

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

In Reply Refer To:
AESO/SE
02-21-04-F-0238

February 13, 2006

Memorandum

To: Superintendent, Saguaro National Park, Tucson, Arizona

From: Field Supervisor

Subject: Final Biological Opinion for Saguaro National Park Fire Management Plan

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated June 13, 2005, and received by us on June 15, 2005. At issue are impacts that may result from the proposed Saguaro National Park (SNP) Fire Management Plan (FMP) located in Pima County, Arizona. You determined that the proposed project is likely to adversely affect the endangered cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) (CFPO) and its proposed critical habitat (CH), the threatened lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*) (LLNB), and the threatened Mexican spotted owl (*Strix occidentalis lucida*) (MSO) and designated MSO CH.

In your biological assessment (BA), you requested our concurrence that the proposed action is not likely to adversely affect the endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*), the endangered jaguar (*Panthera onca*), the endangered Pima pineapple cactus (*Corypantha scheeri* var. *robustispina*) (PPC), and the endangered Southwestern willow flycatcher (*Empidonax trailli extimus*) (SWFL). Critical habitat has been designated for the SWFL; however, none occurs within SNP and none will be affected by this proposed project. You also noted there would be no effect to the Chiricahua leopard frog. We concur with your determinations for these species; our rationales are provided in Appendix A of this BO.

This final biological opinion (BO) is based on information provided in the June 2005 biological assessment, the 2004 Environmental Impact Statement (EIS), telephone conversations between staff, field investigations, and other sources of information. Literature cited in this BO is not a complete bibliography of all literature available on the species of concern, fire management and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at our Phoenix office.

CONSULTATION HISTORY

- April 1, 2004: Initial discussion on issues to be addressed in FMP.

- June 23, 2004: We provided a Pima County list of federally listed species.
- June, 2004: Discussion of listed species between staff.
- March 3, 2005: Draft BA status review.
- May 2, 2005: Confirmation of final Federal listed species list.
- May 16, 2005: FWS comments on Draft BA received by SNP.
- June 15, 2005: FWS received your final BA and request for consultation.
- October 18, 2005: Draft BO provided to SNP.
- January 23, 2006: SNP provided comments on draft BO.
- February 13, 2006: Final BO sent to SNP.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is use of wildland (within-prescription) and prescribed fires, suppression of wildland fires (out-of-prescription), and non-fire fuel treatments at SNP through 2010. The prescribed burning program operates at selected sites above 4,500 feet in elevation. The lower desert (about 4,500 feet and below) will be protected from fires. Non-fire fuel treatments for this FMP are defined as those operations using chain saws and hand tools for cutting and piling limbs, brush, and branches that would overhang handlines constructed in preparation for prescribed fire treatments. Non-fire fuel treatments are not anticipated to significantly add to the overall fuel loads and are not addressed further.

SNP is located in southcentral Arizona and contains 91,327 acres in two units that are separated by metropolitan Tucson. The Rincon Mountain District (RMD) is east and the Tucson Mountain District (TMD) is west of Tucson. Both units of the park are dominated by designated wilderness.

Park vegetation is identified in six vegetation types that were used to define two Fire Management Units (FMUs). FMU 2 is primarily Sonoran Desert scrub and desert grassland vegetation type; 10,000 acres of this vegetation occurs within the RMD and 24,000 acres occurs within the TMD. The remainder of the park is in FMU 1 (41,000 acres of primarily pine-oak, ponderosa pine, and mixed-conifer forest). A complete description of the vegetation types, and the fire weather and history that create the foundation for FMP strategies, are found in:

- EIS Section 1, Pages 3-5; Section II Pages 21-22; Section III Pages 56-59
- FMP Chapter III, Pages 19-41

For the purposes of this BO, the vegetation types at SNP provide an estimate of the habitat conditions and locations that may meet the habitat requirements of federally listed species. The EIS and FMP discussions describe the legal background for establishing the park and the wilderness within it, which largely frames the resource management concerns to be addressed by the FMP. The EIS and FMP also summarize land management decision documents, interagency agreements, and agency policies that set sideboards and guide the fire management program at the park. Finally, they review the environmental conditions that exist now, and describe how the current conditions relate to expectations of more historically typical fire regimes at SNP. Those discussions frame the general land-management considerations that must be addressed by FMP implementation, and illustrate the purpose and need for the FMP. A more detailed explanation of the background for the FMP is found in:

- EIS Section I, Pages 1-6 and Pages 9-13
- FMP Chapters 1 and 2, Pages 7-16

The FMP defines the program at SNP for the use of wildland and prescribed fires, suppression of wildland fires, non-fire fuels treatments, emergency rehabilitation and restoration, and adaptive management changes to make adjustments to the program as effects and results are documented through the life of the plan. It will guide park fire management actions from the date of consultation through March 2010 and may be extended if appropriate. The FMP will be supplemented with more detailed action plans (prescribed fire burn plans, fire prescriptions, etc.) as those documents are prepared at the project level. Staff from SNP and the FWS will review effects and results and determine if and when reinitiation of consultation is necessary.

Two FMP objectives particularly pertinent to management of listed species are to:

- ensure the perpetuation of native species and the suppression of non-native species through the preservation of ecological processes, and
- manage the natural resources based on data gathered through active research programs in the natural, cultural, and social sciences.

While implementing the FMP, several fire management strategies and tools will be employed, including wildland fire suppression, wildland fire use for resource benefits, prescribed fire, and non-fire fuels treatments. If necessary, following any of the fire strategies, emergency rehabilitation and restoration actions will be conducted, but they are not described in detail in the FMP due to the uncertainties of when and where those restoration actions may be required. Subsequent planning and NEPA compliance will be conducted to address those situations. A detailed explanation and definition of the activities that will implement the FMP are in:

- EIS Section I, Pages 1-6 and Pages 9-13

- FMP Chapters 4, 6, 10, 11 and 12 and Appendices 4, 5, 6, 7, 9, 10 and 12 (Appendix 12 – Monitoring Plan to be added before finalization of FMP)

Prescribed fire activities are discussed in greater detail in the EIS and FMP and are incorporated herein by reference. Refer to Figure 1 (Tables and Figures are at the end of this BO) for additional information on the proposed scheduling of prescribed fire activities.

Wildland fire use for resource benefit is the practice of managing a naturally-ignited wildland fire by allowing it to burn, as long as it burns within a pre-set prescription, while keeping it within a specific area called a “Maximum Manageable Area” (MMA). Through pre-planning, monitoring, and appropriate fire-management decisions and tools, some wildland fires can be managed to protect values at risk, as well as obtain resource benefits. Elements of successful implementation of wildland fire for resource benefit includes public information and education, coordination with other agencies, and fire behavior research and application. The Wildland Fire Implementation Plan (WFIP) (Appendix IV of the FMP) presents the decision process and criteria for determining if a wildland fire qualifies for management as a wildland fire for resource benefits. The WFIP is incorporated herein by reference.

Burn unit re-entries for conducting prescribed fire will occur at varying intervals during the life of the FMP (10 years). Fire effects are anticipated to continue to be lessened in all aspects on the landscape as time goes on and more re-entries are conducted. Some non-fire fuel treatments (limbing overhanging trees along firelines) will occur due to annual plant growth, but they are not anticipated to be significant.

Conservation Measures

Refer to Appendices B and C of this BO for a detailed explanation of conservation measures to be conducted for this FMP. An Annual Report will be generated as part of the FMP. The Report will clearly document changes to the habitat baseline for listed species through the life of the FMP (Appendix 1 of the BA). It may also contain information on the species themselves, if available (e.g., species surveys, incidental take, etc.). The primary purpose of the Report is to determine whether the changes in habitat conditions as a result of implementing the FMP are within the expected effects documented in this BO.

The Report will be prepared jointly by the SNP Fire Management and the Resource Management staff annually, beginning the winter of 2006-2007, for the life of the FMP (through 2010). The Report will be delivered to the FWS’ Tucson suboffice for staff review to determine if the FMP effects are within those anticipated in the BO and whether changes are needed.

