubs and other understory vegetation but prescriptions would likely provide protective measures to reduce some but not all adverse impacts Some of the anticipated effects are 1) charred bark up to ten feet from the ground, 2) needles and leaves may be scorched in the lower branches (usually those less than 20 feet from the ground) and 3) smaller trees occupying the understory may be lost especially when dead fuels have accumulated at their base and/or are already susceptible due to old scars Fire activity

from managed burns may range from creeping surface fires of less than one foot in pine litter and duff to an active surface fire which could actively torch groups of seedling and small pole-sized trees (e.g., 1 to 4 inch dbh). It is also possible that overstory tree canopy cover and understory ladder fuels would be broken and patchy, effectively mitigating opportunities for continuous crown fire runs while allowing limited torching of canopy patches.

Fire prescriptions in MSO habitat would likely generate low to moderate-intensity surface fires. MSOs located in mature overstory trees and in cliff nests would not be directly threatened by flames although they could be affected temporarily by smoke. Roosting adults could easily move away from fire activity and the risk of being killed by flames or asphyxiation would be small. The mesic conditions typical of MSO habitat in GMNP would promote controlled, low intensity burns and would lessen the fuel loads. Nevertheless, adverse impacts to MSO habitat may include the possible destruction of nesting and/or roosting habitat from prescribed fires or WFURB escaping prescription and becoming a wildfire. Prescribed fire intensities will likely be designed to maintain the midstory and overstory canopy stand structure and to break up the continuity of fuels in MSO habitat. Ignition of prescribed fire will likely be designed to reduce ground and ladder fuels within 3 m (10 ft) of the ground while minimizing forest structural changes above that level. Fire variability and the dampening effects of cool, moist microclimate in favorable situations are expected to maintain or even enhance some of the key components of MSO habitat. The implementation of WFURB and prescribed fires should result in cool, low intensity burns within MSO habitat that will mimic natural mosaics. High intensity burns should not occur within MSO habitat or will be small scale (e.g., less than a few acres).

The National Park Service will plan WFURB and prescribed fires in accordance with their wildfire management planning and implementation process described in Directors Order #18 and Reference Manual-18 (National Park Service 1999, 2003). These documents provide internal requirements that the National Park Service will follow to plan and evaluate their WFURB and prescribed fire programs. For example, a prescribed fire project plan will include a description of structure and composition of vegetation types within the project area, fuels characteristics (e.g., fuel loadings, fuel bed depth, and fuel type), identifying and controlling risks to protect resources and property (i.e., risk management), and preburn considerations such as timeframes, special features to be protected, and monitoring needs (National Park Service 1999, 2003, 2003a).

We recently developed policy to adapt a long-term view of the benefits of fuels treatment projects (USDI Fish and Wildlife Service 2002). Some projects, such as the current FMP, may have short-term adverse impacts on the MSO, but at the same time present opportunities for significant long-term benefits. As described above, the Park modeled MSO habitat and conducted surveys prior to this consultation. The Forest Service also has provided similar information. From these data, we expect that no more than about 20,000 acres of identified or modeled MSO habitat have the potential to be adversely affected by the proposed action. The PAC information will be incorporated by the Park as they develop and implement the overarching FMP and individual prescribed fire plans. The conservation measures will also limit potential adverse impacts to the MSO and its habitat because the FMP will incorporate, and the

National Park Service will follow these measures. The Service stresses the need to view MSO data as an essential piece of information managing the fire program at GMNP. Prescriptions will be tailored to maintain key structural features of MSO and small prey habitat. As the burn plans are implemented, these prescriptions will be tested and adaptively managed.

The conservation measures detailed under the proposed action section above represent actions proposed by the National Park Service that were evaluated as part of the jeopardy and the incidental take analyses. The conservation measures promote management of forested habitat so that important and difficult to replace MSO habitat is conserved. Additionally, the measures will assist in reducing habitat simplification (i.e., key habitat components will be retained without impeding the objective of reducing fire hazard) and are intended to protect the best available MSO habitat, while minimize adverse impacts to the MSO. All of the measures will directly lessen the impacts from habitat altering activities on prey species and disturbance related impacts on the MSO.

MSO Habitat

Due to decades of fire suppression within the project area, excessive fuels have become the primary carrier of fire and are likely the causal agent for the extreme fire hazard. For these reasons, management of this habitat component is difficult. For example, the intent of the fuel reduction treatments proposed is to remove as much small and medium-sized dead and down fuel as possible while retaining an acceptable level of large woody debris. As noted previously, burning within and around PACs and MSO habitat will generally follow the guidance in the Recovery Plan, the 1997 Service policy on WFURB, and also be dictated by the National Park Service's conservative prescriptions, other administrative controls, and will use adaptive management. This will assist in the control of these fire events ensuring that, while some dead and down material will be lost, adequate levels will be retained and/or generated by tree mortality while still meeting the desired objectives of treatments. Therefore, we expect that these important habitat components will be retained or replaced throughout MSO habitat.

However, it cannot be ruled-out that instances may occur where loss of the dead and down components reaches a level in a given area that may adversely affect the MSO. The National Park Service expects that such an effect would be very short-term as replacement material (tree mortality from bark beetle and burns, etc.) will be readily available to again bolster this habitat component to acceptable levels in these circumstances. Although short-term adverse affects to MSO habitat may occur, we believe these will be temporary and not likely to cover a significant portion of the action area. Similar to the proposed non-fire treatments, we expect that WFURB and prescribed burning will provide conditions suitable for increased herbaceous plant growth by removing dead plant debris within treated areas. The mosaic effect created by burned and unburned areas is expected to increase herbaceous plant species diversity and, in turn, assist in the production and maintenance of the MSO prey base. In addition, proposed treatments are expected to favor larger conifers and oaks which supply a large amount of forage in the way of seeds, buds, acorns, etc.

