

2-21-01-F-254

SUMMARY: BIOLOGICAL OPINION: LITTLE PICKET AND MADRONE PRESCRIBED FIRE PROJECT

Date of Opinion: October 5, 2001

Action Agency: National Park Service: Chiricahua National Monument and Fort Bowie National Historic Site, Willcox, Arizona.

Project: The Chiricahua National Monument (CNM) proposes prescribed fire in a mosaic pattern to be used over 2,856 acres in the Little Picket and Madrone burn units. The CNM is on the east flank of the northern part of the Chiricahua Mountains in Cochise County, Arizona. The ignitions will occur in two specific areas, at separate times of the year, with personnel shepherding fire across designated Maximum Management Areas (MMAs) if it is burning according to designated parameters in the burn plan.

Listed/Proposed Species and Critical Habitat Affected: Lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*) (LLNB). The CNM requested concurrence with their determination that the proposed action is not likely to adversely affect the Mexican spotted owl (*Strix occidentalis lucida*) (MSO).

Biological/Conference Opinion: The Service determined that effects from the proposed action are not likely to jeopardize the continued existence of the LLNB, and not likely to adversely affect the MSO.

Incidental Take Statement:

Level of take anticipated: Take in the form of acres of reduced food resources is anticipated for the LLNB.

Reasonable and Prudent Measures: The biological opinion presents several measures for reducing incidental take. The most important measures are adopted from the CNM's proposed action. Implementation of these measures through the terms and conditions is mandatory.

Terms and Conditions: Mandatory terms and conditions are included for all species to implement the reasonable and prudent measures. They include measures to reduce incidental take such as modifying actions that result in take of individual animals, careful implementation of the prescribed fire, having a Resource Advisor on site and education of project personnel, and monitoring of take and habitat loss.

Conservation Recommendations: Conservation measures are recommended for LLNB. Suggested measures include implementation of recovery tasks, clarification of a species range or distribution, further studies into the effects of fire, and other related matters.

United States Department of the Interior

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In Reply Refer To:

AESO/SE

2-21-01-F-254

October 4, 2001

Memorandum

To: Superintendent, Chiricahua National Monument and Fort Bowie National Historic Site

From: Field Supervisor

Subject: Little Picket and Madrone Prescribed Fire Project

This memorandum responds to your March 20, 2001, letter and biological evaluation (received April 2, 2001), and your August 16, 2001, letter requesting consultation, pursuant to section 7 of the Endangered Species Act of 1973, as amended, on effects from the Little Picket and Madrone Prescribed Fire Project on the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*) (LLNB). You also requested concurrence that the proposed project actions are not likely to adversely affect the threatened Mexican spotted owl (*Strix occidentalis lucida*) (MSO). We concur with your determination and provide our rationale in Appendix A of this document. Critical habitat is not designated for the LLNB; therefore, none will be affected. Critical habitat has been designated for the MSO (February 1, 2001), but this project will not occur in or affect MSO critical habitat located in the Chiricahua National Monument (CNM).

This biological opinion (BO) was prepared using information from your March 20, 2000, request for consultation, the accompanying biological evaluation and accompanying appendixes (burn plan), several electronic and telephone conversations, site visits, and our files. Literature cited in this biological opinion is not a complete bibliography of all literature available on the affected species, nor is it a complete review of the effects of prescribed fire on these species. A complete administrative record of this consultation is on file in our Phoenix office.

CONSULTATION HISTORY

The U.S. Fish and Wildlife Service (Service) received your March 20, 2001, letter requesting consultation for the Little Picket and Madrone Prescribed Fire Project. The biological evaluation (BE) and a burn plan were attached and reviewed by the Service. After some telephone discussion between the CNM and the Service regarding prescribed fire effects of agave in the proposed burn units and LLNB, the CNM sent the Service a letter dated August 16, 2001, requesting formal consultation on the LLNB due to possible adverse effects to agave. The Service received that letter August 20, 2001.

BIOLOGICAL OPINION

Between June 15, 2001 and November 30, 2001, CNM plans to ignite 389 acres in the Little Picket burn unit (see BE, Figure 1). Between August 15, 2001 and March 1, 2002, CNM plans to ignite 222 acres in the Madrone burn unit (see BE, Figure 2). These two areas are direct ignition targets; fire is ignited in these areas only. These target areas are surrounded by lands designated as the Maximum Management Areas (MMAs). MMAs are lands outside the target area where fire is not directly ignited, but where fire from the target area is allowed to burn under the prescription described in the accompanying Burn Plan (see BE, Appendix).

