

BIOLOGICAL OPINION SUMMARY
Fort Valley 10K

Date of opinion: March 11, 1999

Action agency: U.S. Forest Service, Coconino National Forest, Peaks Ranger District

Project: Fort Valley 10K Analysis Area

Location: Coconino County

Listed species affected: Mexican spotted owl (*Strix occidentalis lucida*) and bald eagle (*Haliaeetus leucocephalus*)

Biological Opinion: Non-jeopardy for the Mexican spotted owl. Concurrence with “may affect, not likely to adversely affect” for the bald eagle.

Incidental take statement:

Level of take anticipated: The Service anticipates incidental take will occur to one pair of Mexican spotted owls and/or their young associated with the Orion Springs PAC (040207) for the 1999 breeding season. Incidental take of the adult birds is in the form of harassment. Incidental take of the juveniles would include both harassment and mortality. This take is due to high levels of recreational use within the PAC. Exceeding this level may require reinitiation of formal consultation.

Reasonable and prudent measures: Two measures are provided. These include minimizing effects of recreation on the MSO and monitoring. Implementation of these measures through the terms and conditions is mandatory.

Terms and conditions: Terms and conditions implement reasonable and prudent measures and are mandatory requirements. Six terms and conditions are provided. These include completing trail and camping closures prior to March 2000, monitoring recreational use and camping in the Orion PAC, monitoring of MSO, and reporting.

Conservation recommendations: One conservation recommendation is provided. Implementation of conservation recommendations is discretionary.

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AESO/SE
2-21-99-I-145

March 11, 1999

Mr. Gene Waldrip, District Ranger
Peaks Ranger District
5075 North Highway 89
Flagstaff, Arizona 86004

Dear Mr. Waldrip:

We have reviewed the Threatened and Endangered Species Analysis and the Environmental Assessment (EA) for the Fort Valley 10K received in our Flagstaff Suboffice on December 10, 1998. The Forest Service requested concurrence with determinations of "may affect, not likely to adversely affect" for the Mexican spotted owl (*Strix occidentalis lucida*) (MSO) and the bald eagle (*Haliaeetus leucocephalus*). In addition, the Forest Service made a determination of "no affect" for the black-footed ferret (*Mustela nigripes*) and the peregrine falcon (*Falco peregrinus anatum*).

On March 3, 1998, the Forest Service requested formal consultation for the MSO. This request was based upon discussions between the Service and Forest Service which indicate that implementation of specific protective measures included in the preferred alternative for the MSO will not occur prior to the 1999 breeding season, as was previously planned. The Service and Forest Service believe existing recreational impacts may be negatively affecting a pair of MSO.

The Grand Canyon Forests Foundation (a nonprofit organization) and the Coconino National Forest have established a Cooperative Agreement to work cooperatively to demonstrate new forest management approaches in improving and restoring the ecosystem health of the ponderosa pine forest ecosystem where urbanized areas interface with the forest (Flagstaff Urban Wildland Interface). This cooperative effort seeks to involve the greater Flagstaff community extensively to develop a community-based solution to local forest health problems. This cooperative project is called the Grand Canyon Forests Partnership (Partnership).

The Service has worked closely with the Forest Service in the last year on the Fort Valley 10K as a partner with the Partnership. The Fort Valley project is the first project of the Partnership. The Partnership is a government Reinvention Laboratory Project, which allows the Forest Service to streamline many processes. In the case of threatened and endangered species, the Partnership has worked together to build a preferred alternative which includes measures designed to protect or

Mr. Gene Waldrip

lessen effects to listed species, in this case the MSO. The Service believes full implementation of the MSO protective measures would result in insignificant and discountable effects to the species. Delay in implementation however, allows existing adverse effects to continue for the 1999 breeding season.

CONSULTATION HISTORY

Informal consultation on this project began in September 1997, when the Service began attending Partnership meetings where the proposed action for the Fort Valley 10K project was discussed. Meetings were held every month, and these in combination with informal discussions between the Service and the Forest Service, public meetings, and numerous field visits, led to the formulation of portions of two alternatives which would reduce recreational impacts to the MSO. The Service's concerns for the MSO centered around recreational activity in the Orion protected activity center (PAC). One proposal (included in Alternative A) recommended the closure of the Freidlein Prairie Road to motorized vehicles and the closure and reroute of the Secret and Moto Trails out of nesting areas within the Orion PAC. This alternative was not chosen by the Partnership or the Forest Service due to public concerns for access to the Freidlein Prairie Road. Alternative B, the preferred alternative, proposes keeping the Freidlein Prairie Road open to motor vehicles, closing and rerouting the Secret and Moto Trails out of nesting areas within the Orion PAC, and instituting seasonal closures on dispersed camping along the Freidlein Prairie Road in and adjacent to the PAC.

The Forest Service requested concurrence on December 10, 1998, with a determination of "may affect, not likely to adversely affect" the MSO and the bald eagle. In conversations on February 18 and 19, 1998, between the Service and the Forest Service, it became apparent that implementation of the trail closures and camping closures would not occur prior to or during the current MSO breeding season due to the need to consult on cultural resource concerns. Previous discussions between the Service and Forest Service had revolved around the assumption that these closures would occur as soon as legally possible (i.e., NEPA complete and a Decision Notice was signed). The Forest Service indicated that a Decision Notice for the project will be signed in early March 1999, but due to the need for cultural resource clearance and funding, recreation and camping closures in the PAC will not occur until the fall of 1999 or the early spring of 2000.

Both the Service and the Forest Service believe that existing recreational impacts in the Orion PAC are negatively affecting these owls. The decision by the Forest Service not to implement trail and camping closures as soon as a Decision Notice is signed will result in adverse effects to MSO for the 1999 breeding season. The Service believes the Forest Service has valid reasons for the delay, but the decision to delay implementation is a discretionary action, and the Endangered Species Act requires that the effects of discretionary actions undergo appropriate consultation. Thus, the Forest Service requested formal consultation for the MSO on March 3, 1999.

CONCURRENCES

BALD EAGLE

Bald eagles are observed frequently in the project area in the fall and winter, and potential roosting habitat may exist adjacent to the Fort Valley/Baderville areas, as well as on the southern slopes of the San Francisco Peaks. Currently, no bald eagle roosts are known to exist in the project area or in the areas proposed for silvicultural treatments.

If bald eagle winter roosts are present in and adjacent to the project area, project activities such as tree removal and prescribed fire may be detrimental to eagles using those sites. Some potential exists that roost trees may be targeted for removal under restoration treatments. In addition, prescribed fire has the potential to kill individual isolated trees. These treatments in combination with the timing of the treatments, have the potential to affect wintering bald eagles.

The Forest Service indicated that two mitigation measures will be implemented that will reduce potential risks to bald eagles if found to be roosting in or adjacent to the project area. These are:

1. Train timber markers to locate bald eagle roost sites.
2. If bald eagle roost(s) are located, the thinning prescription around the roost will be evaluated by a wildlife biologist. If changes are necessary, these will be coordinated with implementation personnel.

The Service concurs with the determination that the Fort Valley 10K “may affect, but is not likely to adversely affect” the bald eagle given the implementation of the above mitigation measures, as well as an additional mitigation measure which will establish a 1/4 mile buffer zone on any identified roosting areas. Human activity will be restricted in this area between October 15 and March 15. If any thinning or burning is scheduled to occur in this buffer area, the Service will be contacted and reinitiation will be discussed.

DESCRIPTION OF THE PROPOSED ACTION

The first project selected by the Partnership in the Flagstaff Urban Wildland Interface is the Fort Valley 10K. The 9,100-acre area is located five miles northwest of Flagstaff, Arizona. It is bordered on the south by Highway 180, on the east near Schultz Creek Road, on the north by the Freidlein Prairie Road, and on the west by the Fort Valley Experimental Forest. The Fort Valley 10K includes private land, the Fort Valley Experimental Forest, and portions of the Coconino National Forest. This project area was selected for five primary reasons: the threat of catastrophic fire, especially upslope to the San Francisco Peaks; the density of the pine forest; the

relatively simple land ownership patterns; the ease of accessibility and demonstration of restoration activities, and; the high recreation use. The Fort Valley project area consists of 6,987 acres of National Forest. The four vegetation types include 6,456 acres of ponderosa pine, 11 acres of aspen, 470 acres of mixed conifer, and 50 acres of mountain grasslands and meadows. There are no proposed projects affecting the vegetation component in the mixed conifer.