STATUS OF THE SPECIES RANGEWIDE

Cactus ferruginous pygmy-owl

The Arizona population of the CFPO was listed as an endangered distinct population segment (DPS) on March 10, 1997 (U.S. Fish and Wildlife Service 1997) without critical habitat. On

November 27, 2002, the FWS proposed 488,862 ha (1,208,001 ac) of critical habitat in Pima and Pinal counties in Arizona (U.S. Fish and Wildlife Service 2002a). A draft recovery plan for the species was released in January 2003 (U.S. Fish and Wildlife Service 2003a).

The range of the Arizona DPS of the CFPO extends from the international border with Mexico north to central Arizona. The majority of Arizona CFPO detections in the last seven years have been from the northwestern Tucson area in Pima County. Other recent CFPO detections have been in southern Pinal County at Organ Pipe Cactus National Monument, Cabeza Prieta National Wildlife Refuge (NWR), and Buenos Aires NWR, Altar Valley, and on the Coronado National Forest (CNF). Survey results conducted from 1997 to the present indicate an increase in our knowledge of CFPO distribution resulting from increasing survey efforts over time, and recently, what also appears to be a declining trend in numbers of CFPOs in Arizona.

Over the past several decades, CFPOs have been primarily found in the Arizona Upland Subdivision of the Sonoran desert, particularly Sonoran desert scrub. This community in southern Arizona consists of saguaros and sometimes relatively large trees (paloverde, ironwood, mesquite, acacia), and a diversity of plant species and vegetation strata. Recently, CFPOs have also been found in semidesert and Sonoran savanna grasslands with xeroriparian washes (e.g., the Altar Valley). Xeroriparian habitats contain a rich diversity of plants (mesquite, ash, and hackberry) that support a wide array of prey species and provide cover. Semidesert grasslands consist of grasslands with dispersed mesquite trees, and very few, isolated saguaro cacti in some areas (U.S. Fish and Wildlife Service 2003b).

CFPO typically nest as yearlings and both sexes breed annually thereafter. Territories normally contain several potential nest-roost cavities from which females select a nest, so cavities per acre may be fundamental criterion for habitat selection. CFPOs in Arizona have been recorded using cavities in cottonwood, mesquite, and ash trees, and saguaro cacti for nest sites. Most nests in recent years have been found in saguaros.

CFPOs exhibit a high degree of site fidelity once territories (the area defended) and home ranges (the area used throughout the year) are established. The owls are considered non-migratory throughout their range. Winter owl location records are documented from throughout its range in southern Arizona. Because of strong site fidelity, these owls are more likely to be affected by projects within their home range. Behaviorally, the bird's option to seek alternative areas outside of the home range appears limited, particularly for males. A 113 ha (280 ac) home range is considered necessary for the owls to meet their life history requirements on an annual basis (U.S. Fish and Wildlife Service 2003a).

Little is documented about the rate or causes of mortality in pygmy-owls; however, they are susceptible to predation from a wide variety of vertebrate species. Documented and suspected predators include great-horned owls, Harris' hawks, Cooper's hawks, screech-owls, and domestic and feral cats. CFPOs may be particularly vulnerable to predation and other threats during and shortly after fledging. Cover near nest sites may be important for young to fledge successfully (U.S. Fish and Wildlife Service 2003a).

A 50 percent fledgling mortality was estimated in 1999-2001, and no more than 12 owls were known to have successfully dispersed from natal areas in any one year. As with other southwestern species, drought has severe impacts to CFPO productivity. In comparison with 2001, when 17 nests were confirmed, only three nests were observed in 2002 (an 82 percent decline in nesting). From these three nests, nine young were produced, all of which died prior to or during dispersal (U.S. Fish and Wildlife Service 2003b).

One of the important factors in the decline of the CFPO is the loss and fragmentation of habitat. Historical and recent information suggests that indirect correlations exist between the decline in abundance of CFPOs and urban and agricultural expansion, such as that occurring in many portions of southern Arizona. It has been suggested that the destruction of riparian woodlands played a significant role in the decline of CFPOs in Arizona. It is estimated that between 85 and 90 percent of riparian woodlands in the southwestern United States have been lost or modified from a variety of land-use practices. Historically, and in recent decades, the loss of these habitats has impacted the CFPO. Today, loss and fragmentation of upland and xeroriparian Sonoran desert scrub and semi-desert grassland vegetation from large scale residential and commercial developments continue to threaten the CFPO (U.S. Fish and Wildlife Service 2003b). Other known threats and potential threats include direct and indirect human-caused mortalities (e.g. collisions with cars, glass windows, fences and power lines; predation by domestic cats, etc.), fires, disease, and genetic stochasticity (U.S. Fish and Wildlife Service 2003b).

Information about the status of the CFPO in Mexico suggests the potential for their movement across the international border, and that there are fewer owls on the U.S. side of the border. Maintaining connectivity between populations in the U.S. and Mexico will be critical in recovery of the CFPO (U.S. Fish and Wildlife Service 2003b). Additional information about the species' ecology, status, threats, and other information can be found in the draft recovery plan (U.S. Fish and Wildlife Service 2003a).

Lesser long-nosed bat

The LLNB is listed as endangered (U.S. Fish and Wildlife Service 1988) without critical habitat. A recovery plan was completed in 1995 (U.S. Fish and Wildlife Service 1995b). A status review of the species is ongoing (2005). The LLNB is a nectar-, pollen-, and fruit-eating bat which migrates seasonally from Mexico to southern Arizona and southwestern New Mexico. The species begins arriving in the U.S. in April and most leave again in mid-September to late October (Cockrum and Petryszyn 1991; Sidner 1991; Hoyt *et al.* 1994). Caves and mines are used as day roosts, and the LLNB is known to fly long distances from roosts to forage (Dalton *et al.* 1994; U.S. Fish and Wildlife Service 1995b). Suitable day roosts and associated concentrations of food plants are crucial for LLNB population maintenance (U.S. Fish and Wildlife Service 1995b).

The LLNB is found in Sonoran Desert vegetation and montane woodlands. They forage in areas containing paniculate agave and columnar cacti, consuming nectar, pollen, and fruit (Hinman and Snow 2003). Agaves used as food sources include Palmer's agave (*Agave palmeri*), Parry's agave (*A. parryi*), desert agave (*A. deserti*), and amole (*A. schotti*). The importance of desert and

Parry's agaves is unknown, and amole is considered to be an incidental food source. The important cacti food sources include saguaro (*Carnegiea giganteus*) and organ pipe cactus (*Stenocereus thurberi*).

During the early part of their stay in the U.S. each year, pregnant female bats congregate at traditional roost sites, give birth, and raise their young. These roosts are located at lower elevations (below about 1,068 meters or 3,500 feet) within the range of columnar cacti in south-central and southwestern Arizona. Young (litter size one) are born during May, and can fly by the end of June. Males, and perhaps non-reproductive females, may be found at this time in roosts in the eastern part of Arizona. By late July, many females and young have dispersed from the maternity colonies and some have moved to higher elevations (up to about 1,678 meters or 5,500 feet) where they are found feeding on agave flowers (Hinman 2003). The LLNB does not hibernate and cannot withstand prolonged exposure to cold.

In Arizona, LLNB roosts have been found from the Picacho Mountains, southwest to the Agua Dulce Mountains, southeast to the Chiricahua and Peloncillo mountains, and south to the international boundary. Individuals have also been observed in the Pinaleno Mountains, and as far north as Phoenix and Glendale. This bat is also known from far southwestern New Mexico, specifically in the Animas and Peloncillo mountains. LLNB roosts have been documented on the Coronado National Forest (CNF) and at SNP, and individual bats have been documented feeding at night from hummingbird feeders in various parts of Tucson.

There has been a significant degree of debate and controversy among scientists regarding the actual population size and trends for this species. There is considerable evidence for the interdependence of this species and certain agaves and cacti. Excess harvest of agaves in Mexico, collection of cacti in the U.S., and the conversion of habitat for agricultural uses, livestock grazing, wood cutting, and other development, may contribute to the decline of long-nosed bat populations (U.S. Fish and Wildlife Service 1988). Furthermore, the species appears to be sensitive to human disturbance at roost sites, expending energy to flee sites if disturbed.