MMAs provide increased firefighter protection (blacklines and safety zones), lower suppression costs, and create a mosaic of scattered burned and unburned patches of habitat over the landscape. The MMAs were selected with strategic topographic features and fuel conditions in mind to facilitate firefighter safety and project results. The MMA for Little Picket is 996 acres and the MMA for Madrone is 1,249 acres. The entire project encompasses 2,856 total acres, but about one-third of the acres are not expected to burn due to patchily distributed fuels, differing vegetation types (some areas will not burn under the described low-intensity fire prescription), and rocky areas scattered throughout the project area.

Little Picket (target and MMA) contains the 41 percent grass vegetation community, 54 percent manzanita and scrub oak, and five percent oak/conifer. Madrone (target and MMA) contains two percent grass, 80 percent manzanita and scrub oak, and 18 percent oak/conifer. Fuel loads vary throughout the burn units, with fuel loadings as high as 16 tons per acre in the manzanita communities and 0.74 tons per acre in the grasslands.

This project is expected to reduce the risk of catastrophic wildfire by reducing the high level of hazardous fuel loads in the CNM. Elements at risk include telephone lines, campgrounds, current and historic buildings, cultural sites, and threatened and endangered species and habitat.

Firelines will be scraped around potential wildlife trees, snags, and trees with existing fire scars for greater protection. Direct ignition (within the target area only) will utilize drip torches and fusees, and the blacklining method will be strip head firing. Some trees (all less than nine inches in diameter) are expected to be cut for blacklining. Firefighters will blackline in the afternoon and evening hours along the dry, rocky pathways and dry creekbeds (no trees), cliff faces, and other natural fuel breaks. Ignition objectives include creating a low to moderate intensity surface fire to reduce live and dead fuel loadings and hinder brush encroachment into woodlands and grasslands.

If there is an escaped fire situation, ignition will immediately cease. All available resources will conduct initial attack on the escaped fire. If suppression action by the available forces is insufficient to control that fire, it will be declared a wildland fire and the Service will be immediately notified. Hydrants and hoses are available in the headquarters area to the south of the Madrone burn area to assist with suppression if the fire escapes in that direction. A

helicopter with bucket capability will be available from within one hour to assist with suppression. Additional resources will be available, primarily from the United States Forest Service (Forest Service), the Douglas Ranger District, and Bureau of Land Management (BLM) Safford Office. Chief of Resources Management, Alan Whalon, will be on duty during these burns as Resource Advisor to assure that operations are compatible with resource needs, including listed species and their habitat.

Post-burn data 1996 to 2000 on 19 forest plots were used to determine the probable results of prescribed burning on the vegetation types in the project area. The data reveal an eight percent decline in the number of trees that contribute to the overstory (regardless of diameter breast height or dbh), a one percent increase in basal area (square feet per acre) of remaining trees that contribute to the overstory, a four percent increase in average tree dbh, and a two percent increase in native grasses and forbs as ground cover. Prescribed burning did not significantly alter forest structure and composition. Fire effects monitoring plots will be installed in both burn units to be read pre- and post-burn (2001 to 2006) for more data. Results will be reported to the Service annually.

Proposed minimization measures for the project include:

1. Monitoring fire effects on agave through pre- and post-burn plots in appropriate areas. Plots will be read for five consecutive years. Results will be reported annually to the Service.
2. Implementing the proposed action will include use of Best Management Practices and strict adherence to the burn plan.
3. Avoiding intense fire on sensitive soils, which may promote water repellence, nutrient leaching, and erosion.
4. Retaining sufficient ground cover to prevent erosion of burned sites on a large-scale basis.
5. Reducing fuel loads in elevations lying below MSO PAC boundaries.
6. Livestock grazing will not occur in the burned areas.

Lesser long-nosed bat (LLNB)

The lesser long-nosed bat (originally, as *Leptonycteris sanborni*; Sanborn's long-nosed bat) was listed as endangered on September 30, 1988 (53 FR 38456)(USFWS 1988). Critical habitat has not been designated for this species. The lesser long-nosed bat is a small, leaf-nosed bat. It has a long muzzle and a long tongue, and is capable of hover flight. These features are adaptations to feed on nectar from the flowers of columnar cactus, such as the saguaro and organ pipe cactus and from paniculate agaves, such as Palmer's agave, *Agave palmeri*, and Parry's agave, *A. parryi* (Hoffmeister 1986). Palmer's agave exhibit many characteristics of chiropterophily, such as nocturnal pollen dehiscence and nectar production, light colored and erect flowers, strong floral

order, and high levels of pollen protein with relatively low levels of nectar sugar concentrations (Slauson 1996). Parry's agave demonstrates many (though not all) of these same morphological features (Gentry 1982).