The Recovery Plan (USDI Fish and Wildlife Service 1995) recognizes that prescribed natural fire (i.e., WFURB) may be beneficial to MSO habitat in several ways: 1) it can aid in reducing fuel loads and the risk of catastrophic wildfire which may result in the loss of habitat over large areas; 2) it can create a diverse landscape with considerable horizontal heterogeneity which seems to be relatively characteristic of many areas occupied by MSOs and also provides for a diverse prey base, and 3) it can create conditions that maintain shade-intolerant species such as ponderosa pine or Gambel oak in the landscape.

We believe that WFURB and prescribed fires that burn within prescription are not expected to significantly alter canopy closure inside or outside of PACs or other MSO habitat. These burns will likely target dead and live fuels near the forest floor, including dead and down material, live brush, and in some cases "dog-hair" thickets of conifer. Generally, these activities will not affect canopy closure, but will reduce the amount of surface and ladder fuels. Therefore, we believe that the successful implementation of the FMP will assist in reducing the existing threat of catastrophic wildfire.

The Recovery Plan takes a conservative approach to prescribed fires within PACs, recommending that the 100-acre core area not be burned at any time and that PACs not be burned during the breeding season. Alternatively, the WFURB policy guidance is much less restrictive in its approach and allows burning without a breeding season restriction. While acknowledging that MSO may be incidentally taken, the Recovery Plan indicates that such trade-offs are necessary to return fire to the fire-adapted ecosystem in which the MSO evolved (USDI Fish and Wildlife Service 1995). GMNP has indicated that protection of the 100-acre core area is proposed during the breeding season for prescribed fires. WFURB and prescribed fires during the non-breeding season may still affect the 100-acre core areas and PACs (from WFURB).

If a WFURB occurs during the MSO breeding season, MSO breeding and/or foraging may be affected. Alternatively, GMNP has proposed to conduct MSO surveys (to determine occupancy or reproduction), prior to prescribed fires during the MSO breeding season. This information will be used by the National Park Service to determine whether a prescribed fire will have adverse effects on nesting MSOs. If MSOs are not reproducing in a given year, a prescribed fire during the breeding season is likely to result in minimal impacts to the species or its habitat. Light fire that passes through the understory of a nest-roost stand likely will have no adverse effects on MSOs, as long as reproducing MSOs are not present and key habitat components are retained. Alternatively, burning in close proximity to an active MSO nest has the potential to result in the direct or indirect death of adult and young MSO due to loss of nest/roost trees caused by individual or groups of trees crowning or by intense heat generated within steep canyons. This is especially true during May through July when young are unable to fly. Burning within the 100-acre core area, regardless of the time of year, will not permit the core area to act as a buffer to offset any short-term negative effects of burning to the MSOs and their habitat. Depending on the severity and spatial configuration of the burn (e.g., whether the 100-acre core is burned or habitat components are retained within the PAC), these effects could range from simply being flushed from a roost or nest to abandonment of the nest and nestlings. We anticipate that burning within the breeding season and within the 100-acre core area have the

potential to harass or harm nesting MSOs. We find that effects could occur through loss of prey habitat or disturbance to nesting MSOs (adults or nestlings).

It may be possible that low-intensity fires benefit MSOs although we are unaware of any definitive scientific evidence to support this conclusion. Bond et al (2002) examined the short-term effects of wildfires on all three subspecies of spotted owls. They determined that spotted owls exhibited high estimates of post-fire survival, site fidelity, and average number of fledglings per pair, one year after both low and high severity fires. Unfortunately, their study describes only very short-term results, and was not designed to address the long-term effects of wildfires on spotted owls. Furthermore, although they indicated that only four of the eight territories that were examined for fire severity were subjected to high-severity fire, the results from low severity fires and high severity fires were not distinguished in the study. Thus, it is not possible to determine from the reported results whether the examined life history components were differentially affected by low and high severity fires. However, they were able to hypothesize that spotted owls may have the ability to withstand the immediate, short-term (1-year) effects of fire occurring at primarily low to moderate severities within their territory. Although a similar hypothesis was not expressed for high severity fires, the researchers stated that the spotted owl may be able to survive wildfires of various sizes and severities. These conclusions are similar to Jenness (2000) that found the presence of a fire in MSO territory did not appear to play a significant role in whether a MSO would be present or reproduce. Stacey and Hodgson (unpubl. manuscript) also reported that effects from a fire that burned in a highly patchy manner (i.e. considerable roosting and foraging habitat remained after the fire) appeared to have little direct impact on MSO.

Bond et al (2002) also stated that while they do not yet advocate wholesale prescribed burning in MSO territories, they do believe that their observations justify large-scale experiments to corroborate their observations and to establish cause-and-effect relationships. While the proposed action does not include an experimental approach, the National Park Service's required monitoring process can potentially contribute to the body of knowledge on the effects of fire to MSOs.

WFURB or prescribed fire may create small openings in the canopy caused by single or groups of trees crowning. The Service believes the risk of trees crowning is more probable in MSO nesting/roosting habitat. The location of quality MSO habitat often corresponds to characteristics that put these sites at higher risk of crowning such as dense, multi-layered canopies, the presence of mistletoe "brooms" and high fuel loadings resulting from high densities of down logs. The loss of some of the lower branches in the canopy may have some effect on MSO foraging. MSOs utilize the "perch and pounce" method of hunting, using the lower branches of trees for perching. The loss of some perching sites when burning within prescription is not expected to significantly affect the ability of MSOs to forage successfully. If low intensity fires can retain the characteristics recommended by the Recovery Plan, then anticipated adverse effects to MSO habitat are likely to be few and may in fact be beneficial.

Burning is expected to result in the loss of some snags and the creation of others, particularly

smaller snags. Following burning prescriptions will facilitate control and allow for a high snag basal area to persist. Therefore, we expect that any loss to snags within a treatment area will be insignificant and discountable. It is also important to note that many MSO within the Park and adjacent public lands forage and nest within steep canyons which will burn differently than forest habitat. For example, burn plans may frequently use natural barriers such as steep canyons or talus slopes as holding areas (fire perimeters) because these areas create excellent natural barriers where fuel loadings are lower, spot fires will likely burn out or fire may not be carried at all.