Arizona and New Mexico lie at the extreme northern edge of the LLNB's range. Fleming (1995) indicated that there were 16 known large roost sites in the U.S., with 1992 and 1993 surveys documenting an estimated 200,000 bats in these sites. Twelve major maternity roost sites are known from Arizona and Mexico. According to the same surveys (Fleming 1995), the maternity roosts are occupied by over 150,000 LLNBs (U.S. Fish and Wildlife Service 1995b). We are conducting a status review of the LLNB to better define its status and threats to the species. Additional information about the species' ecology, threats, and recovery strategies can be found in the LLNB recovery plan (U.S. Fish and Wildlife Service 1995b).

Mexican spotted owl

The MSO is one of three spotted owl subspecies and is listed as threatened with critical habitat. A recovery plan was completed in 1995 (U.S. Fish and Wildlife Service 1995a); a revision of that plan is in preparation. MSOs are disjunctly distributed from southern Mexico, northward into southern Utah and central Colorado (U.S. Fish and Wildlife Service 1995a). They occupy a variety of habitat types ranging from dense mixed conifer forests to steep-walled, rocky canyons.

Forest habitats occupied by MSOs generally contain mature and old-growth uneven-aged stands that are vertically complex with dense canopies. Little published data exists concerning foraging habitat for MSOs; however, it appears that foraging habitats generally have big logs, dense canopies, and large, densely distributed trees and snags (U.S. Fish and Wildlife Service 1995a). In southern Arizona, they typically occur in mixed-conifer, Madrean pine-oak, and Arizona cypress forests, encinal oak woodlands, and riparian forests. Nest sites are generally located in closed-canopy forests or steep-walled canyons. They form monogamous pairs, and if they attempt nesting (which does not always occur in consecutive years), they generally lay their eggs in late March or early April. The female incubates the eggs while the male forages for food and feeds the female. After the eggs hatch, the male feeds both the female and the young until the young leave the nest. Fledging of young occurs in late summer (July-August); refer to the 1995 MSO Recovery Plan for details of MSO natural history.

The owl's distribution is naturally discontinuous. The present range of the owl is believed to approximate the historical range, except that the owl is no longer found in lower-elevation riparian areas (U.S. Fish and Wildlife Service 1995a).

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

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

Threats to the MSO and to its critical habitat are known and vary by RU. Threats in the Basin and Range-West RU (which includes SNP) are stand-replacing wildfire, recreational activities (especially on public lands in proximity to large urban areas), and livestock grazing and its associated activities. All five RUs in Arizona and New Mexico list catastrophic, stand-replacing wildfire as the primary threat to the species. A review of wildfires affecting the MSO on National Forest lands was completed by us in 2003. The review noted that the Basin and Range-West RU had experienced multiple, high to moderate intensity, stand-replacing fires in recent

years and the frequency of these fires may be increasing due to prolonged drought. We strongly believe catastrophic wildfire is an imminent threat to the MSO and its critical habitat.

Since the owl was listed, we have completed or have in draft form a total of 164 formal consultations for the MSO. These formal consultations have identified incidences of anticipated incidental take of MSO in 360 PACs. The form of this incidental take is almost entirely harm or harassment. These consultations have primarily dealt with actions proposed by the Forest Service, Region 3. In addition, we have reviewed the impacts of actions proposed by the Bureau of Indian Affairs, Department of Defense (including Air Force, Army, and Navy), Department of Energy, National Park Service, and Federal Highway Administration. These proposals have included timber sales, road construction, fire/ecosystem management projects (including prescribed natural and management ignited fires), livestock grazing, recreation activities, utility corridors, military and sightseeing overflights, and other activities. Only two of these projects (release of site-specific owl location information and existing forest plans) have resulted in biological opinions that the proposed action would likely jeopardize the continued existence of the MSO.

ENVIRONMENTAL BASELINE IN THE ACTION AREA

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 action which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

We define the action area to be all lands within SNP and a 0.25 mile buffer surrounding the park boundaries to account for noise effects.

A. STATUS OF THE SPECIES WITHIN THE ACTION AREA

CFPO

Both Districts of SNP contain potential CFPO habitat, including virtually all of the TMD and about 40,000 acres of the RMD below 4,000 feet in elevation. Proposed CFPO critical habitat (about 24,700 acres) is present only on the TMD (see Federal Register 67: 71032-71064) (M.Weesner, pers. comm. 2005).

From 1994 to the present, SNP staff, AGFD biologists, private contractors, and volunteers have surveyed for CFPOs within and nearby SNP. These surveys (about 300 surveys in each district) have been about equally divided between inventory efforts and project clearance surveys. All of these surveys followed protocols specified by AGFD and FWS at the time they were conducted. These surveys have resulted in a single CFPO detection occurring within SNP, on October 12, 1995, in the RMD. Subsequent surveys have not detected any CFPOs. Unconfirmed records

from the past twenty years suggest CFPOs may have once inhabited both districts of SNP (SNP files).

LLNB

At SNP, LLNB bat surveys confirmed a small colony (less than five bats since 1991, when the roost was discovered) of LLNBs in the RMD (Sidner 1991, Sidner and Davis 1994). In June 2005, exit counts revealed presence of less than 10 LLNB at the Box Canyon Crevice roost (N. Kline, NPS, pers. comm.). We believe these bats are foraging in the dense saguaro stands of the RMD early in the summer, and perhaps using agave flowers (*Agave palmeri*) found at higher elevations in this district (3,000 - 7,000 feet) (Bowers and McLaughlin 1987) later in the year.

MSO

MSO surveys in SNP since 1992 have documented five resident pairs. MSO appear to have consistently occupied the same areas, though sometimes only one bird is present (Table STOC-1). Table STOC-1 illustrates that MSO surveys were not conducted every year. Considering each cell of the Table as representing an “opportunity” to detect MSO presence, there are 65 opportunities represented. In 30 of those opportunities (46 percent), MSO surveys were not conducted. In the 35 (54 percent) situations where the site was surveyed, owls were not detected three times (five percent of the opportunities). Also, in the 35 visits that did occur, owl fledging was documented 10 times (15 percent of the opportunities). Reproductive chronology varies across the subspecies’ range, and in the Rincon Mountains, young owls leave their nests from mid-June to July, though they are not truly volant (able to fly) until later in July or August. Young-of-the-year owls leave their home ranges in September or early October (Willey 1997, Knipps 1999).

Annual reproductive success of MSO in the Rincon Mountains from 1996-1999 (per the chart) was about 0.7 young per pair, which is high compared to other MSO populations in those years. The high reproductive success in 1999 (six young fledged out of four nests) is likely correlated with the high rainfall and an apparent abundance of prey species that year. In 2002 and 2003, only one fledgling was produced by the four owl pairs on Mica Mountain. Poor reproductive success during those years was likely due to a prolonged and severe drought.

Prey species for MSOs vary across the subspecies’ range, but small- to medium-sized rodents (woodrats, peromyscid mice and microtine voles) generally account for the bulk of the species’ diet (U.S. Fish and Wildlife Service 1995a, b). Analysis of MSO pellets collected in the Rincon Mountains corroborated these findings. Rincon Mountain owls feed on small to medium mammals (from shrews and bats to squirrels and rabbits, but mainly deermice and woodrats), passerine birds, amphibians, and invertebrates (DeRosier 2002).

B. FACTORS AFFECTING SPECIES’ ENVIRONMENT WITHIN THE ACTION AREA

CFPO

Since about 1992, some small, human-caused (arson) fires have occurred in the western unit of SNP; they have been generally less than 10 acres and rapidly extinguished. During the past 13 years, fire suppression effects in this CFPO potential habitat have been insignificant. Trails for recreational users are marked and monitored and SNP strongly protects the non-fire-adapted portions of the park that support saguaro and xeric riparian vegetation.