The lesser long-nosed bat is migratory and found throughout its historic range, from southern Arizona and extreme southwestern New Mexico, through western Mexico, and south to El Salvador. It has been recorded in southern Arizona from the Picacho Mountains (Pinal County) southwest to the Agua Dulce Mountains (Pima County), southeast to the Chiricahua Mountains (Cochise County), and south to the international boundary. Roosts in Arizona are typically occupied from as early as late April to as late as early October (Cockrum and Petryszyn 1991, Sidner 1999); the bat has only rarely been recorded outside of this time period in Arizona (Fleming 1995, Hoffmeister 1986). In spring, adult females, most of which are pregnant, arrive in Arizona gathering into maternity colonies. These roosts are typically at low elevations near concentrations of flowering columnar cacti. After the young are weaned these colonies disband in July and August; some females and young move to higher elevations, primarily in the southeastern parts of Arizona near concentrations of blooming paniculate agaves. Adult males typically occupy separate roosts forming bachelor colonies. Males are known mostly from the Chiricahua Mountains but also occur with adult females and young of the year at maternity sites (Fleming 1995). Throughout the night between foraging bouts both sexes will rest in temporary night roosts (Hoffmeister 1986).

The LLNB consumes nectar and pollen of paniculate agave flowers and the nectar, pollen, and fruit produced by a variety of columnar cacti. These bats often forage in flocks. Nectar of these cacti and agaves are high energy foods. Concentrations of some food resources appear to be patchily distributed on the landscape and the nectar of each plant species utilized is only seasonally available. Cacti flowers and fruit are available during the spring and early summer; blooming agaves are available primarily from July through October. Columnar cacti occur in lower elevation areas of the Sonoran Desert region, and paniculate agaves are found primarily in higher elevation desert scrub areas, desert grasslands and shrublands, and into the oak woodland (Gentry 1982). In the Huachuca Mountains, Parry's agave is generally found at higher elevations than Palmer's agave; the former is common in forest openings to the crest of the Huachuca Mountains.

Lesser long-nosed bats are opportunistic foragers and efficient fliers. Seasonally available food resources may account for the seasonal movement patterns of the bat. LLNB are known to fly long distances from roost sites to foraging sites. Night flights from maternity colonies to flowering columnar cacti have been documented in Arizona at 15 miles, and in Mexico at 25 miles and 38 miles (one way) (Dalton et al. 1994). Fleming (1995) suggests that a substantial portion of the lesser long-nosed bats at the Pinacate Cave in Sonora fly 25 to 31 miles each night to foraging areas in Organ Pipe Cactus National Monument. Horner et al. (1990) found that lesser long-nosed bats commuted 15.5 miles between an island maternity roost and the mainland in Sonora. The authors suggested that bats regularly flew at least 47 miles each night.

Ober et al (2000) studied foraging ecology of the LLNB on Fort Huachuca, Arizona, and found the high energy demands of the bat, coupled with the small amount of nectar per flower, forces bats to visit many flowers each night. The daily energy use may be as high as one and one-half to two times higher than previously reported. The amount of food needed to support the southeastern LLNB population may be much higher than previously thought. Maintaining sufficient numbers of food sources is very important to the bat population. Ober et al estimated that one *A. palmeri* produces enough nectar to support 1.5 bats throughout the time they are in southeastern Arizona. They found evidence that bats select areas with both high resource abundance and evidence of high resource abundance in previous years, suggesting site fidelity may play a role in the bat's foraging behavior. A reduction in, or a fragmentation of, *A. palmeri* populations could have serious effects on bat behavior, forcing them to fly farther, expend more energy, roost in substandard sites, or compete with each other for food at remaining plants. These negative effects would be somewhat masked in good years, but be more substantial in years of low flower production.