The random nature of lightning does not allow for predicting where, when, or how many WFURB may occur in the project area. It is expected that the vast majority of lightning that may result in a WFURB will likely occur during the summer months. If a lightning-started fire falls within prescription parameters, it may be managed to meet resource objectives. Otherwise, the fire will be suppressed as rapidly as possible. We find that this process will generally avoid and/or minimize impacts to the MSO.

The National Park Service has conducted surveys and modeled MSO habitat. It is our understanding that the forthcoming FMP will use the identified MSO habitat in the management of fire throughout the Park (i.e., WFURB, prescribed fire, and wildfire suppression). Moreover, the FMP will be updated regularly to incorporate new MSO and other relevant natural resource information. For example, each prescribed fire project plan will identify and consider MSO PACs and other MSO habitat prior to ignition. This information in conjunction with the fire prescriptions and pre-burn considerations (e.g., risk management of identifying and controlling hazards to protect resources and property) will ensure that these areas are managed conservatively (e.g., see USDI Fish and Wildlife Service 1995). This aspect of the current proposed action follows the recommendations of the Recovery Plan and should limit adverse effects to the MSO and its habitat.

Prey Habitat

The effects of fire include both negative and beneficial effects on MSO habitat. Beneficial aspects would include increased response of herbaceous vegetation after a fire. Negative effects would include the loss of MSO prey habitat components such as herbaceous cover, down logs, and snags. The effects of fire on the prey base of the MSO are complex and are dependent on the variations in fire characteristics and in prey habitat. Fire intensity, size, and behavior are influenced by numerous factors such as vegetation type, moisture, fuel loads, weather, season, and topography.

It is suspected that the effects of intense stand-replacing wildfires that dramatically alter forest structure and move the system to earlier seral stages would have longer-term effects on some rodent populations. Likely, early successional species such as deer mice and those that require open habitat with a well-developed herbaceous understory such as microtine voles and pocket gophers, would benefit. In contrast, species that require a wooded or forested overstory would exhibit population declines. The net effect of such fires on the MSO is unclear; a fire that

removes the tree canopy would likely render a portion of the area unusable for foraging by MSO but if the spatial extent of crown loss is limited, a mosaic is created that could provide a diversity of prey for the MSO and actually be beneficial (Ward and Block 1995) Additionally much of the MSO habitat within the Park and adjacent lands is composed of steep canyons, where prey use may differ from other regions (Sorrentino and Ward 2003) Because MSO prey species evolved in ecosystems where fire was a natural process we assume that historically these species survived, and some even benefited from the occurrence of fire Nonetheless effects of fire on small mammals under present environmental conditions are unclear (Ward and Block 1995) The current project may assist in filling some of these data

WFURB and prescribed fires conducted within prescription are likely to have immediate short-term effects to MSO prey habitat Although fire may enhance vegetative density and abundance in the long-term, short-term effects of burning particularly in the spring and early summer when herbaceous vegetation is most critical for reproducing rodents, may limit available forage immediately after the fire event Most WFURB will likely occur during May through August when the rodents would be most affected by habitat loss Thus WFURB may occur during the MSO breeding season Nesting MSOs would be most affected during this time as they would require a consistent supply of prey to successfully fledge young We believe that if a fire burns within an occupied MSO PAC during the breeding season or within the 100-acre core area at any time MSOs may adversely affected from limited available prey

Long-term Benefits of WFURB and Prescribed Fires

Reintroducing fire into the ecosystem could have many benefits Among these are the reduction of woody fuels which would decrease the possibility of intense stand-replacing fires and resulting erosion, soil sterilization and increased plant mortality Ultimately if fire continues to be excluded from the system a major wildfire will occur with potentially devastating effects to the MSO and its habitat Historic low-intensity fires that removed small trees and ground fuels but rarely killed mature trees occurred at frequent intervals Implementing the proposed action would reduce fuels and hopefully begin to restore a natural fire regime in which frequent low-intensity fire would act to maintain a mosaic of fuel loads across the area

We expect that forest health conditions will improve under the current proposed action because WFURB and prescribed fires will be applied across the landscape and should result in management activities that will minimize adverse impacts to the MSO by maintaining and restoring healthy forest conditions Bond et al (2002) hypothesized that spotted owls may withstand the immediate short-term (1-year) effects of fire occurring at primarily low to moderate severities within their territory The Forest Service (2003) also reported similar results following the 2002 Lakes Fire in the Jemez Mountains, New Mexico Under current fuel loads if a fire were to erupt within the proposed project area the event could likely be catastrophic Failure to address the threat of fire by reducing fuel levels will inevitably lead to more and larger fires that result in the continual loss of the MSO and its habitat Still we find that the proposed fire-related activities have the potential to result in adverse effects to MSOs in the short term

Monitoring and Adaptive Management

The FMP and subsequent short and long-term fire effects monitoring program will be collecting information to assess accomplishments and determine effects of management activities on cultural and natural resources (Wildland Fire Management Reference Manual 18, 2002). Pre and post-burn monitoring will evaluate if project objectives were met. This monitoring will also result in digital data, including GIS-compatible data. For example, all fires greater than 100 acres will be mapped using GIS (Wildland Fire Management Reference Manual 18, 2002). These efforts will provide information useful for guiding future forest/fuels management projects, assessing potential impacts to MSO habitat and prey, and will be useful information for recovery of the species (USDI Fish and Wildlife Service 1995).

The Service believes that the proposed FMP should be viewed as a working document and should be subject to constant evaluation and modification if and when needed, based on the results of each year's burning and monitoring that the National Park Service will conduct. Applying new information to land management decisions as it is developed is an important aspect of adaptive management and will result in benefits to the MSO by incorporating this information in the recovery planning process. Much of the discussion above addresses appropriate use of low intensity WFURB or prescribed fires in MSO habitat and the benefits and potential impacts thereof.