LLNB

While a very small colony (less than five bats) exists in SNP, the topography and geology of the action area do not support caves, mines, shafts, audits, or large overhangs that support large numbers of LLNBs. Manning Camp, located in the RMD, is a set of buildings that are sealed against mice and bats and usually occupied at various times of the year by fire crews and other personnel, and is visited by hikers.

The upper elevations of the RMD are within the Saguaro National Park Wilderness boundary. These lands are protected from improper livestock grazing, roads, mineral and water extractions, water diversions, off-highway vehicle uses, and energy exploration operations. Recreational use is light (hiking, birdwatching, photography, hunting, etc.).

MSO

MSO (five resident pairs) occur in the upper elevations of the action area. Their PACs and nest core areas lie within the Saguaro National Park Wilderness boundary. As with the case of the LLNB above, these lands are protected and recreation use in them is light.

MSO CRITICAL HABITAT

The RMD lies within the boundaries of MSO CH BR-W-11 (along with portions of the Coronado National Forest). The total acreage of designated MSO CH in this RU is 233,228 acres, of which about 41,000 acres is managed by SNP. This acreage is limited to areas that meet the definition of primary constituent elements (see below) and is a subset of the 233,228 acres.

The primary constituent elements for MSO CH are:

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

- High volumes of large diameter (12 inches dbh or greater) fallen trees and other woody debris;
- Wide range of tree and plant species, including hardwoods; and
- Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.

The general vegetation types in SNP that best approximate this description of primary constituent elements are the mixed-conifer, ponderosa pine, pine-oak forest, and pine-oak woodland types; particularly the riparian woodland and forest, which occur as lesser acreage inclusions within the general vegetation types. These general vegetation types are an initial estimation of the distribution of primary constituent elements in this MSO CH Unit.

EFFECTS OF THE ACTION

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

CFPO

The FMP notes that prescribed fire or wildland fire use for resource benefit will not be conducted in the low desert lands (about 4,000 feet in elevation or below) of the park. Fires will be suppressed in these lands. The exception to this could be that rare situation when fire staff and equipment are not available to take suppression action, or when the fire conditions are so extreme that firefighter safety is a concern. The expectation is that SNP fire staff will take immediate fire suppression actions on any fire occurring in FMU 2, and by implication, any potential CFPO habitat in the park. Mechanical treatment of fuels (grass-mowing or hand-grubbing shrubs) in potential CFPO habitat will occur, but this will be strictly confined to areas near structures and human-use areas (picnic areas, trailheads, parking lots).

Human, hand tool, and on-road vehicle noises are likely to occur because any fire in FMU 2 will be suppressed. The full extent of suppression actions are estimated at this time; further details and analysis should be available at the time of the first Annual Report (see examples in Appendix 1). For analysis purposes of this BO, we assume the following:

- CFPO presence surveys can begin as early as January first, annually. Knowledge of CFPO site fidelity will allow us to assume a CFPO detected in SNP in January would likely still occur in June through September (monsoon/lightning season). There is limited opportunity to advise firefighters to avoid areas occupied by CFPOs at the time of fire suppression actions, but such advice will be given as best as can be determined from

previous knowledge of CFPO presence and potential habitat. Any CFPOs occupying unsurveyed habitat would also be at risk from suppression activities (most likely noise and water application to vegetation).

- There is the small potential for direct mortality of CFPOs during suppression of a wildland fire. It is remotely possible that an undetected, nesting CFPO with young could be injured or killed due to suppression actions (direct water treatment that accidentally harms or harasses a CFPO, eggs, or young, or its nest tree or saguaro). We believe this to be a highly unlikely occurrence because the desert does not carry fire in a manner that would make this tactic desirable or necessary. The small potential for direct mortality is diminished even more by the fact that one CFPO detection has been made in SNP since annual surveys were begun in 1994, it was not a nesting bird, and subsequent years of surveys have not detected a nest or another CFPO in SNP.
- During suppression actions taken to fight wildfire in potential CFPO habitat, the likelihood of:
 - using slurry tankers is low,
 - tree-cutting is low,
 - helicopters water drops is low,
 - construction of scratch lines is low to moderate,
 - water application from engines using existing roads is high
 - water application from engines traveling off-roads is low.

CFPO Proposed Critical habitat

We note that the FMP activities of prescribed fire and wildland fire used for resource benefit will not be allowed to occur in the low desert areas that support proposed CFPO CH; limited fire suppression activities are most likely to occur in this habitat. We note that the likelihood of off-road vehicle travel is low, use of dozers or scratch lines is low, and water use from engines (on-road) is high. We believe that suppression effects in proposed CFPO CH will be insignificant and discountable.

LLNB

LLNB surveys are conducted in the action area every few years, and while LLNB habitat is greatly lacking in SNP, a handful (less than five) of LLNBs have been documented in a rock crevice located in rocky, sparsely-vegetated portion of the park. FMP activities (fire suppression, prescribed fire, or wildland fire use for resources benefits) are not expected to directly affect LLNBs at this site because of its location in a rocky, sparsely vegetated area that is very unlikely to carry fire (prescribed or resource use) or require fire suppression actions (water treatments, handlines).

LLNB likely forage throughout SNP, and are expected to do so at the lower elevations where the saguaros and the vast majority of the park's agaves occur. LLNB food sources (saguaros and agaves) are located in areas that are not to be burned. Wildfires occurring here will be immediately suppressed, per the FMP. Suppression activities will consist of creation of handlines as needed (using established trails and roads) and water treatments (water being sprayed from fire engines that will remain on-road). There is no anticipated off-road travel. This will protect the primary and vast majority of LLNB food sources in the action area.

Some FMP activities (prescribed fire, wildland fire use for resource benefits) will occur in the higher elevations of the park (areas above 4,500 feet in elevation), and may cause mortality to some of the lesser numbers of agaves that occur at these elevations. This also depends on agave distribution, numbers, age classes, cluster-type, and the fuel load surrounding agaves in the area of the fire. Agave mortality could occur if agaves are: 1) small in size; 2) growing in clusters with mesquite, acacia, and dead, dried agaves; or 3) growing in areas of high, fine, fire-promoting fuels. We anticipate that the reduction or loss of these numbers of agaves will be small and insignificant to any LLNB in the park, because of the much smaller overall numbers and distribution of agaves at the higher elevations and the protections afforded the greater resources in the lower elevations.

MSO

Prescribed fire use planned to occur in areas of MSO habitat is intended to result in a strongly reduced risk of catastrophic, stand-replacing wildfires in this particular habitat. Catastrophic wildfires result in large-scale, long-term losses of large-diameter trees, snags, and vegetation; MSO prey species and their supporting habitats; and larger acres of vegetation burned at greater intensities and severities than is typical for this particular MSO habitat in historical times (as known from tree-ring data studies).

To prevent such unnatural wildfires, FMP prescriptions are designed to reduce ladder fuels (shrub and understory layers) and reduce smaller diameter (one and 10-hour) ground fuels. Reducing the likelihood of catastrophic fire has strong, short- and long-term benefits for MSO, and its habitat. There will be short-term adverse effects to MSO, its habitat, and MSO prey species and habitat, during and immediately following FMP activities. These are expected to be localized reductions in numbers and distribution of MSO prey species, one growing season post-burn, after which the numbers and levels are anticipated to return to those before the fires.

Prescribed fire and wildland fire use for resource benefits will initially reduce some of the habitat components which characterize MSO habitat. The 1995 MSO Recovery Plan describes MSO nesting habitat in forested areas as old-growth stands with complex structure; uneven-aged, multistoried, and supporting high overstory canopy closure. We believe that information used for the 1995 MSO Recovery Plan came from northern, more heavily forested areas in the range of the species. MSO in the Basin and Range-West RU are documented as using a wider variety of landscapes and forested cover types that can include narrow rocky canyons with oak and pine-oak stringers. Sometimes the

overstory canopy is thin or covers small areas in drainages and canyons; still, we believe careful use of prescribed fire and wildland fire for resource benefit will result in a higher-quality landscape and prey base for MSO use. Prescribed fire and wildland fire for resource benefits as applied in the FMP will reduce some understory canopy layering, create occasional, small (less than three acres) gaps in the forest overstory canopy (where fire flares up in a patch of doghair thickets, for example), and reduce the amount of small diameter (one and 10-hour fuels) dead and down woody debris on the forest floor.