The Forest Service indicated that heavy recreational use and the current forest conditions, such as the density of pine stands, heavy dwarf mistletoe infestations, and unnaturally high fuel loads, are conducive to future catastrophic wildfires in the Fort Valley area. Wildfires will likely be of greater intensity and destruction. Fires will likely travel through the tree tops (crown fire), unlike the low intensity ground fires of the past. The potential losses from such fires are high, because upwind of the Fort Valley area are the San Francisco Peaks (Fort Valley EA, December 1998).

"Restoring" ecosystems encompasses a variety of treatments, ranging from restoring native ecosystem components and natural processes to removing exotic species. However, not all presettlement conditions, those existing prior to Euro-American settlement in the 1870s, have been determined. There is a lack of inventory information for presettlement conditions, particularly conditions like tree densities and tree diameter distributions, and wildlife species and numbers.

The following information is a summary of the preferred alternative as presented in the Fort Valley EA (December 1998). Alternative B is the preferred alternative for the Fort Valley 10K. There are twelve components to Alternative B: Five tree thinning prescriptions; prescribed fire; road closures; trail construction; restoration of grasses, shrubs, and forbs; meadow and riparian restoration; recreation management and aspen restoration. Implementation of most of the proposed actions will occur from early 1999 to about 2002. Thinning of trees will likely be accomplished with timber sales. Timber sales may cover many acres at once, or be a series of small area sales. Timber cutting rights will be conveyed through a standard Forest Service Timber Sale Contract to the Grand Canyon Forests Foundation. Thinning trees less than 5 inches dbh, road work, meadow and riparian enhancement, and trail work will be conveyed to the Foundation through a Cooperative Agreement between the Forest Service and the Foundation. The Forest Service retains the contractual and prescribed fire oversight. The following is a more detailed description of the preferred alternative:

Full Restoration Thinning (690 acres): Full restoration does not mean that presettlement conditions and functions will exist immediately after treatment is complete. Full restoration is simply a maximum effort in changing current conditions toward patterns and environmental functions more like presettlement. The two main objectives of full restoration is to recreate the tree/grass patterns that previously existed, and to restore low intensity fire.

Approximately 690 acres will be thinned to an average of approximately 50 square feet of basal area to reduce the risk of catastrophic fire, enhance the vigor of remaining yellow pines, and develop the understory of grasses, forbs and shrubs. The full restoration treatment is designed to emulate the structure of presettlement forests. The direct evidence of presettlement forest

structure is used as a template for guiding the restoration thinning. No yellow pines and snags (except for safety reasons) are cut. Additional trees selected for retention are based on existing evidences (stumps, snags, downed trees, stumpholes) of trees in the landscape prior to about 1880. Trees selected to be left are "replacement" trees, and generally are the largest, most vigorous trees growing close to the site of the "missing" presettlement tree. Trees retained will therefore be in approximately the same location as their presettlement ancestors, emulating presettlement forest tree patterns. The landscape generally dictates the replacement patterns. To account for evidences of presettlement trees no longer present or missed during tree marking, and to account for natural and operational mortality (logging and burning), additional replacements are left. Thus, 1.5 replacements are left for each presettlement evidence wherever large replacements (>16" dbh) are available. When replacement trees are smaller than 16 inches dbh, three trees are left for each presettlement evidence. Full restoration will only be applied where there are five or more yellow pines per acre currently on the landscape. Most of this treatment will occur in portions of the Fort Valley Experimental Forest. This treatment will also be applied to the small pockets (generally around an acre or less) of residual yellow pines scattered across the rest of the area.

Modified Restoration Thinning (2760 Acres): This prescription is a modification of the full restoration prescription and it retains an increased number of replacement trees. Where there are less than five yellow pines remaining per acre, the full restoration treatment has been modified to increase the number of replacement trees. Thus, in this modified prescription, two replacements are left for each presettlement evidence wherever large replacements (>16" dbh) are available. When replacement trees are smaller than 16 inches dbh, four trees are left for each presettlement evidence. Pockets of small trees (generally less than 10 feet tall and 20 years old), especially in openings with evidences of presettlement trees, shall be retained.

Minimal Restoration Thinning (780 acres): This prescription was developed to enhance the vigor of yellow pines while maintaining significant wildlife cover within a key wildlife corridor and portions of a goshawk post fledgling area (PFA). Trees would be thinned from around presettlement trees to break up continuous canopy fuels and fuel ladders. Combined with removal of accumulated forest material around the tree boles of yellow pines, the treatment permits return of prescribed fire and provides some protection against mortality of presettlement trees in a wildfire. Thinning around presettlement trees also helps reduce the competitive pressures, which contribute to tree death. Tree thickets will persist and understory recovery will be very limited.

Retention of Dense Tree Canopy Thinning (530 acres): Within the goshawk PFAs, trees are thinned from the understory to reduce ladder fuels and allow for faster growth, but the canopy closure remains at or above 60%.

No Thinning (2090 Acres): No thinning will occur on approximately 2090 acres to protect ongoing research and study sites, wildlife travel corridors in drainages, the Gus Pearson Natural Area, and mixed conifer vegetative sites which have a different fire ecology than the ponderosa

pine vegetation type. No thinning occurs within identified wildlife travel corridors along important drainages. No thinning occurs within mixed conifer sites and important study sites like the Woolsey plots and Chimney Springs Interval Burn Study.

Prescribed Fire (5190 Acres): Prescribed fire will be used to treat thinning slash and to reduce accumulated forest floor materials in order to restore the low intensity fire regime. Thinning slash in all the thinning treatments will be rough piled by tractors or similar machines, piled at landings for disposal, or left lopped and scattered when slash accumulation is not too great. All methods will minimize ground disturbance and retain sufficient organic debris on the forest floor to maintain soil productivity. Slash piles will be burned in the year following piling. Broadcast burning will commence the following year during conditions that minimize smoke and loss of large logs. If the initial broadcast burn is less than satisfactory, a second broadcast burn will follow. Thereafter, maintenance broadcast burns commence at 3-5 years apart for a period of 10 years (pers. comm. T. Randall-Parker). At some point in about 10-25 years, the area will be sufficiently treated to allow almost all human or natural ignited fires to burn without suppression. This future action will undergo a separate analysis and is not included in this proposed action.

Accumulated forest material may be raked away from the tree boles of yellow pines, large snags, and large oaks when it is determined that there is a high probability of mortality or loss. Results of broadcast burns across the forest indicate yellow pine loss is very minimal (estimated at less than 1%) where management activities have previously reduced or eliminated deep duff layers around the boles of large trees. Logging activities in and around yellow pines generally break up this duff layer. No burning will occur on approximately 1800 acres to protect ongoing research and study sites, wildlife travel corridors in drainages, and mixed conifer vegetative sites which have a different fire ecology than the ponderosa pine vegetation type.

Roads: In Alternative B, all non-system roads (two-track roads) will be obliterated (about 5.5 miles). Past decisions will be implemented (about 13 miles of road remain to be closed or obliterated to fulfill current Forest Service decisions). This action results in 25 miles of forest road being available for vehicular use. Freidlein Prairie Road (4 miles) will remain open to vehicular use. Vehicular travel is allowed on all roads and areas unless restrictions are posted.

Trails: In the residential area of Magdalena, an east-west multi-user trail within a mile of the private properties will be built/designated to tie the social trails to a system trail. A north-south trail (mostly following the existing non-system "Moto Trail") will be built/designated to connect the Magdalena east-west trail to the "Moto Trail" just south of Freidlein Prairie Road. The "Secret Trail" (also a non-system trail) will be realigned to the south out of the nesting area of the Orion Mexican spotted owls. The east end of the realignment will tie into the Schultz Tank area, while the west end of the realigned "Secret Trail" will tie into a new east-west route that is constructed just below the pipeline and continue west to the Snowbowl Road. A new trailhead will be constructed off the Hart Prairie Road and another one to the west of Magdalena off of Road 164B. The latter trailhead may integrate with a potential snow play area. All existing social trails will be closed/obliterated, unless they are designated as a system trail or are needed

to access the private land between the Magdalena collector trail and private land. The Forest Service will work with the public on trail use ethics, and will coordinate volunteer efforts needed to accomplish trail work and signs.