Other potential threats to the lesser long-nosed bat are excess harvesting of agaves in Mexico, the collection of cacti in the United States, and the conversion of LLNB foraging habitat for agricultural uses. Livestock grazing, wood-cutting, and other human development activities may contribute to the decline of long-nosed bat populations. Widmer is studying the effects of livestock grazing on *A. palmeri*. Her preliminary results (2000) were: 1) overall herbivory on agave stalks was 56 percent, 2) one-third of emerging inflorescences were grazed at 70 percent of the sites, and 3) herbivory on agave stalks was 29 percent greater at sites grazed by livestock during the agave bolting season. Other livestock grazing effects can be soil compaction, trampling of young agave, watershed changes, reduction of grasses (and reduction of fire), and erosion potential. Study of these and other livestock grazing effects would aid in more fully determining effects of livestock grazing to the species.

Loss of roost and foraging habitat, as well as direct taking of individual bats during animal control programs, particularly in Mexico, have contributed to the current endangered status of the species. Suitable day roosts and suitable concentrations of food plants are the two resources that are crucial for the lesser long-nosed bat (Fleming 1995). Caves and mines are used as day roosts. The factors that make roost sites useable have not yet been identified, but LLNB appears to be sensitive to human disturbance. Instances are known where a single brief visit to an occupied roost is sufficient to cause a high proportion of lesser long-nosed bats to temporarily abandon their day roost and move to another. Perhaps most disturbed bats return to their preferred roost in a few days; however, this sensitivity suggests that the presence of alternate roost sites may be critical when disturbance occurs. Interspecific interactions with other bat species may also influence LLNB roost requirements.

Known major roost sites include 16 large roosts in Arizona and Mexico (Fleming 1995). According to surveys conducted in 1992 and 1993, the number of bats estimated to occupy these sites was greater than 200,000. Twelve major maternity roost sites are known from Arizona and Mexico. According to the same surveys, the maternity roosts are occupied by over 150,000 LLNBs. The numbers above indicate that although a relatively large number of these bats are

known to exist, the relative number of known large roosts is small. Disturbance of these roosts and the food plants associated with them could lead to the loss of the roosts. Limited numbers of maternity roosts may be the critical factor in the survival of this species.

ENVIRONMENTAL BASELINE

No roosts have been located within the project area or within the CNM boundaries. The nearest large (greater than 1,000 bats) LLNB roost known is the Keyser Mine Tunnel (T16S, R30E, Sec 33), about two miles east of the southeastern corner of the CNM. Another large roost is known to be seven miles east of the CNM (at a lower elevation on private land), and a third, smaller roost is known to be six miles north of CNM at the very northern end of the Chiricahua Mountains (AGFD 2001).

Lesser long-nosed bats require suitable forage plants. At and near the project area, forage plants include Palmer's agave and possibly Parry's agave. Palmer's agave (nectar and fruits) is the most important food resource for LLNB at the lower elevations, such as in the project area. Agave in grasslands and savannas have evolved with fire. They are typically found in open areas and slopes in lower sites and in forest openings at higher elevation. Invasion of mesquite, oak, and juniper into grassland areas as a result of reduced fire frequency may reduce potential habitat for agaves through shading. Alternatively, high fire frequency can lead to decline or elimination of agave populations (Howell 1996).

The CNM conducted monument-wide LLNB surveys in 1994, 1998, and 2000. Surveys included close physical inspections of alcoves, rock overhangs, and ledges in the burn units; no caves or mines occur within these units. Mist-netting operations were conducted in August 2000 at several pools (near structures, a campground, and the Natural Arch trailhead). Out of a total of 15 bat species captured, two were LLNB. One flowering agave near the campground was watched at night by biologists with night-vision equipment; it sustained 1,700 "hits" (visits) by nectar-feeding bats (most likely LLNB); another agave under observation sustained 1,900 hits. The CNM will continue to submit LLNB information to the Arizona Game and Fish Department (AGFD) Heritage Data Management System (HDMS) and the Service, will limit agave mortality in the burn units to less than 20 percent, will re-verify probable roost sites in the burn units for LLNB in 2001, and prepare a programmatic long-range fire plan for the CNM for future consultation.

The two burn units contain dense shrubby vegetation with scattered pockets of grasslands that may contain agave plants. No columnar cactus plants occur in, or anywhere near, the project area. The Little Picket burn unit also contains scattered Palmer agave in the grasslands at the lower elevations along the western boundary of the project and on the south-facing slopes. There are far greater (in the hundreds of thousands) numbers and concentrations of this plant all along the western slopes of the monument, the Chiricahua and Dos Cabezas Mountains, and on private land adjacent to the CNM.