SNP proposes to manage fire in MSO habitat so that it results in a varying mosaic pattern of burned and unburned areas on a landscape level. In very few and small-sized sites, we anticipate managed fire intensity can be hot enough to kill smaller patches or closely-grouped sets of trees that contribute to the overstory canopy; but mortality of understory trees, shrubs, bushes, and smaller-sized dead and down debris will be the targeted results.

Coarse woody debris provided through time:

- As a result of tree and branch mortality from fire, there often is a “pulse” of coarse woody debris on the ground. This pulse of coarse woody debris occurs from as short a time as a month, to as long a time as twenty years after the fire, depending on the biomass killed and subsequent environmental conditions. This coarse woody debris provides essential habitat conditions for many small mammals and increases abundance, availability and distribution of MSO prey species (rodents, voles, woodrats, etc.).
- Coarse woody debris also contributes to increased chances for hotter, future ground fires due to the increased amount of dry fuels on the ground, increasing the potential for more severe fire effects and a lessened ability to control subsequent fires. This can result in reduction of MSO prey species and their habitat as forbs and grasses may take one growing season post-fire to return to pre-fire conditions.

Patches of dead overstory trees:

- In those situations where the fire intensity is great enough to kill patches of overstory trees, this will open the canopy and alter or remove some small patches of MSO habitat components. The size of these patches will vary, but are likely to remain small due to the existing forested conditions.
- These patches create openings in the overstory canopy that can result in increased summer temperatures in and immediately around the opening. This could possibly induce MSOs to move to cooler areas.
- Openings in the overstory canopy can promote increased sun-tolerant forbs and shrubs; thus contributing to localized increases in MSO prey species numbers and availability.

Mortality of understory trees:

- Understory tree mortality will reduce ladder fuels which contribute to higher-severity wildland fires and lessened management ability to control those fires.
- Opening the understory will create foraging opportunities for MSO where they may not have existed previously. Very dense understory growth can deter or prevent MSO from accessing some prey species; a more opened understory can facilitate foraging activities.
- Mortality of understory trees can also contribute to an even-aged forest structure.

Smoke management:

- Smoke (especially longtime, lingering, heavy smoke) can adversely affect MSOs. Physical discomfort to MSO can occur from extended exposure to heavy smoke, localized decreases in available oxygen, increased carbon dioxide and other gases, irritants carried in smoke, increases in ambient temperatures, and other, unknown or undocumented effects. Physical discomfort can result in adult MSOs leaving an area, nest, roost, or foraging site during a fire event.
- Exceptions to adult MSO moving from an uncomfortable site could be adult breeding MSO with eggs or young. These owls would have an increased risk of experiencing adverse effects from smoke.
- Smoke effects are anticipated to be reduced, offset, or eliminated by adherence to the FMP's conservation measures and the Arizona Department of Environmental Quality (ADEQ) smoke-management guidelines, as included as part of the FMP and the proposed action.

Precise acreages (as approximated by a burn unit) which would be burned per year cannot be stated definitively because of the nature of prescribed fire operations. Specific weather conditions must be met and fuel conditions must be within a specific range of values as well. The fuel accumulations will depend upon how recently a fire has moved through the area and what fire behavior (fuels consumption) occurred. The ongoing possibility of wildland fire becomes an overlaying influence in the planning for prescribed burning; thus, if an area has recently burned, that area would be less likely to be treated with a prescribed burn.

The total acreage overlay between the six defined prescribed burn units and four MSO PACs is 2,010 acres (Tables STOC-8, STOC-9, STOC-10, and STOC-11). The core area acreage overlap is 313 acres among the four PACs. The fifth MSO PAC, Rincon Peak, is not to be affected by proposed prescribed fire.

Prescribed fire use, per the FMP, is not likely to cause the death or injury of non-nesting MSOs because the fire severity will be low (flames lengths will be low, heat level will be low, time on the ground will be short, etc.) and MSOs have the ability and willingness to abandon an area if the fire conditions become too extreme for them. However; nesting adults may not abandon the area, and the eggs or young would be unable to leave the nest site to avoid uncomfortable smoke or heat. In this case, prescribed fire occurring during the MSO breeding season could kill or

injure MSO (adult, eggs, or young). Because fire effects will likely occur during MSO breeding season (March 1 to August 31, annually), and MSO young are nestlings, branchlings, or fledglings from June to the end of August, we believe there will be adverse effects to MSO from prescribed fire.

Short-term reduction in MSO prey species populations will occur in burned areas for the first growing season (post-burn). Regrowth of grasses and forbs following the fire is expected to allow small mammals populations to return to pre-burn numbers within one year. Overstory tree canopy closure in MSO habitat is expected to remain unchanged after prescribed fire treatments, but understory canopy layering may be modified or reduced.

Willey (1998a) showed that, for the most part, owls exhibited normal roost behavior during prescribed fire operations in 1996, as qualitatively judged by the field researchers. One female MSO did change her diurnal roost site for the duration of the fire activity, but returned to her habitual roost after the burn ended. Nocturnal movements of a male MSO during a 1996 burn did not differ from pre-burn movements (F. LaSorte, spotted owl biologist, pers. comm.), nor did the behavior/activity of the two MSO pairs change during the initial Chimenea Burn (1998a). Anecdotal support for prescribed fire could be interpreted from the fact that all of these birds stayed in the PACs in subsequent years and successfully fledged young at least once in the next three years. The Italian Springs pair fledged young each of the following three years.

Since the Willey study, two additional prescribed fires have occurred in MSO PAC habitat in SNP (Tables STOC-3 through STOC-7); MSO continued to occupy the PACs (Table STOC-1). Indications are that past prescribed fires conducted in the Rincon Mountains have not caused the MSOs to permanently alter habitat use patterns; however, all those fires followed Conservation Measures which called for the fires to occur outside of owl 100-acre core areas (nesting habitat) and after owl surveys had determined owls were not nesting (MSO reproductive status surveys). Prescribed fire use implemented by the FMP will not necessarily follow immediately after MSO surveys are conducted, and prescribed fire, under the proper prescription, may include some burning at low levels through MSO 100-acre core areas, although not necessarily at known nest trees or sites. This will likely result in adverse effects to MSO (noise, smoke, heat, localized loss of prey species and habitat supporting prey species).

In summary, past fire activity and the habitat effects of prescribed fire use and naturally-ignited wildfires in SNP appear to have been tolerated well by the MSO living in the park (Willey 1998a). Areas previously treated by prescribed fire are more resistant to high-intensity wildfire as demonstrated by the fire behavior of Helens 2 wildfire; that wildfire burned through an area that had been treated with prescribed fire. The Helens 2 wildfire was primarily a ground-based, non-canopy-opening fire that did not result in catastrophic, stand-altering effects to the forest.

Wildland Fire Suppression

Fire suppression will be conducted when a wildland fire is not meeting resource management objectives. At SNP, MSO habitat lies entirely in the designated wilderness, which emphasizes a need for minimal-impact fire suppression methods; thus, bulldozers are unlikely to be used. Typical fire-suppression activities in MSO habitat will involve hand crews cutting fireline around the fire perimeter to remove fuel; water and retardant drops from aircraft; thinning operations; “burn out” situations (backfiring to remove fuels); and “cold trailing” areas of low

fuel loads, where crews physically feel the ground and put out any perceived “hot spots.” Internal fire perimeter mop-up involves putting out any hot spots within the fire’s perimeter, but this method has limited usefulness because ground disturbance of mop-up usually causes additional natural resource damage and is not usually needed when containment is declared.

Overstory canopy closure in MSO habitat after suppression actions could vary from non-existent to fully intact, depending on the suppression actions taken to remove fuels or build line around a fire; but, typical SNP fire suppression activities do not involve bulldozing wide lines that open up canopy and remove large trees. Tree canopy is at reduced and thinned densities at the few structures in the park that would be at risk (Manning Camp). Higher-elevation trails are typically used as holding lines and fireline tie-ins.