Riparian Restoration: Where the potential for riparian qualities exist, improvements will be designed to bring back riparian characteristics to provide riparian habitat for birds, animals, and plant species that depend on these unique, water dependent environments. Chimney Spring will be restored by capping the pipe and removing the earthen tank downstream, thereby reestablishing natural flows. The spring will be fenced, if needed, to exclude livestock and elk. The Forest Service will work with the Navajo Nation (livestock permittee) to coordinate water uses.

Understory and Meadow Restoration: Thinning to reduce the number of trees and prescribed fire (broadcast burning) will improve the quantity and quality of native perennial grass species, primarily Arizona Fescue and mountain muhly, and reduce the noxious weed, dalmation toadflax. Target species for improvement and maintenance are fendler's ceanothus (*Ceanothus fendleri*), wild rose (*Rosa woodii*), and golden or wax currant (*Ribes aureum*, *R. cereum*).

Livestock grazing will be deferred until there is adequate recovery of the understory to carry fire. Through recommendations to the Game and Fish Commission and use of other strategies, elk populations will be managed to meet the understory recovery objectives.

About 5 tons per acre of forest litter will be retained on harvest sites to provide nutrients for recycling and provide microclimates for grasses, shrubs, and forbs. This will also help protect the recovering understory from grazing effects of elk and livestock. The meadow adjacent to Forest Road 164B and Chimney Springs will be restored by removing and/or ripping the roads in the meadow, seeding with native seed, and fencing to discourage vehicular use. Large group use and activities not consistent with rehabilitation plans will be discouraged. The meadow is currently bisected by roads and heavily used by camping causing soil compaction and trampling of ground vegetation.

Camping on Freidlein Prairie Road: The Freidlein Prairie Road and several user created trails ("Secret Trail" and "Moto Trail") converge in an area traditionally used by a pair of Mexican spotted owls for nesting (Orion PAC). The pair of Mexican spotted owls in the vicinity of Freidlein Prairie Road are being impacted by the increased recreational use in the area and are failing in their ability to reproduce. To reduce harassment of the birds during their breeding season, camping along the last 1.5 miles of the Freidlein Prairie Road will be prohibited from March 1 to August 31, during the MSO breeding season. In addition, dispersed camping sites (about 25 existing sites) will be designated as "approved" dispersed sites along the Freidlein Prairie Road. Camping along the Freidlein Prairie Road except within the designated sites will be prohibited. These sites are currently well defined and repeatedly used. Due to the sloping conditions along the Freidlein Prairie Road, additional dispersed camping opportunities are

very limited. This action will reduce the impacts of dispersed camping to all wildlife in this zone.

Mitigation: Mitigation for wildlife included in the preferred alternative include the following:

- Line snags (> 18" dbh and 20 feet tall) prior to burning to protect habitat for several wildlife species.
- Timing restrictions on harvest activities during the goshawk breeding season (March 1 - September 30) will be placed on all stands within the goshawk PFAs. Prescribed fire is excluded from the breeding season restriction as summer burning may help to protect logs and snags. However, coordination between fire specialists and a wildlife biologist will take place to minimize potential impacts from disturbance.
- For the flammulated owl, maintain clumps of dog-hair thickets and dense patches of trees (1/10 acre) adjacent to potential nesting snags.
- Train all timber marking personnel and others who will be working in the field to recognize Arizona Leatherflower (*Clematis hirsutissima* var. *arizonica*) in order that more field inventory may be conducted.
- Any location of Arizona Leatherflower will lead to re-evaluating potential activities which may effect potential habitat or individual plants.
- Coordinate the layout of trails and camping closure within the Orion MSO PAC with USFWS.
- Construct fire line or use roads outside of owl PAC s to keep prescribed fire from entering these areas.
- Prescribed burning activities during the MSO breeding season (March 1 - August 31) will be coordinated with the wildlife biologist to lessen potential effects.
- Monitor Orion MSO PAC if possible to track changes in use of area following social trail closures, camping restrictions, and new trail development.
- To the greatest extent possible, the camping closure and social trail obliterations should be monitored for effectiveness.
- Corridors for wildlife should be laid out on the ground by a wildlife biologist before marking.

STATUS OF THE SPECIES

The Mexican spotted owl was listed as threatened on March 16, 1993 (58 FR 14248). Critical habitat was designated for the species on June 6, 1995 (60 FR 29914), but was withdrawn in a recent Federal Register notice (63 FR 14378). The Mexican spotted owl was originally described from a specimen collected at Mount Tancitaro, Michoacan, Mexico, and named *Syrnium occidentale lucidum*. The spotted owl was later assigned to the genus *Strix*. Specific and subspecific names were changed to conform to taxonomic standards and the subspecies became *S. o. lucida*. The American Ornithologists' Union currently recognizes three spotted owl subspecies, including the California, *S. o. occidentalis*; Mexican, *S. o. lucida*; and Northern, *S. o. caurina*. The Mexican spotted owl is mottled in appearance with irregular white and brown spots on its abdomen, back, and head. The spots of the Mexican spotted owl are larger and more numerous than in the other two subspecies giving it a lighter appearance. Several thin white bands mark an otherwise brown tail. Unlike most owls, spotted owls have dark eyes.

The Mexican spotted owl is distinguished from the California and northern subspecies chiefly by geographic distribution and plumage. The Mexican spotted owl has the largest geographic range of the three subspecies. The range extends from the southern Rocky Mountains in Colorado and the Colorado Plateau in southern Utah southward through Arizona and New Mexico and, discontinuously through the Sierra Madre Occidental and Oriental to the mountains at the southern end of the Mexican Plateau. There are no estimates of the owl's historic population size. Its historic range and present distribution are thought to be similar.

Using starch-gel electrophoresis to examine genetic variability among the three subspecies of spotted owls, Barrowclough and Gutierrez (1990) found the Mexican spotted owl to be distinguishable from the other two subspecies by a significant variation, which suggests prolonged geographic isolation of the Mexican subspecies and indicates that the Mexican spotted owl may represent a species distinct from the California and Northern spotted owls.

The current known range of the Mexican spotted owl extends north from Aguascalientes, Mexico through the mountains of Arizona, New Mexico, and western Texas, to the canyons of southern Utah and southwestern Colorado, and the Front Range of central Colorado. Although this range covers a broad area of the southwestern United States and Mexico, much remains unknown about the species' distribution within this range. This is especially true in Mexico where much of the owl's range has not been surveyed. Information gaps also appear for the species' distribution within the United States. It is apparent that the owl occupies a fragmented distribution throughout its United States range corresponding to the availability of forested mountains and canyons, and in some cases, rocky canyon lands.

The primary administrator of lands supporting owls in the United States is the Forest Service. According to the Mexican Spotted Owl Recovery Plan (USDI 1995), 91 percent of owls known to exist in the United States between 1990 and 1993 occur on land administered by the Forest

Service. The majority of known owls have been found within Region 3 of the Forest Service, which includes 11 National Forests in New Mexico and Arizona. Forest Service Regions 2 and 4, including two national forests in Colorado and three in Utah, support fewer owls.

A reliable estimate of the numbers of owls throughout its entire range is not currently available due limited information. Owl surveys conducted from 1990 through 1993 indicate that the species persists in most locations reported prior to 1989, with the exception of riparian habitats in the lowlands of Arizona and New Mexico, and all previously occupied areas in the southern states of Mexico. Increased survey efforts have resulted in additional sightings for all recovery units. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico in 1990 using information gathered by Region 3 of the Forest Service. Fletcher's calculations were modified by the Service (USDI 1991), who estimated that there were a total of 2,160 owls in the United States. While the number of owls throughout its range is currently not available, the Recovery Plan reports an estimate of owl sites based on 1990 - 1993 data. An owl "site" is defined as "a visual sighting of at least one adult owl or a minimum of two auditory detections in the same vicinity in the same year." Surveys from 1990 through 1993 indicate one or more owls have been observed at a minimum of 758 sites in the United States and 19 sites in Mexico. At best, total numbers in the United States range from 777 individuals, assuming each known site was occupied by a single owl, to 1,554 individuals, assuming each known site was occupied by a pair of owls.