Non-burning treatments

The National Park Service indicated that the proposed action will generally follow the recommendations identified in the Recovery Plan (USDI Fish and Wildlife Service 1995). For example, thinning within PACs and restricted habitat will conform to those recommended in the Recovery Plan. Mechanical thinning within MSO protected habitat would remove understory trees less than 9 in dbh. These types of treatments would remove fine fuels from below, but would only slightly reduce the basal area and canopy closure. If the National Park Service follows the spirit and intent of the Recovery Plan when applying these prescriptions, the outcome would likely leave a relatively dense over-story, but reduce the risk of habitat loss by wildfire. This will provide for the high canopy cover component preferred and used by the MSO for nesting and roosting.

Moreover, any canopy cover lost from mechanical thinning would be short-term, because crown densities on the remaining trees would increase from reduced competition. Snags are a key habitat component that could be affected by mechanical thinning. Because the National Park Service has indicated that they will follow the Recovery Plan, all snags that do not pose a threat to life or property will be retained. We conclude that non-burning prescriptions (e.g., mechanical or manual thinning) meet the spirit and intent of the fire abatement program described in the Recovery Plan. Therefore, the proposed thinning activities will not be adverse or result in take, but will result in long-term benefits to the MSO (USDI Fish and Wildlife Service 1995).

Noise and visual disturbance

The activities associated with managing a prescribed fire involve igniting and monitoring the fire's progress. After monitoring weather conditions and insuring that proper fuel moisture and wind patterns exist, firefighters will ignite the perimeter of the project area using standard hand ignition practices. The perimeter will likely be divided into sections and lit in a controlled manner. Once a defensible perimeter is established, the interior of the project area will be lit, which often involves aerial ignition in this remote and rugged terrain. Large patches of unburned areas within the perimeter may be re-ignited using drip torches or other hand ignition techniques. Similar to WFURB, while a prescribed fire is burning, small numbers of personnel will monitor the area recording the fire's growth and behavior. In some cases, it also becomes necessary to use suppression techniques to manage the fire. These can range from small efforts such as putting in a fireline around a cultural resource site to suppressing one flank of a fire while allowing the other to grow. It is also possible that the fire could exceed the prescription and cease to be a low-intensity ground fire or could threaten the pre-established project boundaries, in which case full scale suppression activities will be undertaken. These activities could result in increased levels of disturbance to MSO from personnel on the ground and from aircraft.

Disturbance to the MSO may also be caused by human activities within or adjacent to PACs and during WFURB, prescribed fires or wildfire suppression. Disturbance may be caused by fire resource personnel digging fire lines with shovels and other hand tools, walking and igniting with drip torches if "burning out" is needed to control a WFURB and monitoring fire conditions from the ground or air. The National Park Service has indicated that aircraft overflights will likely only be used during emergency life-threatening situations when it is tactically necessary, or when human structures are in danger. The need for aircraft overflights in GMNP will be evaluated on a case-by-case basis using a minimum impact decision document. If aircraft flights over occupied MSO PACs occur during the breeding season (March 1 through August 31), GMNP will maintain a vertical separation of at least 500 feet AGL over ridges and 2,000 feet AGL over canyon bottom MSO habitat. These measures will minimize potential adverse effects on MSOs from noise disturbance.

WFURB or Prescribed Fire Burning Out of Prescription

Regardless of detailed planning and the use of the best fire science, there exists the possibility that a WFURB or prescribed fire may burn out of prescription and become a wildfire. The most likely reason for a WFURB or prescribed fire to go out of prescription would be a change in weather conditions such as wind speed or direction which would result in a subsequent change in fire behavior. The most devastating wildfire would be one that travels into the tree crowns and results in stand replacement over a large area. The results to the MSO of a WFURB or prescribed fire becoming a wildfire may include the direct loss of MSO as well as loss of nest/roost habitat located in PACs. If a wildfire occurs in such habitat during the breeding season, the fire may result in the loss of MSO nests as well as young MSOs who may not be able to fly to safety.

Wildfires that burn hot will result in the loss of MSO prey habitat such as down logs and

unburned snags. In addition to the direct loss of MSO nest/roost habitat caused by a wildfire effects to MSOs may also be caused by the actions taken to suppress the fire. These actions include back burning to contain the fire and prevent its further growth, the use of chainsaws and the cutting of trees, the use of aircraft and the dropping of water or retardant, and the presence of humans in PACs. If a WFURB or prescribed fire results in a wildfire, the result could be harassment or harm to MSOs.

The variability of WFURB or prescribed fire effects and the unpredictable nature of weather, have the potential to result in effects to MSO. For example, it is possible that a WFURB or prescribed fire may burn out of prescription (i.e., resulting in a high intensity burn) or perhaps become a wildfire requiring suppression. A PAC would be considered adversely affected by these management activities if the fire burns with such intensity or suppression activities occur within a PAC that result in the loss of habitat components (USDI Fish and Wildlife Service 1995).

Emergency Consultation Related to Wildfire Suppression Activities

Although wildfire affects the environmental baseline of the MSO and is not an action subject to section 7 consultation, we do consult on activities to suppress the fire. However, the adverse effects of fire suppression are likely minor in comparison to high-intensity fires. During any emergency situation, our primary objective is to provide recommendations for minimizing adverse effects to listed species without impeding response efforts. Protecting human life and property should come first every time. Consequently, no constraints for protection of listed species or their critical habitat are recommended if they place human lives or structures (e.g. houses) in danger.

We have included and analyzed the effects from emergency wildfire suppression activities because the actions are covered within the FMP. The Park does not need to initiate consultation for individual wildfire suppression activities, but should continue to contact us when they determine listed species and/or critical habitat may be adversely affected. The National Park Service should never delay response to the emergency for this contact. The contact should be at your earliest possible convenience. Upon contact, the Park will provide us with as much detail as possible about the location and severity of the emergency. Subsequent calls to the Service will add or update information as appropriate. During these communications, and throughout the emergency response, the Service can provide recommendations that can be implemented to avoid or minimize impacts to listed species and their habitats. We have also included a list of discretionary conservation recommendations in Appendix A. The majority of these recommendations have been identified and used by other Parks as minimum impact suppression tactics (National Park Service 2004).