Burnout operations can reduce (or, in smaller patches, eliminate) tree canopy and complexity, depending on what actions are needed to suppress wildfire. It is possible that burnout operations (even if not ignited in a nest tree site), could burn through a MSO nest site, and because of the increased amount and structure of ladder fuels and density of fuels in a nest site, burn hot enough to injure or kill an adult, breeding MSO with eggs or young, especially if this occurred early in the MSO breeding season.

Water and retardant drops from aircraft hit trees and the ground with great force. It is unlikely, but conceivable, that such an impact might injure or kill adult MSO, eggs, or young if this occurs directly on top of them and is not deflected well enough by the tree(s), branches, or topography above the nest/roost site. This is especially likely for eggs if the nest tree/snag is destroyed during a water or retardant drop or for fledglings/juveniles that have not yet developed flight skills. A startle response may increase an owl’s predation risk as well.

Indirect effects to MSO could occur through noise (people, handtools, chainsaws, aircraft), smoke, and heat. Fire suppression decisions to first protect human life and safety, then the protection priority of structures and properties, can alter the direction or intensity of a wildfire in specific areas. Decisions to suppress a wildfire on one front (to protect people, property, or other high value resources) may result in wildfire burning into MSO habitat.

In the case of wildland fires which do not meet criteria for “wildland fire use for resource benefits” and would be treated as a “suppression wildfire”, the effects are especially difficult to assess because of the many and great uncertainties related to management of such fires. The timing, location and extent, severity, etc. cannot be accurately predicted, but we refer to Tables STOC-3 through STOC-7, and the associated Figures STOC-1, and STOC-3 through STOC-7, to provide a basis for estimating suppression effects. Recent fire suppression and rehabilitation activities following the Helens 2 wildfire in SNP provides useful comparisons.

Wildland Fire Use for Resource Benefits

The following discussions of wildland fire use for resource benefits effects to MSO are complicated because:

- We are attempting to estimate the future effects of wildland fires, knowing there is inherent uncertainty of fire occurrence from year-to-year.
- The inherent uncertainty of fire behavior creates a possibility that a fire initially managed as a “wildland fire” may be converted to a “suppression fire” if conditions change.

Because of concerns about data quality and the effect of accumulated fire fuels, only those wildland fires documented after 1972 were used to estimate future wildland fire effects to MSO PACs. In the 32-year period from 1972 to 2004, wildland fire occurred on 3,771 acres of the SNP MSO PACs (overlapping of fires explains the acreage exceeding the total PAC acreage). The 3,771 acres burned in 17 fire events over the 32-year period. All but 52 acres of these fires occurred in the MSO PAC complex of Italian Springs/Helens Dome/Reef Rock/Spud Rock. Based on these data and the FMP, for the purposes of a coarse estimate of fire effects, we start with the following:

- We assume an average of 10 wildland fires per year will occur in the RMD of the park.
- We estimate there is a 75 percent likelihood that a wildland fire will meet the Wildland Fire Implementation Plan, Appendix V of the FMP) (WFIP) criteria and become managed as a wildland fire for resource benefit (an average of three wildland fires per year will be suppressed and seven will be managed as wildland fire for resource benefit).
- We estimate that the likelihood of wildland fire will affect MSO PAC acres (five fires per year) is about 50 percent.
- We believe that the average acres affected by wildland fires would be about 500 acres, in one or more MSO PACs, per year. This is about 16 percent of the total available MSO PAC acreage in the RMD.

We note these are crude estimates and expect to see far greater refinement in documentation of wildland fire occurrences and FMP actions and results in the annual report.

Using SNP fire history data, we estimate that wildland fire has the potential to affect, to some degree, all vegetation that could be considered MSO habitat in SNP (approximately 41,000 acres) during the next 10 years. Of those acres, 3,076 acres occur within designated MSO PACs. We believe the severity of possible effects from wildland fire use for resource benefits to MSO and its habitat will be reduced and moderated by the conservative application of the decision factors (Appendix IV of the FMP) in the WFIP.

Because fire burns for varying amounts of time and at different times of the year, effects of wildland fire use for resource benefits will vary. Depending on fuel moisture conditions, fuel loading, slope, aspect, relative humidity, and a variety of other factors, we believe the landscape will show a scattered mosaic ground pattern ranging from larger areas showing low intensity, low severity fire effects, through progressively smaller areas of increased effects or moderate fire, to very small areas of greater and total consumption of ground fuels and tree scorch marks.

We believe the overstory canopy closure will remain intact and the understory layering will be reduced or eliminated as understory vegetation is consumed or modified.

We anticipate that effects of wildland fire will be similar to those discussed for prescribed fire use. In summary, wildland fire use for resource benefits may have adverse, but short-term, effects to MSO and its habitat. Potential for adverse effects to nesting adult MSO, eggs, and/or young does exist. Noise, heat, smoke, and localized reduction in prey species distribution and availability (until after one growing season post-fire) are adverse effects to MSO, even at reduced levels of carefully applied wildland fire use. Overstory canopy closure in MSO habitat is anticipated to remain primarily intact, with some scattered, small-sized (less than three acres) gaps in the canopy immediately after burning.

MSO CH

Designated MSO CH exists within the action area, and some acres (except the riparian) will experience varying amounts, degrees, and types of actions in the implementation of this FMP. Fire-suppression actions can include construction of handlines, water and retardant drops, and burnout operations. Wildland fire used for resource benefits may also allow patches or thickets of dry ladder and ground fuels to burn hotter, and may result in small (less than three acres) openings in the overstory canopy. Constituent elements of MSO CH are not anticipated to be significantly reduced or eliminated by implementation of the FMP. Any minor loss in canopy is expected to recover quickly (within one growing season) as the overstory continues to grow and expand. Recruitment for snags and large, dead and down logs will continue and these large components are expected to remain on the landscape. Few large (greater than 12 inches dbh) trees are anticipated to be lost because of the careful application of prescribed fire prior to use of wildland fire used for resource benefit. Based on prescribed fires in ponderosa pine, Randall-Parker and Miller (2002) documented a loss of 35 percent of snags and 50 percent CWD.

MSO prey species are expected to recover to pre-fire levels after one typical growing season, with MSO perhaps benefiting from a more open understory for hunting.

CUMULATIVE EFFECTS

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

Because the action area lands are managed by the Department of the Interior, National Park Service, activities with the potential to affect listed species are Federal activities and subject to the section 7 consultation process (as described in the Act). Private and State lands that surround SNP within 0.25 mile are experiencing rapid and desert-consuming residential and commercial growth that further isolates the park and the plant and wildlife species it supports.

CONCLUSION

CFPO

After reviewing the current status of the CFPO, the environmental baseline for the action area, the effects of the proposed FMP and the cumulative effects, it is our biological opinion that the SNP FMP, as proposed, is neither likely to jeopardize the continued existence of the CFPO, nor likely to destroy or adversely modify its proposed critical habitat. We note that this biological opinion does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 C.F.R. 402.02; instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat. We present these conclusions for the following reasons:

- CFPO surveys are regularly conducted and will continue to be conducted; if CFPO are found they will be protected to the greatest extent possible.
- One CFPO has been documented (non-nesting) within SNP since 1994 continuing surveys for the species.
- CFPO proposed critical habitat is located in areas that are not to be burned by the FMP; wildfires that occur in these areas will be immediately acted upon for suppression and protected from fire effects.

LLNB

After reviewing the current status of the LLNB, the environmental baseline for the action area, the effects of the proposed FMP and the cumulative effects, it is our biological opinion that the SNP FMP, as proposed, is not likely to jeopardize the continued existence of the LLNB. Critical habitat is not designated for this species; therefore, none will be affected. We present these conclusions for the following reasons:

- SNP documented LLNBs in the one known Park roost site.
- The known LLNB roost will not be disturbed by FMP operations.
- LLNB surveys will continue to be conducted in SNP.
- LLNB food sources (saguaros and the vast majority of agaves in the action area) are in those low desert areas that are not to be burned and are to be protected from any fire.