Past, current, and future timber-harvest practices in Region 3 of the Forest Service, in addition to catastrophic wildfire, were cited as the primary factors leading to listing of the spotted owl as a threatened species. Fletcher (1990) estimates that 1,037,000 acres of habitat were converted from suitable (providing all requirements of the owl, e.g., nesting, roosting, and foraging) to capable (once suitable, but no longer so). Of this, about 78.7 percent, or 816,000 acres, was a result of human management activities, whereas the remainder was converted more or less naturally, primarily by wildfire. Other factors which have or may lead to the decline of this species include a lack of adequate regulatory mechanisms.

Mexican spotted owls breed sporadically and do not nest every year. Mexican spotted owl reproductive chronology varies somewhat across the range of the owl. In Arizona, courtship apparently 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, more typically, early April. Incubation begins shortly after the first egg is laid, and is performed entirely by the female (Ganey 1988). The incubation period for the Mexican spotted owl is assumed to be 30 days (Ganey 1988). During incubation and the first half of the brooding period, the female leaves the nest only to defecate, regurgitate pellets, or to receive prey from the male, who does all or most of the foraging (Forsman *et al.* 1984, Ganey 1988). Eggs usually hatch in early May, with nestling owls fledging four to five weeks latter, and then dispersing in mid September to early October (Ganey 1988).

Little is known about the reproductive output for the spotted owl. It varies both spatially and temporally (White *et al.* 1995), but the subspecies demonstrates an average annual rate of 1.001 young per pair. There is inadequate data at this time to estimate population trend. Little confidence in initial estimates has been expressed, and is due to its reliance on juvenile survival rates which are believed to be biased low, and due to the insufficient time period over which studies have been conducted.

Based on short-term population and radio-tracking studies, and longer-term monitoring studies, the probability of an adult Mexican spotted owl surviving from one year to the next is 0.8 to 0.9. Juvenile survival is considerably lower at 0.06 to 0.29, although it is believed these estimates may be artificially low due to the high likelihood of permanent dispersal from the study area and the lag of several years before marked juveniles reappear as territory holders and are detected as survivors through recapture efforts (White *et al.* 1995). Little research has been conducted on the causes of mortality of the spotted owl, but predation by great horned owls, northern goshawks, red-tailed hawks, and golden eagles; starvation; and accidents or collisions may all be contributing factors.

Mexican spotted owls nest, roost, forage, and disperse in a diverse array of biotic communities. Nesting habitat is typically in areas with complex forest structure or rocky canyons, and contain mature or old-growth stands which are uneven-aged, multi-storied, and have high canopy closure (Ganey and Balda 1989, USFWS 1991). In the northern portion of the range (southern Utah and Colorado), most nests are in caves or on cliff ledges in steep-walled canyons. Elsewhere, the majority of nests appear to be in Douglas-fir trees (Fletcher and Hollis 1994, Seamans and Gutierrez 1995). A wider variety of tree species is used for roosting; however, Douglas-fir is the most commonly used species (Ganey 1988, Fletcher and Hollis 1994). Foraging owls use a wider variety of forest conditions than for nesting or roosting. In northern Arizona, owls generally foraged slightly more than expected in unlogged forests, and less so in selectively logged forests (Ganey and Balda 1994). However, patterns of habitat use varied among study areas and individual birds, making generalizations difficult.

Seasonal movement patterns of Mexican spotted owls are variable. Some individuals are year-round residents within an area, some remain in the same general area but show shifts in habitat-use patterns, and some migrate considerable distances (20-50 kilometers / 12-31 miles) during the winter, generally migrating to more open habitats at lower elevations (Ganey and Balda 1989, Willey 1993, Ganey *et al.* 1998). Home-range size of Mexican spotted owls appears to vary considerably among habitats and/or geographic areas (USDI 1995), ranging in size from 261 to 1,487 hectares for individual birds, and 381 to 1,551 hectares for pairs (Ganey and Balda 1989). Little is known about habitat use by juveniles during natal dispersal. Ganey *et al.* (1998) found dispersing juveniles in a variety of habitats ranging from high-elevation forests to pinyon-juniper woodlands and riparian areas surrounded by desert grasslands. Some juveniles remained in forests similar to typical owl breeding habitat.

Mexican spotted owls consume a variety of prey throughout their range but commonly eat small and medium sized rodents such as woodrats (*Neotoma* spp.), peromyscid mice, and microtine voles. They may also consume bats, birds, reptiles, and arthropods (Ward and Block 1995). Habitat correlates of the owl's common prey emphasizes that each prey species uses a unique microhabitat. Deer mice (*Peromyscus maniculatus*) are ubiquitous in distribution in comparison to brush mice (*Peromyscus boylei*) which are restricted to drier, rockier substrates, with sparse tree cover. Mexican woodrats (*N. mexicana*) are typically found in areas with considerable shrub or understory tree cover and high log volumes or rocky outcrops. Mexican voles (*Micotus mexicanus*) are associated with high herbaceous cover, primarily grasses; whereas, long-tailed voles (*M. longicaudus*) are found in dense herbaceous cover, primarily forbs, with many shrubs, and limited tree cover. A diverse prey base is dependant on the availability and quality of diverse habitats.

The Mexican Spotted Owl Recovery Plan (USDI 1995) provides for three levels of habitat management: protected areas, restricted areas, and other forest and woodland types. "Protected habitat" includes all known owl sites, and all areas in mixed conifer or pine-oak forests with slopes > 40% where timber harvest has not occurred in the past 20 years, and all reserved lands. "Protected Activity Centers" (PACs) are delineated around known Mexican spotted owl sites. A PAC includes a minimum of 243 hectares (600 acres) designed to include the best nesting and roosting habitat in the area. The recommended size for a PAC includes, on average from available data, 75% of the foraging area of an owl. The management guidelines for protected areas from the recovery plan are to take precedence for activities within protected areas. "Restricted habitat" includes mixed conifer forest, pine-oak forest, and riparian areas; the recovery plan provides less specific management guidelines for these areas. The Recovery Plan provides no owl specific guidelines for "other habitat."

The range of the Mexican spotted owl in the United States has been divided into six recovery units (RUs) as identified in the Recovery Plan (U.S.D.I. 1995, part II.B.). An additional five recovery units were designated in Mexico. The recovery plan identifies recovery criteria by recovery unit. The Upper Gila Mountain Recovery Unit has the greatest known concentration of owl sites in the United States. This unit is considered a critical nucleus for the owl because of its central location within the owl's range, and presence of over 50 percent of the known owls. The other recovery units in the United States, listed in decreasing order of known number of owls, are: Basin and Range-East, Basin and Range-West, Colorado Plateau, Southern Rocky Mountain-New Mexico, and Southern Rocky Mountain-Colorado.

From 1991 through 1997, Gutierrez *et al.* (1997, 1998) studied the demographic characteristics of two Mexican spotted owl populations in the Upper Gila Mountains Recovery Unit. The owl populations studied were located on the Coconino and Gila National Forests. Results of this several-year study have shown a decline in the population trend of Mexican spotted owls within these areas. The reason for the reported decline is unknown. According to Gutierrez *et al.* (1997), such a trend could be a result of: 1) density dependent responses to an increase over carrying capacities; 2) a response to some environmental factor; or 3) senescence. The latter

(i.e. senescence) seems unlikely because there was also a negative linear trend in survival estimates for owls less than three years of age. Regarding carrying capacities, responses to density dependence are difficult to prove in the absence of removal or addition experiments. Environmental factors undoubtedly play a role in owl survival, either through weather events causing direct mortality or indirectly through reduced habitat or prey (Gutierrez *et al.* 1997). This study found that the ability of adult birds to survive successive years of poor environmental conditions may be low (Gutierrez *et al.* 1998).

At the end of the 1995 field season, the Forest Service reported a total of 866 management territories (MTs) established in locations where at least a single MSO had been identified (U.S. Forest Service, *in litt.* November 9, 1995). The information provided at that time also included a summary of territories and acres of suitable habitat in each RU. Subsequently, a summary of all territory and monitoring data for the 1995 field season on Forest Service lands was provided to the Service on January 22, 1996. There were minor discrepancies in the number of MTs reported in the November and January data. For the purposes of this analysis we are using the more recent information. Table 1 displays the number of MTs and percentage of the total number of each Forest (U.S. Forest Service, *in litt.*, January 22, 1996).

Table 1. Number of management territories (MTs) as reported by the Forest Service (U. S. Forest Service, *in litt.*, January 22, 1996), percent of MTs as a proportion of the MTs in Forest Service Region 3, and the percent of suitable habitat surveyed in each Forest by National Forest (Fletcher and Hollis 1994).