If the framework for fire suppression actions as described in this consultation cannot be applied during the suppression activities, the National Park Service will consult on an emergency basis after the fire on any activities that may have affected the listed species or habitat. If this framework is followed, the Park will report to Service on the actions taken and effects to the

species and its habitat following the emergency suppression of the wildfire but no further consultation on that incident would be required

Effects from Suppression Activities

Effects to MSOs may be caused by actions taken to suppress wildfires. Wildfire suppression may include a variety of actions including 1) back-burning areas to contain the fire and prevent its further growth, 2) cutting of trees and snags, 3) the use of retardant drops within PACs and nest stands, 4) aircraft overflights in PACs, 5) the construction of hand and dozer lines through PACs or 6) other activities to contain and suppress the fire. Effects caused by the wildfire itself are not part of consultation. In most cases it is difficult to differentiate effects caused by wildfire and those caused by suppression actions. In addition, while it is probable that additional habitat damage would have resulted had suppression actions not been taken, it is impossible to assess what may have happened in the absence of suppression activities. Thus the discussion that follows describes the effects that may result from an emergency action. Many of these possible effects may also result in the absence of suppression activities and could, therefore, be attributed to a wildfire.

Similar to WFURB and prescribed fire, wildfire suppression can result in activities (e.g., digging fire lines, igniting vegetation, and monitoring fire conditions from the ground or air) that may cause disturbance to MSOs. Suppression activities that disturb habitat, such as back-burning, falling dangerous trees and/or snags that are potential fuels, clearing brush or downed fuels, and limbing or thinning trees to reduce ladder fuels can also affect the MSO. Bulldozer and hand-line construction or other habitat-disturbing activities can result in modification of MSO habitat. Use of bulldozers, chainsaws, and other equipment to remove fuels can also result in significant losses of key habitat components. Additionally, noise from air operations (e.g., fixed wing aircraft or helicopters), especially low-flying aircraft dropping water or retardant, can contribute to disturbance of MSOs. Back-burning in MSO habitat can result in loss of key habitat components, contribute to the general disturbance of MSO, and even result in the loss of individual MSOs. Alternatively, many of these impacts may be short-term or insignificant (e.g., see Bond et al. 2002, Jenness 2000, Stacey and Hodgson unpubl. manuscript).

Although wildfire suppression activities are included in the proposed action and may be required, the effects of wildfire are unpredictable and difficult to analyze. Information gathered during or after emergency wildfire suppression or immediate rehabilitation activities may assist us in developing proactive recommendations for other resource agencies. We recognize that the Park Service's policy of minimum impact suppression activities as well as the incorporation of conservation measures into the proposed action will assist in minimizing adverse effects of suppression activities on MSOs (National Park Service 2005).

We believe it is important to note that current forest conditions create a high fire hazard. Without active fire management from WFURB or prescribed fire, suppression activities from future forest conditions would likely be much greater than those that may occur under the current proposal. We expect that forest conditions will improve throughout this project, lessening the

overall risk of catastrophic wildfire to the MSO within the action area. Nevertheless, because of the unpredictable nature of wildfire, we anticipate that emergency suppression activities may result in harm or harassment of MSO. For these reasons, we strongly recommend that you respond appropriately to the emergency and contact the Service at your earliest convenience. Because of the difficulty in projecting what impacts may occur to MSO from the wildfire suppression, the variety of outcomes are addressed in our incidental take statement.

Interrelated and Interdependent Actions

We also must consider the effects of interdependent and interrelated actions of this proposed project to the MSO. Interrelated actions are actions that are part of a larger action, and are dependent on the larger action for their justification. Interdependent actions are actions that have no independent utility apart from the action under consideration. The proposal includes fire management units on adjacent National Forest lands. The potential to manage or suppress fires on adjacent lands is considered interrelated and interdependent with the implementation of the proposed project. The inclusion of adjacent lands makes the management of fire safer, cheaper, and more likely to mimic natural patterns. For example, if fire extends beyond the Park boundary, there are ten MSO PACs and other MSO habitat within the Guadalupe Mountains Ranger District with a high potential to be affected. From these activities, we anticipate identical affects MSO as described above. Therefore, we anticipate that MSOs may be taken within PACs as a result of fire management activities on adjacent public lands.

Indirect effects

Indirect effects are those that are caused by, or result from, the proposed action, and are later in time but are reasonably certain to occur. Rehabilitation activities are indirect effects resulting from the implementation of the proposed action. We expect that rehabilitation activities will only be utilized after wildfires. GMNP informed us that they will follow the Department of Interior's guidance on the use of burned area emergency rehabilitation activities (BAER) (National Park Service 1999). These rehabilitation activities are variable and reflect the unpredictable nature of wildfires. The National Park Service will also coordinate BAER activities with the Service. It is our expectation that the majority of these actions will likely result in insignificant and discountable effects to the MSO.

Summary

Given the considerable degree of conservation measures incorporated into the National Park Service's proposed action, the general adherence to recommendations outlined in the MSO Recovery Plan, and the high likelihood that WFURB or prescribed fires will result in low to moderate intensity burns, we believe that many of effects to MSO within the action area will result in short-term adverse affects with long-term benefits to the MSO. We have identified those actions that may result in adverse affects or take for the MSO (e.g. WFURB burning during the breeding season or burning anytime within the 100-acre core area). We also recognize that there is a small potential for either a WFURB or prescribed fire to burn out of

prescription and result in a wildfire which could also result adverse effects or take

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions on endangered or threatened species or critical habitat that are reasonably certain to occur in the foreseeable future in the action area considered in this biological and conference 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. Cumulative effects analysis as stated here applies to section 7 of the Act and should not be confused with the broader use of this term in the National Environmental Policy Act or other environmental laws. The Service's most recent assessment of the MSO and its habitat on non-Federal lands is found in the final rule designating critical habitat (USDI Fish and Wildlife Service 2004).