The Newton burn conducted in 1998 showed similar topographic features and vegetation communities in the same general aspects and slopes as the proposed project. Results measured two months after the Newton burn showed 11.3 percent of the burned-over agave plants appeared dead, with mortality varying according to size class and density of Lehmann lovegrass (*Eragrostis lehmanniana*) surrounding individual plants. After one year, post-burn data showed the actual mortality of agaves to be 2.2 percent. This strong difference is likely due to the difficulty in determining live vs. dead agave immediately post-burn. Agave mortality in the 1999 Little Niagara burn, two months post-burn, was about six percent. Monitoring by the U.S. Forest Service (Forest Service) in the Peloncillo Mountains for the 1996-1997 Maverick prescribed burn shows a similar range of agave mortality (USFWS 1999).

A prior fire project, the Baker Prescribed Fire, was conducted in the southern Peloncillo Mountains in extreme southeastern Arizona and southwestern New Mexico. According to preliminary monitoring efforts conducted after the fire, between seven and 11 percent mortality of Palmer's agaves occurred in those agave exposed to fire (USFWS 1999). Additional mortality may occur through the loss of the smallest and least-easily detectable size classes of agave. On the Maverick Prescribed Fire, also in the Peloncillo Mountains, less than five percent of agaves in burned areas were killed by the fire. Partly because of a mosaic of burned and unburned areas, overall mortality in the project area was less than one percent. Thomas and Goodson (1992) reported an average mortality of 28 percent of five species of leaf succulents from nine burned sites in southern Arizona. Palmer's agave mortality averaged 18 percent. In this case, post-fire grazing may have influenced reported mortality. Concentrations of paniculate agaves are primarily on the rocky, shallow soils of hills and ridges, particularly on southerly and southeasterly facing slopes. Other Palmer's and Parry's agaves are found scattered in areas of deep, heavy soils where thick stands of shrubs and mesquite form heavy fuel loads. The relative fuel loading and potential exposure of agaves to intense fire is lower on rocky soils.

There is a relatively small amount of mature agave within the burn units when compared to the hundreds of thousands of agave available in the CNM and surrounding landscape of southeastern Arizona. A first-year reduction in native grasses is expected post-burn, and Lehmann's lovegrass is not known to occupy the burn units. Fires that occur after this project will be less intense and cooler, further minimizing agave mortality. There are no known large roost sites in the burn units or on the CNM, but at least three known large LLNB roost sites exist within 40 miles of the CNM, and it appears LLNB feed on agave in CNM on a regular basis.

EFFECTS OF THE PROPOSED ACTION

The LLNB is most sensitive to activities that might adversely affect roost sites. No known roosts occur in the action area, although three roosts (large) are known within several miles. Lesser long-nosed bats are not present during February and March or in the fall, and do not arrive in the general area until late July or August. Direct effects to LLNB are unlikely to occur due to this project.

Prescribed fire will affect some agave, depending on the density of grasses and forbs surrounding individual plants and the burning intensities of the fire as it passes through the burn units. Most Palmer's agave in the burn units are located on rocky, bare-soil areas, and a vast majority in the project area are expected to escape intense fire effects.

It is unknown if forage resources are limiting to LLNB populations in the Chiricahua Mountains. This has not yet been adequately tested through research. If forage resources are limiting, it could be expected that in some years or in some areas, numbers of bats may be reduced, or bats may have to fly farther from their roosts to obtain sufficient food. Bats that fly greater distances are probably more vulnerable to predation or accidental death. Under a scenario of limiting food resources, damage or death of agaves due to prescribed fire could conceivably further reduce forage resources and bat numbers. Although the question of whether agaves are limiting to lesser long-nosed bats is unanswered, it seems likely that landscape-scale projects, such as a prescribed fire, that are adjacent to large or important roosts will have some effects on bat foraging behavior, and some of these are likely to be adverse effects. The Service considers loss of forage resources a great enough threat to include protection of foraging areas and food plants as a priority 1 task in the LLNB Recovery Plan (USFWS 1997).

Agave mortality due to fire may affect the abundance and distribution of blooming agaves on the landscape for many years into the future, especially if there is high mortality within certain age/size classes (e.g seedlings). Natural recruitment of agave may be very episodic and the effects of fire on the agave seed bank in the soil are unknown. Often one of the objectives of prescribed fire is to increase abundance of grasses. Grasses are probably one of the strongest competitors with agave seedlings (USFWS 1999). Increased abundance of grass could result in reduced agave abundance. Agave stalks, as they begin to bolt, are particularly palatable to domestic livestock and wild herbivores, including deer, javelina, rodents, and rabbits (USFWS 1999). Since agave often remain partially green, succulent, and available to herbivores when food resources are low immediately following a fire, they may be preferentially selected by herbivores. This may in turn affect the availability of agave flowering stalks to bats.