National Forest	Number of MTs	Percent of MTs	Percent Suitable Habitat Surveyed
Apache-Sitgreaves	122	14.0	99
Carson	3	0.3	62
Cibola	43	5.0	41
Coconino	155	17.8	87
Coronado	108	12.4	49
Gila	197	22.7	50
Kaibab	6	0.7	96
Lincoln	126	14.5	90
Prescott	10	1.2	42
Santa Fe	33	3.8	44
Tonto	66	7.6	55

TOTAL	869	100	
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The Forest Service has converted some MTs into PACs following the recommendations of the Draft MSO Recovery Plan released in March 1995. The completion of these conversions has typically been driven by project-level consultations with the Service and varies by National Forest.

The Fort Valley 10K is located within the Upper Gila Mountains RU as defined by the MSO Recovery Plan (USDI 1995). This RU is a relatively narrow band bounded on the north by the Colorado Plateau RU and to the south by the Basin and Range West RU. The southern boundary of this RU includes the drainages below the Mogollon Rim in central and eastern Arizona. The eastern boundary extends to the Black, Mimbres, San Mateo, and Magdalena Mountain ranges of New Mexico. The northern and western boundaries extend to the San Francisco Peaks and Bill Williams Mountain north and east of Flagstaff, Arizona. This is a topographically complex area consisting of steep foothills and high plateaus dissected by deep forested drainages. This RU can be considered a "transition zone," because it is an interface between two major biotic regions: the Colorado Plateau and Basin and Range Provinces (Wilson 1969). Habitat within this RU is administered by the Kaibab, Coconino, Apache-Sitgreaves, Tonto, Cibola, and Gila National Forests. The north half of the Fort Apache and northeast corner of the San Carlos Indian Reservations are located in the center of this RU and contain an important habitat link between owl subpopulations at the western and eastern ends of the RU and the subpopulations directly south within the Basin and Range West RU.

This RU consists of deep forested drainages on the Mogollon Plateau. Vegetation generally consists of pinyon/juniper woodland, ponderosa pine/mixed conifer forest, some spruce/fir forest, and deciduous riparian forest in mid and lower elevation canyon habitat. Climate is characterized by cold winters and over half the precipitation falls during the growing season. Much of the mature stand component on the gentle slopes surrounding the canyons has been partially or completely harvested. Most of the forest habitat on steeper ground that may serve as MSO nesting habitat is in suitable condition. MSO are widely distributed and use a variety of habitats within this RU. Owls most commonly nest and roost in mixed-conifer forests dominated by Douglas fir and/or white fir and canyons with varying degrees of forest cover (Ganey and Balda 1989; USDI 1995). Owls also nest and roost in ponderosa pine-Gambel oak forest, where they are typically found in stands containing well-developed understories of Gambel oak (USDI 1995).

This RU contains the largest known concentration of MSO with approximately 55% of known MSO territories (USDI 1995). This RU is located near the center of the MSO's range within the United States and is contiguous to four of the other five RUs within the United States. Because of its central location and its large and relatively continuous spotted owl population, the MSO Recovery Team believes that the population in this RU could be uniquely important

to the overall stability and persistence of the MSO population in the United States. Specifically, this population could serve as the source population, providing immigrants to smaller, more isolated populations in other RUs. Although the Recovery Team has no data on dispersal patterns or movements between RUs, the Recovery Team believes that this population should be maintained at current levels and with at least the current level of connectivity within the RU (USDI 1995). Significant discontinuities that develop in the MSO's distribution within this RU, and the loss of habitat to support the local sub-populations, may compromise the recovery of the species.

ENVIRONMENTAL BASELINE

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

Status of the Mexican Spotted Owl and its Habitat in the Project Area

The Fort Valley 10K project area consists primarily of ponderosa pine forests. The project area contains isolated stands of mixed conifer and aspen, located at the higher elevations. No MSO restricted ponderosa pine/oak habitat is present in the project area. Protected mixed conifer habitat is present within the Orion PAC which is located at the northern edge of the project area.

The Orion Mexican spotted owls were located in 1987. The site was formally monitored by the Forest Service from 1989 to 1993 and has been informally monitored since that time. Over the years, concern was raised over the increasing human use within the Orion PAC (040207), and the impacts the use was having on the owl pair. The increasing use within the PAC consists of dispersed camping and a growing social trail network. The "Secret Trail" and "Moto Trail" both bisect the PAC, as well as numerous other un-named social trails. The "Secret Trail" passes within close proximity to the 1993 nest site and 1994-1997 roost site. These trails were built by recreationists without authorization or designation by the Forest Service. The impacts of increased human use appear to be the frequent movement of the pair to new nesting and roosting sites which in turn, may be affecting nesting success. The pair has not reproduced since 1993. In 1998 it was discovered that the pair had moved approximately 0.75 miles from the historical habitat (1987-1997). The new location of the pair is within habitat which is not suitable for nesting and is an area lacking in suitable nesting platforms due to the young age of Douglas-fir trees. The concern is that the birds have moved due to human disturbance into habitat which will not meet reproductive needs. Based on the new location of

the pair in 1998, the PAC boundaries were modified January 1999, and now include the roost stands. The PAC is currently 765 acres in size (pers. comm. T. Randall-Parker).

The Forest Service has formally consulted on 202 timber sales and other projects in Arizona and New Mexico since August 1993. These projects have resulted in the anticipated incidental take of 124 MSO. In addition, the Bureau of Indian Affairs has consulted on one timber sale on the Navajo Reservation which resulted in an anticipated take of five MSO, and a highway reconstruction which resulted in the anticipated incidental take of two MSO. The Federal Highway Administration has consulted on one highway project that resulted in an undetermined amount of incidental take. The take associated with this action will be determined following further consultation. Additionally, the biological opinion for the Kachina Peaks Wilderness Prescribed Natural Fire (PNF) Plan (#2-21-94-F-220) determined thresholds for incidental take and direct take as follows: 1) one spotted owl or one pair of spotted owl adults and/or associated eggs/juveniles; 2) harm and harassment of spotted owls located in up to two PACs per year; 3) disturbance to spotted owls and habitat modification of a total of seven PACs during the life of the Kachina Burn Plan related to management ignited fire occurring in PACs for which the nest site information is three or more years old; 4) harm and harassment of spotted owls and habitat caused by PNF for which adequate surveys have not been conducted, and; 5) harm and harassment of spotted owls and habitat modification of up to one PAC and 500 acres of potential nest/roost habitat caused by wildfire as an indirect result of PNF during the life of the Kachina Burn Plan.

The Department of the Navy consulted on an observatory project with an anticipated take of one MSO. Consultation with Langley Air Force Base (#2-22-96-F-334) for overflights in both New Mexico and Arizona concerning German Air Force operations at Holloman Air Force Base in New Mexico (for flights over the southern half of New Mexico, southwest Texas, and 40 square miles in eastern Arizona), determined that incidental take of MSO would occur due to harassment. The precise level of the take was impossible to predict due to lack of adequate data. However, incidental take is considered to be exceeded if 5% of monitored PACs are believed to have become nonfunctional through harassment from the overflight. Bandelier National Monument (2-22-95-F-532) consulted on a prescribed fire project with an anticipated direct mortality of one MSO and no more than one PAC buffer area burned.

EFFECTS OF THE ACTION

Recreation--Orion Springs PAC

Recreational activities including camping, hiking, off-road vehicles (ORV), and rock-climbing may affect the MSO depending on location, intensity, frequency, and duration (USDI 1995). Direct effects may occur when these activities impact nests, roosts, and foraging sites. The Recovery Plan indicates that indirect effects may occur when recreational activities degrade

habitat either through vegetation trampling, removal, or accidental burning and soil compaction.

The Recovery Plan provides several recommendations for recreational activities within PACs: no new construction or expansion of existing facilities should occur within a PAC during the breeding season; any construction within a PAC should be considered on a case specific basis; the presence and intensity of allowable recreational activities within PACs should be assessed; and seasonal closures of specifically designated recreational activities should be considered where appropriate.