In past BOs, it has been stated that, "Because of the predominant occurrence of the MSOs on Federal lands, and because of the role of the respective Federal agencies in administering the habitat of the MSO, actions to be implemented in the future by non-Federal entities on non-Federal lands are considered of minor impact." However, future actions on non-Federal lands adjacent to the National Park Service and Forest Service lands that are reasonably expected to occur include urban development, road construction, land clearing, fuelwood gathering, and other associated actions.

Some activities that are likely to occur within the action area include various forms of recreation in MSO habitat. Such recreation can result in a variety of effects to MSO, primarily through disturbance of MSOs. However, recreation effects are likely minimal to nonexistent given the remote and inaccessible nature of MSO habitat. In summary, all of these activities reduce the quality and quantity of MSO nesting, roosting, and foraging habitat, and cause disturbance to breeding MSOs and contribute as cumulative effects to the proposed action.

CONCLUSION

After reviewing the current status of the MSO, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the MSO. This conclusion was reached because the proposed project is expected to assist the National Park Service in reintroducing and managing fire in the ecosystem within the action area. Intensive destructive fires will likely occur less frequently and the treatments will minimize the potential risk of WFURB damaging life, property, and natural resources. This will assist in lessening the threat of wildfire to the MSO and its habitat.

These conclusions are based on the following:

1. The implementation of the proposed FMP is not expected to impede the ability of the survival or recovery of the MSO within the Basin and Range East Recovery Unit or

range-wide We found that some of the proposed actions have the potential to cause adverse effects to small areas of MSO habitat Nevertheless, it is anticipated that these impacts will be short-term

- 2 The National Park Service will continue to conduct surveys to determine MSO occupancy and reproduction and if appropriate, designate PACS,
- 3 The conservation measures included above will be implemented to minimize or avoid effects to the MSO and its habitat
- 4 The proposed thinning activities are generally considered consistent with the intent of the Recovery Plan,
- 5 Fires are a natural part of the ecosystem in which the MSO has evolved The chance of catastrophic fire in the area, which is one of the concerns for MSO described in the Recovery Plan will decrease from current levels The Recovery Plan recognizes the importance of allowing fire to return to southwestern forests
- 6 We anticipate no more than one MSO PAC will be harmed through the life of the project or one MSO PAC per year harassed from WFURB prescribed fires or suppression activities (see take statement below), and
- 7 Suppression activities from future forest conditions without managed fire would likely be much greater than under the current proposal

INCIDENTAL TAKE

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption Take is defined as harassing harming pursuing, hunting shooting wounding killing trapping capturing or collecting or attempting to engage in any such conduct Harass is further defined by us as intentional or negligent actions that creates 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 and sheltering Harm is further defined by us to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as 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 a prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement The measures described below for the MSO are non-discretionary and must be implemented by the NPS so that they become binding conditions of any grant or permit issued as appropriate in order for the exemption in section 7(o)(2) to apply

The NPS has discretion to regulate the activity that is covered by this incidental take statement. If the NPS 1) fails to require that any permittee or contractor adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit grant or contract document and/or 2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, we recommend that the NPS report the progress of the action and its impact on the MSO to the Service as specified in the incidental take statement.

Amount or extent of take

Our policy states that incidental take can only be supported if an activity compromises the integrity of an MSO PAC (USDI Fish and Wildlife Service 1996). Take is considered unlikely from actions outside of PACs because areas that may support MSOs have been adequately surveyed in the last few years. The Service anticipates that the proposed action will result in incidental take of MSOs in the form of harm and harassment due to potential for significant habitat alterations of MSO habitat from WFURB prescribed fire, or suppression activities. This determination is based on the knowledge that the proposed action has the potential to either alter MSO habitat or directly affect MSOs (USDI Fish and Wildlife Service 1995).

Using available information as presented within this document, the Service has identified conditions of probable take for MSO associated with PACs. Based on the best available information concerning the MSO habitat needs of this species, the project description, and information furnished by the National Park Service, take is anticipated for up to one MSO PAC through the life of the project (i.e., harm) or one MSO PAC per year (harass). This taking could be in the form of death, injury, harm or harassment of up to two adults and associated eggs/juveniles. Thus, one PAC may be harmed or up to 10 PACs may be harassed through the life of the project. We consider this take an upper limit anticipated for the project (through fiscal year 2014). Any such take will be reported to the Service on an annual basis (see Reasonable and Prudent Measures). Only that incidental take as described below which occurs will be tallied and reported in the MSO baseline. Therefore, although the National Park Service is permitted the incidental take below, such take will not be counted unless it occurs. Authorized taking will be considered to have been exceeded if the following occur:

a) WFURB or prescribed fire burns

- 1) within one MSO PAC that is known or suspected to be occupied during the breeding season (March 1 through August 31) (harm) (permitted take is one pair MSO and/or associated eggs/juveniles in the form of direct mortality through the life of the project) or
- 2) within the 100-acre core area or an area centered around the known or presumed nest location of an MSO PAC during the non-breeding season (September 1 through February 28) (harass) (permitted take is one PAC per year) or
- 3) at high-intensity within greater than 10 percent of any MSO PAC during the non-

breeding season (September 1 through February 28) (harass), (permitted take is one PAC per year) or

b) WFURB or prescribed fire burning out of prescription becoming a wildfire requiring suppression, and suppression actions occur

1) within one MSO PAC that is known or suspected to be occupied during the breeding season (March 1 through August 31) (harm), (permitted take is one pair MSO and/or associated eggs/juveniles in the form of direct mortality through the life of the project), or

2) within the 100-acre core area or the area centered around the known or presumed nest location of an MSO PAC during non-breeding season (September 1 through February 28) (harass), (permitted take is one PAC per year), or

3) within greater than 10 percent of any MSO PAC during the non-breeding season (September 1 through February 28) (harass) (permitted take is one PAC per year)

The Service anticipates incidental take of MSO will be difficult to detect because finding a dead or impaired individual is unlikely due to the large acreage of potentially affected habitat in the project area and the remoteness of much this habitat. The National Park Service informed us that if, during the ten-year duration of the proposed action, any PAC is affected in one or more of the manners described above, GMNP will contact our office to determine if reinitiation of consultation is necessary. It is important to note that wildfires may affect the environmental baseline of the MSO but are not a discretionary action subject to section 7 consultation. Although we do consult on activities to suppress wildfire, incidental take does not apply to the impacts directly associated with the wildfire.