Besides direct mortality of agaves, fire may alter the availability of blooming agaves. By early spring, an agave plant would have physiologically committed to bolt (send up a flowering stalk). If the plant is burned and lives, bolting continues even though the flower stalk is smaller with fewer flowers (Howell 1996, USFWS 1999). If the stalk burns directly, the reproductive effort of that plant and the availability of flowers and nectar to LLNB has been lost. Although the availability of blooming agaves may be affected by fire, the nectar production and sugar content of surviving plants is little affected. Working in the Peloncillo Mountains, Slauson (USFWS 1999) found that nectar production and sugar content did not differ between unburned agaves and burned agaves that did not have greater than 80 to 90 percent of the leaf area burned. The complexity of variables influencing agave flowering may mask the effects of a burn on agave flowering within several years of a fire.

Reintroducing fire into fire-adapted communities, such as desert grassland and oak/juniper savanna systems, can also have many benefits and may improve overall long-term "ecosystem management" objectives. Among these is the reduction of woody fuels resulting in decreased probability of intense fires and resulting erosion, soil sterilization, and increased plant mortality. Ultimately, if fire continues to be excluded from fire-adapted systems a major wildfire will occur with potentially devastating effects. Returning to a more natural regime of low-intensity fires would help to maintain a mosaic of grasslands, woodlands, and shrublands across the landscape and may enhance refugia in which fuel loads and the chances of damaging fires are low. However, even under a prescribed fire regime there are potential adverse effects of fire to forage plants that may affect resource availability for the LLNB.

Activities that directly or indirectly promote invasion or increased density of nonnative grasses, particularly Lehmann lovegrass, may result in increased fire frequency or intensity, reduced densities of Palmer's agave, and thus reduced forage resources for the lesser long-nosed bat. Lehmann lovegrass has been planted on the mesa tops in the project area in years past where it coexists with native grasses.

The importance of Parry's agave stands in the Chiricahua Mountains as a forage resource for LLNB is unknown. Parry's agave generally occurs at higher elevation than Palmer's agave, and occurs in forest openings throughout the Chiricahua Mountains to the mountain's crest. Benson and Darrow (1982) noted Parry's typically flowers in June and early July, which is before the LLNB arrives at roosts outside the CNM. Parry's agave may be in bloom at a later time than those agave at lower elevation sites, thus potentially available for LLNB when they arrive in July or early August.

The only significant threat to stands of agaves in the forested portions of the Chiricahua Mountains is wildfire. Fuel loads are high in some portions of the Chiricahua Mountains, and a stand-replacing, catastrophic-effects wildfire could occur due to lightning strikes, a careless human, or other causes. Because Parry's agave occurs primarily in openings and often on rocky slopes where fuel loads are relatively light, agave populations may not be severely affected by wildfire. Openings created by fire could conceivably result in temporary, less-competitively populated habitat for agave. Post-fire slope erosion may occur and could bury or scour hillsides and rocky places where Parry's agave occurs.

The CNM proposes a relatively cool burning prescription to be conducted during the cooler times of the year, with tightly controlled blacklines and constant fire crew supervision, as well as the presence of a Resource Advisor. The overall risk of agave mortality or damage greater than twenty percent is very unlikely in the proposed burn areas, and documented, true agave mortality is expected to be half that amount.

CUMULATIVE EFFECTS

Cumulative effects are those adverse effects of future non-Federal (State, local government, and private) actions that are reasonably certain to occur in the project area. Future Federal actions would be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed project. Effects of past Federal and private actions are considered in the Environmental Baseline. The land in the project area is managed by the National Park Service, a Federal agency. Three significant LLNB roosts are known on Federal lands administered by the U.S. Forest Service (Coronado National Forest) and private land. Activities on State and private lands may require permits or funding from Federal agencies. Many actions that could be reasonably expected to occur may adversely affect the lesser long-nosed bat and would be subject to section 7 consultations. Compliance with the Act for activities on non-Federal lands that may affect the lesser long-nosed bat, but are not addressed by section 7 consultation, could occur through section 10(a)(1)(B) of the Act.