The Fort Valley preferred alternative B proposes to obliterate portions of the unofficial social trails in the Orion Springs PAC which are of concern ("Secret Trail," "Moto Trail," and other un-named social trails), and re-route users to trails outside of the core area and outside of the PAC itself where possible. This alternative allows portions of the east/west trail, which would become an official Forest Service system trail, to be located within the PAC. Portions of the existing Secret and Moto Trails will be utilized and approximately 1/2 mile of new east/west trail would be built within the PAC to re-route recreationists outside of the nest stand. The exact location of this trail will be determined on the ground with the assistance of the Service. The north/south trail would be built outside of the PAC core area.

Under Alternative B, the Freidlein Prairie Road (FR 522) would remain open. However, camping within and adjacent to the Orion Springs PAC along the Friedlein Prarie Road during the nesting period would be prohibited (March 1- August 31). This nesting period coincides with the dry months of May and June which reduces the risk of human-caused fires. Approximately 7 campsites will be affected by the seasonal camping closure for wildlife habitat protection. Other campsites along the Freidlein Prairie Road will be designated and signed for camping. The restricted camping area will be signed with educational information explaining the sensitivity of the area and rationale for camping restrictions, social trail closures and changes, and ongoing projects to benefit the habitat in the area. Dispersed camping sites will be designated elsewhere along the Friedlein Prairie Road.

The proposed actions as detailed in Alternative B will assist in the reduction of adverse effects to MSO that the Service and Forest Service believe are currently occurring in the Orion Springs PAC. This alternative represents a compromise between the existing condition and total removal of recreation in the PAC and along Freidlien Prairie Road (as proposed in Alternative A). The Service believes full implementation of all aspects of Alternative B designed to reduce impacts to MSO will result in insignificant and discountable effects to the MSO. However, during informal consultation, the Forest Service indicated that although a decision notice will be signed in March 1999, implementation of the closure of the Secret Trail and other social trails, as well as the re-route of the Secret Trail out of the PAC core area will not occur until after the 1999 MSO breeding season. The Forest Service indicates that closure and re-routing will likely occur in the fall of 1999 or the early spring of 2000. The Service believes the existing condition of unofficial social trails within the PAC and core area, as well

as dispersed camping along the Freidlein Prairie Road, will result in adverse effects to the Orion MSO for the 1999 breeding season. Although the Forest Service did not design these trails, the decision not to close them as outlined in Alternative B prior to the 1999 breeding season is a discretionary action, and therefore the effects of this decision must be disclosed during consultation.

The response of wildlife to recreational disturbance is complex, and the effects are not immediately obvious or easily determined (Hammitt and Cole 1987; Flather and Cordell 1995). An understanding of the potential conflicts between recreationists and wildlife has begun to occur in land management as we near the end of the twentieth century (Knight and Gutzwiller 1995). This has been based in large part on the significant increase in wildland recreational activity in the United States. In the 10-year period between 1982 and 1992, day hiking alone in the United States has increased almost two-fold, from 26 million to 50 million (Flather and Cordell 1995). Evidence suggests that recreational activity can harm wildlife (Knight and Cole 1995). Tolerance levels for wildlife interactions with humans will vary by time of year, breeding season, age, habitat type, and individual experience with recreationists (Hammitt and Cole 1987). Human activities can impact wildlife directly through exploitation and disturbance, or indirectly through habitat modification and pollution. The Service's concerns with regards to the Orion Springs PAC include the current and future recreation use and the potential direct effects to the MSO of disturbance and harassment, and to a lesser extent, the indirect effects of prey habitat modification.

There are three learned responses wildlife may show to recreationists: habituation, attraction, and avoidance (Knight and Temple 1995). Recreational disturbance during the breeding season may affect an individual's productivity; disturbance outside the breeding season may affect the individual's energy balance and, therefore, its survival. Birds may respond to disturbance during the breeding season by abandoning their nests or young, by altering their behavior such that they are less attentive to the young, which increases the risk of the young being preyed upon, or by disrupting feeding patterns, or by exposing young to adverse environmental stress (Knight and Cole 1995).

Owls have more sensitive hearing than other birds (Bowles 1995). If a noisy sound source arouses an animal, it has the potential to affect its metabolic rate by making it more active. Increased activity can, in turn, deplete energetic reserves (Bowles 1995). Noisy human activity can cause raptors to expand their home ranges, but often the birds return to normal use patterns when the humans are not present (Bowles 1995). Such expansions in home ranges could affect the fitness of the birds, and thus their ability to successfully reproduce and raise young. Species that are sensitive to the presence of people may be displaced permanently; this may be more detrimental to wildlife than recreation-induced habitat changes (Hammitt and Cole 1987; Gutzwiller 1995; Knight and Cole 1995). If animals are denied access to areas that are essential for reproduction and survival, then that population will decline. Likewise, if animals are disturbed while performing essential behaviors such as foraging or breeding, that population will also likely decline (Knight and Cole 1995). There is also evidence that

disturbance during years of a diminished prey base, of voles for instance, can result in lost foraging time which, in turn, may cause some raptors to leave an area or not to breed at all (Knight and Cole 1995).

There are no completed studies to date on the effects of recreational activities specific to the MSO. Research on all subspecies of the spotted owl indicate that it exhibits docile behavior when approached by researchers, and there is no clear evidence of significant impact by research activity except for a negative effect on reproduction from back-pack radio transmitters (Gutierrez *et al.* 1995). However, researchers purposefully make as little noise as possible, and disturbance is very limited in duration. In the long term, some species may become less responsive to human disturbance if they are not deliberately harassed; others may become very stress-prone towards humans (Bowles 1995; Hammitt and Cole 1987). Excessive interaction with humans may cause a lowering of call response rates or habituation; the effects of habituation on spotted owls is unknown (Gutierrez *et al.* 1995). Owls have been known to begin calling during the breeding season in response to the sound of human voices (personal observation). Such behavior is likely characteristic of a certain percentage of individuals, and this attraction to humans may create a situation where these owls are discovered by hikers, thereby exposing themselves to potential direct impacts.

The MSO Recovery Plan indicates that the determining factor of a recreational activity's impact on spotted owls is a combination of its location, intensity, frequency, and duration. These four factors as they relate to the Orion Springs PAC are discussed below.

The Orion Springs MSO were first found in 1987. They produced young in 1989 and 1990 in the eastern portion of the PAC. In 1991, evidence of the "Secret Trail" was present near the nest tree (pers. comm. T. Randall-Parker). In 1991, the MSO nested at a higher elevation (about 9000 feet); the nest failed and two young were found dead. In 1992 and 1993, the MSO moved westward into another drainage and produced young. The "Secret Trail" was then found to be located proximate to this nest site. Between 1994 and 1997, the MSO pair were located each year in this nest/roost stand, but no nesting was documented. In 1998 it was discovered that the pair had moved approximately 0.75 miles from the historical habitat (1987-1997). The 1998 location of the pair was within habitat which is not believed to be suitable for nesting and lacks suitable nesting platforms due to the young age of Douglas-fir trees.

The "Secret Trail" passes within close proximity (200-300 feet) to the 1993 nest site and 1994-1997 roost site. This trail as well as others in the PAC were built by recreationists without authorization or designation by the Forest Service. The timing of the increased popularity and use of the Secret Trail by hikers and mountain bikers in recent years corresponds to the lack of reproduction and movement by the Orion Springs MSO. The locations of human-wildlife interactions may influence the effects to wildlife. In particular, the presence of humans in key wildlife areas may present major impacts (Hammitt and Cole 1987). It is impossible to prove a direct cause and effect correlation between increased recreational use on the Secret Trail in the

PAC and lack of the owl's reproduction, but the Service finds the evidence highly suggestive. The impacts of increased human use appear to be the frequent movement of the pair to new nesting and roosting sites over a ten year period. This in turn may be affecting nesting success. The concern is that the birds moved in 1998 due to human disturbance into habitat which will not meet reproductive needs.

The Forest Service added acreage to the Orion Springs PAC in 1998 so that all owl locations are included within its boundaries. The existing Secret Trail passes through the center of the PAC and through the 100-acre activity center or core area. The Trail is within the PAC for a distance of about one mile. An additional 2.5 miles of social trails are present within the PAC as well, and 1 mile of official trail (Kachina), as well as 5 unofficial camp sites. Wildlife response to noise varies widely. The Service has consistently recommended a buffer of at least 0.25 miles between disturbing activities and MSO nest/roosts during the breeding season. Because the Orion Springs MSO successfully reproduced at the site proximate to the Secret Trail, and because MSO are known to exhibit site tenacity (Gutierrez *et al.* 1995), it can be assumed that this nest/roost stand presents favorable conditions for nesting and roosting. The 1998 roost location, as stated above, does not provide quality nesting habitat and the Service and Forest Service do not believe MSO will successfully nest at this site. The recreational aspects of Alternative B were designed to eliminate recreational disturbance at and adjacent to the 1993 nest site/1994-1997 roost site, as it is felt that this represents the best nesting habitat in the PAC.