MSO

After reviewing the current status of the MSO, the environmental baseline for the action area, the effects of the proposed FMP and the cumulative effects, it is our biological opinion that the SNP FMP, as proposed, is not likely to jeopardize the continued existence of the MSO or adversely modify its designated critical habitat. We note that this biological opinion does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the

following analysis with respect to critical habitat. We present these conclusions for the following reasons:

- MSO reproductive and presence surveys (and additional studies on SNP MSO) were conducted from 1972 to 2004 at SNP and used to designate PACs and 100-acre core areas prior to all fire operations.
- Fire events that occur within MSO habitat will be kept within the pre-designated prescriptions of low-heat, low-flame height, low-duration ground, and understory-type fire situations. Suppression actions will be taken against fires out of prescription.
- Adverse effects (localized, reduced number and distribution of MSO prey species, noise, smoke, heat) are likely to remain short-term (one growing season).
- Adverse effects that will occur later in time (re-entries for fires, noise, smoke, and heat) will also be short-term in time (one week or less) and decrease in intensity over time.
- Initial short-term (immediate and one year post-fire) adverse effects will give way to long-term (beginning in year one and continuing) beneficial effects (post-growing season increased grass and forb regeneration, greater numbers and distribution of MSO prey species, and a lessened threat of loss of nesting habitat to catastrophic fire events).

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

INCIDENTAL TAKE STATEMENT

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

The measures described below are non-discretionary, and must be undertaken by SNP so that they become binding conditions of any grant or permit issued to SNP, as appropriate, for the exemption in section 7(o)(2) to apply. SNP has a continuing duty to regulate the activity covered

by this incidental take statement. If SNP (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, SNP must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

CFPO

We do not anticipate the proposed action will result in incidental take of CFPO. Our reasons are:

- Years of surveys have resulted in a single detection of one non-nesting CFPO in the park.
- Prescribed fires will not be implemented in the low desert or in any CFPO proposed critical habitat.
- Fires in the low desert (and CFPO potential habitat) will be suppressed and CFPO habitat will be fire-protected.

LLNB

We do not anticipate the proposed action will result in incidental take of LLNB. Our reasons are:

- SNP has been and continues to be surveyed; the one known day roost is protected from fire operations.
- Saguaros and the vast majority of agaves occur in the low desert. These lands will be fire-protected and not allowed to burn. Suppression tactics in these lands are anticipated to mainly be water treatments from on-road fire engines.
- Smaller numbers of agaves existing in the higher elevations are scattered throughout the landscape and will likely experience fire that will be kept within low-intensity prescriptions. Some losses may occur if agaves are small, clumped together, or surrounded by high amounts of fine fuels. We believe these losses to be insignificant to the LLNB when measured against the remaining, easily accessible resources and the few documented LLNBs in SNP.

MSO

Incidental take of MSO can be anticipated to result from significant reduction or loss of MSO prey species for longer than one year or one growing season, post-fire; significant (greater than three acres) overstory canopy openings resulting from prescribed fire or wildland fire use for resource benefits; and loss of a vast majority of large diameter (greater than 12 inches mid-point)

dead and down logs or large (greater than 12 inches dbh) snags in the immediate (100 yards) vicinity of a known roost or nest site.

We anticipate incidental take from harm (from burnout operations) is likely to occur to one breeding adult MSO and associated eggs or young, one year, in one MSO PAC, during the life of the FMP (10 years). We also anticipate incidental take from harassment is likely to occur to one pair of adult MSO with associated eggs or young, each year, in one MSO PAC, for the life of the FMP (10 years).

We 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.

EFFECT OF THE TAKE

In this biological opinion, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the species or destruction.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

MSO

SNP has incorporated conservation measures and minimization actions, including monitoring of take and an Annual Report, that will reduce the effects of the proposed action on the listed species as much as can be accomplished without making a major change in the proposed action. We are aware of no other actions SNP could take at this time to minimize incidental take of MSO.

Review requirement: If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring reinitiation of consultation (see Reinitiation Notice, below) and review of the reasonable and prudent measures provided. SNP must immediately provide an explanation of the causes of the taking and review with the AESO the need for possible modification of the reasonable and prudent measures.

Disposition of Dead or Injured Listed Species

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

CONSERVATION RECOMMENDATIONS

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

We recommend that SNP:

- continue to implement the MSO Recovery Plan,
- assist with the creation and implementation of a recovery plan for the CFPO, and
- assist with updating the status of the LLNB.

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

REINITIATION NOTICE

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

Thank you for your continued coordination. No further section 7 consultation is required for this project at this time. Should project plans change, or if information on the distribution or abundance of listed species or critical habitat becomes available, this determination may need to be reconsidered. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department. In all future correspondence on this project, please refer to consultation number 02-21-05-F-0238. Should you require further assistance or if you have any questions, please contact Thetis Gamberg at (520) 670-6150 (x231) or Jim Rorabaugh at (602) 242-0210 (x238) of my staff.

/s/ Steven L. Spangle

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
 Field Supervisor, Fish and Wildlife Service, Albuquerque, NM (Susan MacMullin)
 Assistant Supervisor, Fish and Wildlife Service, Flagstaff, AZ (Attn: Shaula Hedwall)

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ (Attn: Bob Broscheid)
 Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ (Attn: Joan Scott)
 Forest Supervisor, Coronado National Forest, Tucson, AZ (Attn: Tom Skinner)
 Email to: Paula Medlock: pmedlock@fs.fed.us

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TABLES AND FIGURES

Figure 1. SNP Prescribed Burn Units - Previous Treatments and Tentative Scheduled Treatments.		
Prescribed burn unit name	Year last burned	Year tentatively scheduled to burn
Chimenea	1998	2007
Devil's Bathtub	2004	
Mica Bowl	2002 (all subunits)	2009
Duckbill (subunit)	1994	
Spud Rock (subunit)	1996	
Mica Meadow (subunit)	1996	
North Slope	2003 (in Helens2 wildfire)	2008
East Slope	1994	2006

Table STOC-1. Documentation of "best"* MSO occurrence at five PACs in Saguaro National Park between 1992 and 2004.					
Year	Italian Springs	Helens Dome	Spud Rock	Reef Rock	Rincon Peak
1992	Male	Male	Pair	No detections	no detections
1993					
1994					
1995					
1996	Pair	Pair	Pair	2 fledglings	Pair
1997	2 fledglings	Pair?	Pair?	Pair?	Pair?
1998	1 fledgling	Pair	Pair	2 fledglings	
1999	1 fledgling	2 fledglings	1 fledgling	2 fledglings	
2000					
2001					
2002	1 fledgling	Pair	Pair	Male	
2003	No detections	Male	one adult, no sex id	Pair	
2004	Pair	1 fledgling	Pair	Male	
* "best" detection is based on the following hierarchy: fledgling is better than → nesting is better than → pair is better than → single adult is better than → no owls detected is better than → no data (PAC not visited, table cell is blank).					

PAC Name	Total PAC acreage	PAC core acreage	PAC Acreage outside of core
Italian Springs	598	90	508
Helen's Dome	662	81	581
Spud Rock	601	79	523
Reef Rock	615	94	521
Rincon Peak	600	70 + 30	500

Fire Identification	Year	Acres of PAC impacted*	Percent of PAC impacted*
MANNING_CAMP	1943	454	76
Rincon	1994	368	62
Mica Meadow 96	1996	1	0
Mica Bowl 02	2002	0	0
Helens2	2003	493	82
Turtle North	2004	0	0

* Overlap between fire perimeter and PAC perimeter; actual impacts to habitat are variable with fire intensity and would not necessarily translate to an ESA "effect" on spotted owls or critical habitat.

Fire Identification	Year	Acres of PAC impacted*	Percent of PAC impacted*
HELENS_DOME_2	1972	97	15
HELENS_DOME_SOUTH	1972	16	2
CHIVA	1989	39	6
Lucky	1992	21	3
Chimenea 98	1998	27	4
Helens2	2003	588	89

* Overlap between fire perimeter and PAC perimeter; actual impacts to habitat are variable with fire intensity and would not necessarily translate to an ESA "effect" on spotted owls or critical habitat.