CONCLUSION

After reviewing the current status of the LLNB, the environmental baseline for the action area, the effects of the proposed action, and cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the LLNB. Critical habitat has not been designated for the lesser long-nosed bat; thus, none will be affected. We present this conclusion for the following reasons:

1. The proposed project includes important and major features to minimize direct and indirect effects of the action on the LLNB, its foraging resources, and its habitat.
2. Large roosts are not known to occur in the CNM, and surveys have been carefully conducted and were monument-wide.
3. The project area in which burning will occur covers a very small, edge-of-species-range area compared to the total available lands and food resources in the full range of the LLNB.
4. The proposed action is expected to result in reduced risk of catastrophic-effect, stand-replacing fire that could result in erosion and loss of habitat for agave and forage resources for the LLNB.
5. The proposed action will occur prior to the seasonal arrival of LLNB.

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 without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such

conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Harass is defined in the same regulation by the Service 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 that include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take of a listed animal species that is incidental to, and not the purpose of, the carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, 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 CNM so that they become binding conditions of any grant or permit issued to any applicant, permittee, or contractor, as appropriate, in order for the exemption in section 7(o)(2) to apply. The CNM has a continuing duty to regulate the activity covered by this incidental take statement. If the CNM (1) fails to assume and implement the terms and conditions or (2) fails to require any applicant, permittee, or contractor 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 Coronado 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)].

AMOUNT OR EXTENT OF TAKE

The Service anticipates incidental take of LLNB in the form of harm through the burning of 2,856 acres of LLNB foraging habitat. Take will be considered exceeded under the following conditions:

1. The prescribed fire burns more than 2,856 acres, or
2. Agave mortality post-fire (one year) exceeds 20 percent.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If the incidental take anticipated in the preceding paragraphs is met, the CNM shall immediately notify the Service in writing. If, during the course of the action, the level of anticipated incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation. In the interim, the CNM must cease the activity resulting in the take if it is determined that the impact of additional taking will cause an irreversible and adverse impact on the species. The CNM 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. This biological opinion does not authorize any form of take not incidental to the CNM's proposed action as described herein.

EFFECT OF THE TAKE

In this biological opinion, the Service finds that this level of anticipated take is not likely to jeopardize the continued existence of the lesser long-nosed bat.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take authorized by this biological opinion:

1. The CNM shall use their designated burning areas and well-defined operational procedures to implement and reduce adverse effects to lesser long-nosed bat forage plants due to prescribed fire.
2. The CNM shall monitor incidental take resulting from the proposed action and annually report to the Service the findings of that monitoring.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the CNM must comply with the following terms and conditions in regards to the proposed action. These terms and conditions implement the reasonable and prudent measures described above. Terms and conditions are nondiscretionary.

1. The following terms and conditions implement reasonable and prudent measure number one:
 - a. No more than 20 percent of agaves that are burned during the proposed action will be killed by the fire.
 - b. A Resource Advisor(s) shall be on the fire during all fire activities. Resource Advisors shall be qualified biologists designated to coordinate lesser long-nosed bat concerns and serve as an advisor to the fire boss. They shall also serve as field contact representatives responsible for coordination with the Service. They shall monitor fire activities to ensure protective measures endorsed by the fire boss are implemented. Resource Advisors shall be on call 24 hours.
 - c. Should any lesser long-nosed bat roosts be located either in the primary burn area or in the MMAs before completion of all phases of the project, the CNM shall consider this new information, and in accordance with 50 CFR 402.16(b), the CNM shall discuss with the Service whether reinitiation of consultation is warranted.
2. The following term and condition implements reasonable and prudent measure number two:

- a. The CNM shall conduct monitoring of agave population density, survival, and flowering in accordance with a study design agreed upon by the CNM and the Service. The objective of the monitoring shall be to establish trends in bat forage resources.
- b. If the CNM detects any take of lesser long-nosed bat as a result of the proposed action, such take shall be documented. A brief report summarizing the results of such documentation, monitoring, acres burned, implementation and effectiveness of these terms and conditions, shall be submitted to the Service in a monitoring report no later than six months after completion of all phases of the project. The report shall also make recommendations, as needed, for modifying or refining these terms and conditions to enhance protection or reduce needless hardship on the CNM or its permittees/contractors.
- c. The CNM shall read pre- and post plots for the years 2001 to 2006 and annually report results to the Service. This may be included in the CNM's annual take report for (if any) LLNB.