The amount of recreational use on the Secret Trail is unknown. During a 2 hour visit on a weekend, 50 mountain bikes were observed on the Secret Trail and Freidlein Prairie Road (pers. comm. T. Randall-Parker). Site visits conducted by the Service and the Forest Service indicate that the trail is well-used by mountain bikers, contains banks at corners that are typical of high use bike trails, and is cleared of debris by users. The peak recreational period in the area is the summer months when the snow has melted from this higher elevation area. Use varies depending upon snow cover, and in the winter of 1998-1999 use on the trail remains high due to low snowfall. Recreational use overlaps the MSO breeding season which extends from March 1 through August 31. The MSO Recovery Plan (USDI 1995) states that groups of 12 or more recreationists or a steady stream of recreationists occurring in narrow canyon bottoms may be especially disturbing to owls. Again, the Forest Service has no data to indicate the level of use or the frequency of use by groups along the trail. The Service believes the potential for disturbance to MSO in the PAC exists given the current location of the trail relative to nesting habitat and past MSO locations, as well as the anticipated high recreational use levels on the Trail during the MSO breeding season.

In addition to the Secret Trail, dispersed camping occurs within the PAC along the Freidlein Prairie Road. One of these unofficial sites is located immediately adjacent to the Secret Trail and to the 1994-1997 nest/roost site. It is likely that dispersed camping at this site, as well at others nearby, cause disturbance to MSO which may affect their ability to reproduce at this site. In addition, it is evident that human-caused wildfires have started in this area immediately adjacent to nesting habitat which is an additional concern. Camping restrictions in this area,

when implemented, will have the added benefit of reducing the risk of wildlife starting in the PAC. Until restrictions are implemented however, the risk of continued disturbance to MSO in the Orion Springs PAC remains high.

Ecologists suspect that spotted owls select habitats partially because of the availability of prey (USDI 1995). Ward and Block (1995) found that the reproductive success of MSO was not influenced by a single prey species, but rather by many species in combination. Trails affect the soil and vegetation adjacent to the trail. By directly impacting these components, recreationists affect an animal's food supply and availability as well as its habitat; in turn, impacts on food and habitat influence behavior, survival, reproduction, and/or distribution (Cole and Landres 1995). Impacts on soil include compaction of mineral soil, reductions in total porosity, reductions in infiltration rates, and increases in soil erosion (Cole and Landres 1995). These changes in soil characteristics can adversely affect the germination, establishment, growth and reproduction of plants. Direct impacts to vegetation also comes from crushing and uprooting of vegetation. Consequently, recreation areas characteristically have vegetation that is less abundant (reduced density and cover), of a reduced stature, and with different species composition from undisturbed areas (Cole and Landres 1995). Removal of living vegetation effects the habitat and food sources of small mammals; at the same time, human food sources attract rodents and certain species of small mammals and birds (Hammitt and Cole 1987). Therefore, while the effects of vegetation alteration may affect MSO prey negatively, the food brought in by humans may alter species and prey densities.

In summary, effects of recreational use to the Orion Springs MSO are very difficult to quantify, given the lack of recreational use count data and the lack of species-specific studies. Given the past successful reproduction of MSO in the PAC and the location of quality nesting habitat, it is likely that MSO may again attempt to nest in this area if disturbance is reduced or eliminated. The current level of disturbance caused by the Secret Trail and dispersed camping off Freidlien Prairie Road may affect the ability of MSO to nest and successfully reproduce and fledge young. In addition, direct and indirect effects to habitat in the PAC are and will continue to occur due to the Trail location and camping. Effects to this habitat may negatively effect MSO prey species.

The Forest Service indicates that the camping closure and social trail obliterations should be monitored for effectiveness "to the greatest extent possible." The Service believes the effectiveness of the trail obliteration and camping closures are of paramount importance in reducing the adverse impacts of human disturbance to the Orion owls. If the portions of the trails that bisect the nest stand, and the dispersed camping sites within and proximate to the PAC, continue to be used by recreationists, the Service believes adverse effects to the owls will continue, in the form of harm and harassment due to disturbance. This harm and harassment, as it currently exists, appears to be effecting the behavior of the Orion owls as well as reproduction. Failure of the trail closure and camping restrictions will permit such disturbance to continue, thus potentially affecting behavior and reproduction in future years. The Service believes monitoring of these items is very important, as well as instituting measure

to ensure compliance if closures are not effective. If in the future it is found that the trail and camping closures are not working, the Service recommends reinitiation of consultation.

Recreation--Snowbowl PAC

The Snowbowl PAC is located immediately adjacent to the project area. There is at least one social trail in this PAC, but the trail is located outside of the Forest Valley project area and the Forest Service believes its effects to MSO are minimal. The Fort Valley project is not expected to change human use within the Snowbowl PAC.

Silviculture and Prescribed Fire-Orion Springs PAC

No silvicultural or prescribed fire actions are proposed for protected or restricted MSO habitat as defined by the MSO Recovery Plan (USDI 1995). However, five stands immediately adjacent to and within ½ mile the Orion PAC will be treated. These are stands 76/2, 4, 11, 15 and 83/1. These stands consist of “other forest and woodland habitat” as defined in the Recovery Plan. As a PAC size of 600 acres is designed to provide 75 percent of the average home range of MSO, it is likely that owls forage outside of the PAC. The likelihood of owls foraging outside a given PAC probably varies depending upon the accuracy of the PAC boundaries, the habitat quality within the PAC, and behavior of individual owls. The majority of the Orion PAC is situated to the north and east of the five adjacent stands being treated, because this is where locations were concentrated between 1987-1997. However, the 1998 pair location is in the western portion of the PAC and is between 1/4 and ½ mile from the treatment stands. If the owls continue to use the stands in this portion of the PAC, it is more likely that they may forage in the adjacent stands.

The treatment of four of the five adjacent stands will consist of the Retention of Dense Tree Canopy prescription. The treatment of stand 83/1 is Full/Modified Restoration Thinning. According to the project description, stands treated with the Retention of Dense Tree Canopy prescription will maintain a canopy closure at or above 60%. This treatment is likely to result in canopy conditions in which MSO could continue to forage. Treatment of stand 83/1 with the Full/Modified Restoration Thinning will result in a basal area of approximately 50 square feet. This is likely to consist of approximately 6 to 8 trees per acre. It is unlikely that MSO would forage in this stand due to its resulting open canopy.

In addition to silvicultural treatments, these five stands will also be burned at intervals of 3 to 5 years for a period of 10 years. This burning may occur during the MSO breeding season. Burning adjacent to the PAC is of concern due to smoke and the risk of fire entering the PAC and resulting in habitat loss. Smoke is of concern as it may cause disturbance to the owls and young if conducted during the breeding season, particularly if an inversion is created which keeps smoke in a PAC for a period of time. The Forest Service states that smoke is anticipated to be within the PAC for a period of one day when the initial ignition takes place. The smoke is anticipated to be in the PAC for this one day and be gone by evenings with little or no

inversion. Stumps and logs in the adjacent stands could smoulder for several days and continue to put minimal amounts of smoke into the PAC. Fire line will be constructed outside of the PAC, or existing roads will be used to exclude fire from the PAC. Any burning which occurs during the MSO breeding season will be coordinated with a Peaks Ranger District wildlife biologist so that implementation of fire line construction and burning will be conducted in a manner to cause no effects to the Orion PAC.

The proposed prescribed burning in the stands adjacent to the Orion PAC is expected to impact existing snags. To mitigate potential impacts, large snags will be lined. However, based on monitoring (Miller and Randall-Parker 1998) approximately 1/5 (20%) of existing snags could be lost. Snags gained (yellow pines converted to snags) from prescribed fire have been minimal (less than 1%) based on this same monitoring effort. Mitigation for the proposed action includes the creation of snags. Snags will be created to replace large snags lost from prescribed fire. The most effective snag-creating techniques are those which killed ponderosa pines from the top down. Other techniques such as basal burning and girdling, which killed the tree from the base, resulted in snags which stood for only short periods of time. The following techniques may be used for creating snags: (1) using fungal agents to kill trees, (2) using explosives to blow out the tops of the trees, and (3) topping trees with a chainsaw. This mitigation serves only to replace large snags lost in prescribed burning.