Effect of the take

In the accompanying BO, the Service determined that this level of anticipated take is not likely to jeopardize the continued existence of the MSO.

Reasonable and Prudent Measures for the MSO

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take:

- 1) The National Park Service shall conduct all WFURB or prescribed fire activities in a manner that will minimize adverse effects to the MSO and minimize modification and loss of MSO habitat.
- 2) The National Park Service shall document all actions, report incidental take, and monitor the effects of the proposed action.

- 3) If fire suppression is initiated, suppression activities shall be carried out in a manner that minimizes adverse affects to the MSO and minimizes modification and loss of MSO habitat unless such actions would threaten life or property. This represents the indirect effects of WFURB or prescribed fire burning out of prescription or the direct effects of suppressing a naturally-ignited wildfire

Terms and Conditions for the MSO

In order to be exempt from the prohibitions of section 9 of the Act the NPS and their employees, contractors, or subcontractors must comply with the following terms and conditions which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

The following Terms and Conditions are established to implement Reasonable and Prudent Measure 1

- 1.1 Where physically practicable and in a manner that does not compromise human safety in any way identify and use the 100-acre core areas to reduce adverse effects to the MSO by managing or retaining key MSO habitat components, without impeding the objectives of the FMP
- 1.2 If it becomes apparent that a fire might enter MSO habitat and affect a PAC to the extent practicable, attempt to determine the location and breeding status of MSO in that PAC
- 1.3 All field personnel who implement any portion of the proposed action shall be informed of regulations and protective conservation measures as described in this biological opinion, the environmental assessment and the biological assessment for the MSO
- 1.4 During any emergency situation the primary objective for the MSO is to provide recommendations for minimizing adverse effects without impeding response efforts. During emergency events protecting human life and property should come first every time. Consequently no constraints for protection of MSO habitat are necessary if they place human lives or structures (e.g. houses) in danger
- 1.5 The NPS shall ensure that all pertinent information from the reasonable and prudent measures of this biological opinion is included in the final burn plans for all fire management actions

The following Terms and Conditions are established to implement Reasonable and Prudent Measure 2

- 2.1 The NPS shall document all actions, report incidental take, and monitor the effects of the proposed action on the MSO and its habitat. Those findings shall be reported to us

by December 31 of each year. The report shall document the areas and acreage burned, the type of fire (prescribed fire, WFURB wildfire), the name(s) of any PAC(s) subjected to fire, the extent of any suppression actions, the implementation and effectiveness of the terms and conditions of this biological opinion, information about MSO monitored or encountered (including MSO surveys that were conducted), any rehabilitation completed, quantification of any incidental take as defined in this biological opinion, and any recommendations for actions in the upcoming year(s). Maps shall also be provided which will include each fire event and thinning activities that occurred. This action will ensure the environmental baseline for the MSO is reviewed annually to rectify anticipated effects with those that occurred.

- 2.2 The NPS will ensure that sufficient monitoring of the effects of fire on key habitat components of MSO habitat will be conducted after each fire event. Such monitoring shall be consistent with NPS monitoring requirements and protocols.
- 2.3 To the extent practicable, the NPS's will conduct fire-severity monitoring in MSO habitat after each fire event. If the observed proportion of the event in high to moderate-to-high severity categories is greater than that expected in the incidental take statement of this biological opinion, then prescriptions will be adjusted to ensure that fire severity of future events are reduced.

The following Terms and Conditions are established to implement Reasonable and Prudent Measure 3:

- 3.1 The NPS shall promptly notify the New Mexico Ecological Services Field Office of any declared wildfire actions in MSO habitat.
- 3.2 A Resource Advisor will be available for all activities that affect MSO habitat associated with the fire management. Resource Advisors shall have knowledge of the MSO and its habitat. The Resource Advisor shall possess maps of all PACs and/or modeled MSO habitat in the project area. The Resource Advisors shall coordinate MSO concerns and serve as an advisor to the Incident Commander/Incident Management Team. He/she shall also serve as field contact representative responsible for coordination with our New Mexico Field Office and shall monitor fire-related activities to ensure protective measures endorsed by the Incident Commander/Incident Management Team are implemented.
- 3.3 All fire suppression actions in MSO habitat will occur to the maximum extent possible using minimum impact suppression tactics. This will include actions consistent with the Recovery Plan such as not removing trees over 9 inches dbh in PACs unless it is deemed necessary for tactical and/or safety reasons or to prevent the fire from affecting additional MSO habitat.
- 3.4 MSO habitat disturbed during fire suppression activities such as fire lines crew

camps, and staging areas shall be rehabilitated to prevent their use by vehicles or hikers

- 3.5 The Park shall use identified MSO habitat to prioritize areas for protection and locate access points for suppression, WFURB, and prescribed burning activities. This information will be communicated in advance (when feasible) to fire management personnel. For example, fire camps, staging areas and any other areas of disturbance created for fire suppression actions shall be located outside of MSO habitat, whenever possible.