DISPOSITION OF DEAD OR INJURED LISTED ANIMALS

Upon locating a dead or injured threatened or endangered animal, initial notification must be made to the Service's Division of Law Enforcement, Federal Building, Room 105, at 26 North McDonald, Mesa, Arizona (480/835-8289) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph, and any other pertinent information. Care must be taken in handling 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 animal species 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 prior to implementation of the action. Injured animals should be transported to a qualified veterinarian by a qualified biologist. Should any treated listed animal survive, the Service should be contacted regarding the final disposition of the animal.

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for the lesser long-nosed bat. In furtherance of the purposes of the Act, we recommend implementing the following actions:

1. The CNM should investigate the fire ecology of paniculate agaves in the Chiricahuas.
2. The CNM should continue with monument-wide LLNB surveys.

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

(Note: Any surveys for lesser long-nosed bats, or other bats, that involve capture or take require appropriate permits from the Service and Arizona Game and Fish Department).

CLOSING-REINITIATION

This concludes formal consultation on the CNM Little Picket and Madrone Prescribed Fire project. 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 maintained (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 adversely 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 a 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 this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation, if it is determined that the impact of such taking will cause an irreversible and adverse impact to the species. Any questions or comments should be directed to Thetis Gamberg (520) 670-4619 or Sherry Barrett (520) 670-4617. Thank you for your cooperation and assistance throughout this consultation process.

/s/ David L. Harlow

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
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Chief, Nongame Branch, Arizona Game and Fish Department, Phoenix, AZ

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CONCURRENCE

Mexican spotted owl (MSO)

CNM wildlife observation records from December 1973 to December 1994 reveal 21 recorded occurrences of either MSO visual sightings or vocalizations. These were located within the area now designated as the Shake Spring PAC (see BE, Figure 4). In 1994, formal MSO surveys were conducted in CNM and have been repeated annually. MSO presence has been continually documented in either one of two locations within CNM; those two areas are designated as separate PACs (Shake Spring and Echo). Nesting was not confirmed at that time, and remains undetected today. Nearby Forest Service lands (about 0.25 mile north and northeast of CNM) support two additional MSO PACs (Indian Spring and Wood Canyon).

Both Shake Spring and Echo PACs have been surveyed simultaneously to determine whether there are one or more birds. The 2000 survey located one MSO on February 13, by vocalization only, just across the road from the Natural Bridge trailhead. One MSO was heard again on July 10th and 11th, about 0.50 mile north of the campground. A roost site is suspected but not confirmed and nesting remains unconfirmed.

The Forest Service PACs (Wood Canyon and Indian Spring) do not abut the CNM at any point and are at least five miles away from the burn units. The CNM PACs (Shake Spring and Echo) are at least three miles from the nearest edges of the proposed burn units and separated from those burn units by large expanses of sparsely vegetated rocky exposures that do not contain roost-type features (ledges, grottos, etc.) and areas of manzanita where fire will not reach. The Little Picket burn will be conducted as an in-season (monsoon) burn, and the Madrone burn will occur in the fall to more fully reduce fuel litter buildup, ladder fuels, and brush encroachment.

Actions will be taken to minimize disturbances to MSO as follows:

1. The target burn areas and the MMAs exclude any area within a MSO PAC.
2. Resource Advisors with knowledge of MSO and the nearby PACs will be onsite at all times during any burning operations. They will participate in all decisions relating to any escaped fire situation and suppression actions.
3. MSO PACs and cores are established and 1995 MSO Recovery Plan (USFWS 1995) protocols followed, which include PAC monitoring for MSO presence and reproduction status.
4. Small-scale ignitions will be used and good mixing conditions plus favorable wind direction will improve smoke dispersion.
5. The Service will be immediately notified should an escaped fire situation develop.
6. Aerial support will be included in the available suppression options in the event of an escaped fire threatening a MSO PAC.
7. During fire suppression actions in the event of an escaped fire, one of the major objectives will be the protection of MSO PACs.
8. During aerial operations, the helicopter will refrain from flying over any identified PAC.

Based on the BE, site visits, prescribed fire burn plan, and telephone and electronic communications, the Service concurs that the Little Picket and Madrone Prescribed Fire Project, as described, may affect but is not likely to affect the MSO. Critical habitat for MSO does not exist within these burn units; therefore, none will be affected. This is based on the following:

1. MSO surveys have been completed for more than one year, monument-wide; MSO locations are well-documented and no MSO PAC or core areas will be treated. The Forest Service lands to the north and east support two MSO PACs within 10 miles of the project boundary.