Prescribed fire will have the most impact on logs in the five adjacent stands. Fire has the potential to reduce logs by 1/2 (Miller and Randall-Parker 1998). The Forest Service indicates that log lining has not been effective as observed in other places and is not recommended. Less than 1/3 of the acres will provide greater than 3 logs per acre following prescribed burn treatments, which may result in reduced habitat for species which utilize this component for cover and food. Higher fuel moistures in the larger logs might prevent the high level of loss. The Forest Service indicated that prescribed burning that occurs in the spring and summer will assist in reducing large log loss, and is therefore likely to be more beneficial to species that depend upon small mammals.

Silviculture and Prescribed Fire--Snowbowl PAC

Nest sites within the Snowbowl PAC are located approximately 1/2 to 3/4 of a mile from the Fort Valley 10K project area. Prescribed fire in the project area may occur during the breeding season, but this PAC is located northwest of the potential airflow of prescribed burns, thus is not expected to disturb nesting MSO in this PAC. Silvicultural treatments are proposed adjacent to the PAC boundary in ponderosa pine habitat. These areas are potential foraging habitat and the proposed treatments will likely lessen their suitability for foraging.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions are subject to the consultation requirements established under section 7, and, therefore, are not considered cumulative in the proposed action. In past Biological Opinions, it has been stated that, “Because of the predominant occurrences of MSO 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, there has been a recent increase of harvest activities on non-Federal lands within the range of the MSO. In addition, future actions within or adjacent to the project area that are reasonably certain to occur include urban development, road building and widening, land clearing, trail construction, and other associated actions. These activities have the potential to reduce the quality of MSO nesting, roosting, and foraging habitat, and cause disturbance to breeding MSO, and would contribute as cumulative effects to the proposed action.

CONCLUSION

After reviewing the current status of the Mexican spotted owl, the environmental baseline for the action area, the effects of the proposed actions, and the cumulative effects, it is the Service's biological opinion that the Fort Valley 10K as proposed, is not likely to jeopardize the continued existence of the MSO. Designated critical habitat for this species has been revoked, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

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 to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by FWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The agency has a continuing duty to regulate the activity covered by this incidental take statement. If the agency (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the agency or applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

For the purposes of consideration of incidental take of MSO from the proposed action under consultation, incidental take can be broadly defined as either the direct mortality of individual birds, or the alteration of habitat that affects the behavior (i.e. breeding or foraging) of birds to such a degree that the birds are considered lost as viable members of the population and thus “taken.” They may fail to breed, fail to successfully rear young, raise less fit young, or desert the area because of disturbance or because habitat no longer meets the owl’s needs.

In past Biological Opinions, the management territory was used to quantify incidental take thresholds for MSO (see Biological Opinions provided by the Service to the Forest Service from August 23, 1993 through 1995). The current section 7 consultation policy provides for incidental take if an activity compromises the integrity of a PAC. Actions outside PACs will generally not be considered incidental take, except in cases when area that may support owls have not been adequately surveyed.

Amount or extent of take

The Service anticipates that two adult spotted owls (one pair) and/or associated eggs/juveniles could be taken during the 1999 breeding season associated with the Orion Springs PAC (040207), as a result of continued recreational use on the Secret, Moto, and other trails within the PAC and core area, and as a result of dispersed camping along the Freidlein Prairie Road within and adjacent to the Orion Springs PAC. The incidental take of the adult birds would be in the form of harassment. Incidental take of the eggs/juveniles would include both harassment and mortality. The Service believes the action of allowing the continued high levels of recreational use in the Orion Springs PAC would result in harassment of adult and juvenile owls by allowing noise disturbance during the breeding season. This disturbance may also result in mortality of juvenile birds. The Service anticipates that incidental take of MSO will be difficult to detect because take in the form of harassment is as a result of activities that significantly disrupt or impair normal behavioral patterns. Any incident of harassment is likely to be of limited extent and intensity, and therefore difficult to distinguish from normal behavior and difficult to document. The Service concludes that incidental take from the proposed action will be considered to be exceeded if any of the following conditions are met:

1. Trail and campsite closures and re-routing of trails within the Orion Springs PAC is not completed by March 2000.
2. Required monitoring of MSO and recreational use within the Orion Spring PAC is not completed and reported to the Service as scheduled.

If, during project activities, the amount of extent of take is exceeded, the Forest Service must reinitiate consultation with the Service immediately to avoid violation of section 9. Operations must be stopped in the interim period between the initiation and completion of the new consultation if it is determined that the impact of the additional taking will cause an irreversible or adverse impact on the species, as required by 50 CFR 402.14(i). An explanation of the causes of the taking will be provided to the Service.

Effect of the take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

Reasonable and prudent measures

Regulations (50 CFR §402.02) implementing section 7 of the Act define reasonable and prudent alternatives as alternative actions, identified during formal consultation, that: (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the action agency's legal authority and jurisdiction; (3) are economically and technologically feasible; and (4) would, the Service believes, avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

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

1. The Forest Service shall minimize direct and indirect effects of visitor use to the MSO and its habitat in the Orion Springs PAC to the maximum extent possible.
2. The Forest Service shall gather information on recreational use and MSO within the Orion Springs PAC to assist in reducing impact to the owl.

Terms and conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Forest Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions are necessary to implement the reasonable and prudent measures.

Terms and conditions to implement reasonable and prudent measure 1:

- 1.1 Complete all trail closures and re-routing of trails within the Orion Springs PAC prior to March 2000.
- 1.2 Complete seasonal closures of dispersed camp sites along Freidlein Prairie Road within and adjacent to the Orion Springs PAC prior to March 2000.
- 1.3 By March 15, 2000, report to the Service the status of trail and campsite closures.

Terms and conditions to implement reasonable and prudent measure 2:

- 2.1 The Forest Service shall monitor human day use along the Secret Trail and dispersed camping off the Freidlein Prairie Road within the Orion Springs PAC during the 1999 MSO breeding season. Monitoring will be conducted at least once a month (March through August) between sunrise and sunset during days of expected high trail and camping use (weekends, holidays). Information gathered will include at least the following parameters: number of visitors and party size.
- 2.2 The Forest Service shall monitor MSO in the Orion Springs PAC in 1999 to attempt to determine reproductive status and location of MSO.
- 2.3 The Forest Service shall provide the results of recreation use and MSO monitoring to the Service by the end of the 1999 calendar year.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than one pair of spotted owls and/or their associated young associated with the Orion PAC (040207) will be incidentally taken. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Forest Service must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Fish and Wildlife Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

DISPOSITION OF DEAD, INJURED, OR SICK SPOTTED OWLS

Upon locating a dead, injured, or sick spotted owl, initial notification must be made to the Service's Law Enforcement Office, Federal Building, Room 8, 26 North McDonald, Mesa, Arizona (telephone: 602/835-8289) within three working days of its finding. Written notification must be made within five calendar days and should include the date, time, and location of the animal, a photograph, if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling specimens to preserve the biological material in the set possible state. If possible, the remains of intact owl(s) shall be provided to this office. If the remains of the owl(s) are not intact or are not collected, the information noted above shall be obtained and the carcass left in place. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should the treated owl(s) survive, the Service should be contacted regarding the final disposition of the animal.

CONSERVATION RECOMMENDATIONS

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

1. Develop and initiate studies to gain a comprehensive understanding of how recreation affects the Mexican spotted owl and its ability to reproduce.

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

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the this biological opinion. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently

modified in a manner that causes an effect to the listed species or critical habitat 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 instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The Service appreciates your consideration of threatened and endangered species in amendment development. For further information, please contact Michele James (520-527-3042) or Bruce Palmer (x237). Please refer to the consultation number 2-21-96-F-059 in future correspondence concerning this project.

Sincerely,

/s/ David L. Harlow
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (GARD-AZ/NM)
Field Supervisor, Fish and Wildlife Service, New Mexico Field Office, Albuquerque, NM
Forest Biologist, Coconino National Forest, Flagstaff, AZ (attn: Cecilia Dargan)

Director, Arizona Game and Fish Department, Phoenix, AZ

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