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 recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for these species. In order for us to be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species and their habitats, we request notification of the implementation of the conservation recommendations. We recommend the following conservation recommendations be implemented:

1. The National Park Service should continue monitoring PACs and conducting MSO surveys.
2. The National Park Service should design and implement experimental fire treatments as recommended in Bond et al. (2002) (enclosed).
3. The National Park Service should meet with the Service annually to share fire and MSO information. Using these data, the Service will reassess the amount of take and provide any additional guidance or clarifications to this biological opinion as necessary to facilitate project implementation.
4. The National Park Service should work within an adaptive management context with regards to fire management activities in MSO habitat.
5. The National Park Service should consider implementing the discretionary conservation recommendations identified in Appendix A during emergency wildfire suppression. Protecting human life and property should come first every time. Consequently, no constraints for protection of listed species or their critical habitat are recommended if they place human lives or structures in danger.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or

benefiting MSO, the Service requests notification of the implementation of any conservation recommendations

DISPOSITION OF DEAD OR INJURED LISTED ANIMALS

Upon finding a dead, injured, or sick individual of an endangered or threatened species (e.g., MSO), initial notification must be made to the nearest Service Law Enforcement Office. In New Mexico, contact (505/346-7828) or the New Mexico Ecological Services Field Office (505/346-2525). Written notification must be made within five calendar days and include the date, time and location of the animal, a photograph, and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animals shall be submitted to educational or research institutions holding appropriate State and Federal permits. If such institutions are not available, the information noted above shall be obtained and the carcass left in place.

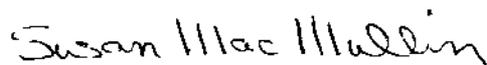
Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, we should be contacted regarding the final disposition of the animal.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposal to implement the Guadalupe Mountains National Park Fire Management Plan, Texas. As required by 50 FR 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 impact 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 that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action.

In future communications regarding this project, please refer to consultation #2-22-03-F-738. If you have any questions or would like to discuss any part of this biological opinion, please contact Eric Hein of my staff at (505) 761-4735.

Sincerely,



Susan MacMullin
Field Supervisor

cc

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Attachment A**Conservation Measures for Emergency Wildlife Suppression**

For any fire suppression activity we recommend you consider implementing the following measures. We stress that firefighter and public safety is the first priority in every fire management activity. We also recognize that you must set priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources based on the values to be protected, human health and safety, and costs of protection. However, if these measures can be implemented, effects to listed species and their habitats will often be much reduced. We may recommend additional measures, or modifications of the measures below, during suppression activities.

1. All personnel on the fire should be informed about listed species and the importance of protecting their habitats and minimizing take. This is best identified in the incident objectives.
2. Resource Advisors are designated to coordinate natural resource concerns including listed species and other resources. Resource Advisors may do any of the following: identify protective measures endorsed by the Incident Commander, survey prospective campsites, aircraft landing and fueling sites, and perform other duties necessary to minimize adverse effects to listed species and their habitats. Resource Advisors and monitors should be on call at all times during the fire season.
3. Whenever possible, crew camps, equipment staging areas, and aircraft landing and fueling areas should be located outside of listed species habitats, and preferably in locations that are previously disturbed. If camps must be located in listed species habitat, the Resource Advisor should be consulted to ensure habitat damage and other effects to listed species are minimized and documented.
4. The effectiveness of suppression activities and listed species minimization measures should be evaluated after a fire. Procedures should be revised as needed.
5. Minimize disturbance to the MSO during emergency rehabilitation activities.
6. Treat MSO protected and restricted habitat according to Recovery Plan standards unless overriding management situations require their removal to protect human safety and/or property (e.g., the removal of hazard trees along roads, in campgrounds, and along power lines).
7. Snags or hazard trees should be felled only when essential for control of the protection of structures or resources, or for safety of personnel.
8. All treatments should retain some trees greater than 18 inches dbh to the extent that it does not impede the objectives of stabilizing and preventing unacceptable degradation to natural and cultural resources, minimizing threats to life or property resulting from the effects of the fire, or

to repairing/replacing/constructing physical improvements necessary to prevent degradation of land or resources

9 When feasible existing roads or trails should be used during rehabilitation activities All new temporary or reopened roads should be closed following project completion, both within and outside of MSO habitat

10 Resource advisors or biologists familiar with the MSO should be on the BAER team These resource advisors should be utilized to ensure that activities do not adversely affect the MSO and are aware of all sensitive areas (e g PACs)

11 The use of dozers should be minimized and resource advisors should be consulted when appropriate Dead or dying trees should be cut or limbed only to the extent needed Rehabilitation of any fire lines should be considered

12 Staging areas for equipment should not be located within riparian areas or MSO habitat

13 Burned area emergency rehabilitation (BAER) activities should be consulted on independently unless these activities are truly considered emergency actions We encourage monitoring the effectiveness of these actions after major fires

14 When the BAER plan is finalized, provide a copy to the Fish and Wildlife Service

Appendix B

Table 1 Wildland fire use decision criteria

| Decision Criteria | Questions ¹ |
|-----------------------------|--|
| Ignition | Is it a natural source? Is the location within the wildland fire use zone? |
| Management Objectives | Are resource objectives being met? Are potential effects on natural and cultural resources within the acceptable range of effects and variability? |
| Size | Is the current and expected size known? Would an escape or the potential for escape from the maximum management area be acceptable? |
| Fuels | Are live fuel moistures within prescription? |
| Weather | Are local forecasts and drought indicators (1000-hr TLFM, Palmer drought index) acceptable? |
| Topography | Is the terrain accessible and safe for crews to work in locations for potential holding actions along the maximum management area? |
| Resource Availability | Are local regional or national resources available? |
| Safety of Life and Property | Can the threats to firefighters staff, visitors residents neighbors, associated property and infrastructure be minimized? |
| Environmental Constraints | Is smoke dispersal and direction acceptable? |
| Political Constraints | Is managing this fire for wildland fire use compliant with current policy moratoriums, political constraints funding and efficiency issues? |

¹Must answer Yes to all criteria to reach a Go decision on wildland fire use Any No answers result in a No-Go decision declaration of a wildfire and initiation of suppression activities Once a wildfire is declared, the fire cannot be reverted to wildland fire use