Table STOC-5. Fire Impacts* to Spud Rock PAC from 1943 to 2004. Also see Figures STOC-2 and STOC-5.			
Fire Identification	Year	Acres of PAC impacted*	Percent of PAC impacted*
MANNING CAMP	1943	195	32
MANNING	1985	1	0
JUNCTION	1988	116	19
DUCKBILL	1993	42	7
SPUD ROCK	1993	42	7
Duckbill 94	1994	21	3
Mica Meadow 96	1996	17	3
Spud Rock 96	1996	211	35
Chimenea 98	1998	89	15
Helens	2000	1	0
Mica Bowl 02	2002	241	40
Helens2	2003	284	47
* Overlap between fire perimeter and PAC perimeter; actual impacts to habitat are variable with fire intensity and would not necessarily translate to an ESA “effect” on spotted owls or critical habitat.			

Table STOC-6. Fire Impacts* to Reef Rock PAC from 1943 to 2004. Also see Figures STOC-2, STOC-6a and STOC-6b. Note the time gap between 1972 and 1986 is when there were no fires at Reef Rock.			
Fire Identification	Year	Acres of PAC impacted*	Percent of PAC impacted*
MANNING CAMP	1943	615	100
SPUD ROCK 1	1950	422	69
RINCON	1954	326	53
SPUD ROCK CABIN	1956	232	38
FOUR CORNERS	1972	498	81
HEARTBREAK	1986	7	1
CABIN	1988	196	32
SPUD ROCK	1993	351	57
Rincon	1994	527	86
Devils Bathtub 97	1997	139	23
Deer	2003	31	5
Devils Bathtub 04	2004	139	23
* Overlap between fire perimeter and PAC perimeter; actual impacts to habitat are variable with fire intensity and would not necessarily translate to an ESA “effect” on spotted owls or critical habitat.			

Table STOC-7. Fire Impacts* to Rincon Peak PAC from 1943 to 2004. Also see Figures STOC-2 and STOC-7.			
Fire Identification	Year	Acres of PAC impacted*	Percent of PAC impacted*
SUNSET	1988	52	9
* Overlap between fire perimeter and PAC perimeter; actual impacts to habitat are variable with fire intensity and would not necessarily translate to an ESA “effect” on spotted owls or critical habitat.			

Table STOC-8. Impacts of Prescribed Burns* to Italian Springs PAC. ¹ Acreage within PAC, but outside of core; ² Percentage of PAC outside of core; ³ Acreage in PAC core; ⁴ Percentage of PAC core							
East Slope Burn – 421 acres total				Mica Bowl Burn** - 545 acres total			
PAC Acreage ¹	PAC Percentage ²	Core acreage ³	Core percentage ⁴	PAC Acreage ¹	PAC Percentage ²	Core acreage ³	Core percentage ⁴
2	<1%	0	0%	<1	0%	0	0%
North Slope Burn - 4258 acres total							
PAC Acreage ¹	PAC Percentage ²	Core acreage ³	Core percentage ⁴				
473	79%	90	100%				
<p>*Impacts are merely as estimate of overlap between the PAC, based on the burn boundary presented in 2005 FMP. Actual burn boundary may change as a result of other fires, or management decisions. Changes should be documented in FMP Implementation Annual Report to FWS.</p> <p>** Mica Bowl Burn previously existed as three sub-units titled “Duck Bill”, “Mica Bowl”, and “Mica Meadow”, as shown in Figure STOC-2.</p>							

Table STOC-9. Impacts of Prescribed Burns* to Helen's Dome PAC.

¹Acreage within PAC, but outside of core; ²Percentage of PAC outside of core; ³Acreage in PAC core; ⁴Percentage of PAC core

Chimenea Burn – approximately 2000 acres				North Slope Burn - 4258 acres total			
PAC Acreage ¹	PAC Percentage ²	Core acreage ³	Core percentage ⁴	PAC Acreage ¹	PAC Percentage ²	Core acreage ³	Core percentage ⁴
27	5%	0	0%	636	96%	81	100%

*** Impacts are merely as estimate of overlap between the PAC, based on the burn boundary presented in 2005 FMP. Actual burn boundary may change as a result of other fires, or management decisions. Changes should be documented in FMP Implementation Annual Report to FWS.**

Table STOC-10. Impacts of Prescribed Burns* to Reef Rock PAC.

¹Acreage within PAC, but outside of core; ²Percentage of PAC outside of core; ³Acreage in PAC core; ⁴Percentage of PAC core

Devils Bathtub Burn - 595 acres total				East Slope Burn – 421 acres total			
PAC Acreage ¹	PAC Percentage ²	Core acreage ³	Core percentage ⁴	PAC Acreage ¹	PAC Percentage ²	Core acreage ³	Core percentage ⁴
139	27%	14	15%	141	27%	52	55%

*** Impacts are merely as estimate of overlap between the PAC, based on the burn boundary presented in 2005 FMP. Actual burn boundary may change as a result of other fires, or management decisions. Changes should be documented in FMP Implementation Annual Report to FWS.**

Table STOC-11. Impacts of Prescribed Burns* to Spud Rock PAC.

¹Acreage within PAC, but outside of core; ²Percentage of PAC outside of core; ³Acreage in PAC core; ⁴Percentage of PAC core

Chimenea – approximately 2000 acres total				North Slope Burn – 4258 acres total			
PAC Acreage ¹	PAC Percentage ²	Core acreage ³	Core percentage ⁴	PAC Acreage ¹	PAC Percentage ²	Core acreage ³	Core percentage ⁴
89	17%	0	0%	262	50%	70	88%

*** Impacts are merely as estimate of overlap between the PAC, based on the burn boundary presented in 2005 FMP. Actual burn boundary may change as a result of other fires, or management decisions. Changes should be documented in FMP Implementation Annual Report to FWS.**

Table STOC-12. Prescribed Burn Units Defined as of Spring 2005, and burning effects anticipated to MSO PACs.	
Chimenea	Overlays parts of two PACs; no core acreage affected
Devil's Bathtub	Overlays part of one PAC; 15% of a core area is affected
Mica Bowl	Overlays part of one PAC; no core acreage affected
East Slope	Overlays parts of two PACs; 55% of one core affected
North Slope	Overlays part of three PACs; 100% of two core areas and 88% of third core area affected
Saddle	See consultation number: 02-21-

NOTE: Saddle is the sixth burn unit; it is not included in the scope of this FMP at this time. It is being consulted on separately for implementation prior to completion of this FMP consultation.

APPENDIX A

CONCURRENCES

We concur with your “may affect, not likely to adversely affect” determination for the following reasons:

Gila topminnow

- Despite years of surveys and habitat assessment, Gila topminnows are not currently found in or downstream of the action area, although documentation exists of their historical occurrence. Surveys will continue. Any effects from the proposed action are insignificant and discountable.

Jaguar

- The likelihood of any direct or indirect interaction between the proposed action and the species is extremely low due to the animal’s rare visits, mobility, and human avoidance traits. Any effects from the proposed action are discountable.

Pima pineapple

- Despite years of surveys and habitat assessment, PPC has not been documented in the action area to date. Surveys continue in potential areas that may support PPC. Any effects from the proposed action are discountable.

Southwestern willow flycatcher. Critical habitat has been designated for the SWFL; however, none occurs within SNP and none will be affected by this proposed project.

- Despite years of surveys and habitat assessment, SWFL has not been documented to occur in the action area, although suitable habitat exists. That habitat is in the low desert and will not be burned; suppression will occur in this area. Surveys for SWFL continue. Any effects from the proposed action are discountable.

APPENDIX B

SNP FMP ANNUAL REPORT

NOTE: Appendixes B and C were written by SNP staff and are included here as they appear in the BA.

A conservation measure to be implemented in conjunction with the SNP FMP is a series of Annual Reports (Report) to document new or changed information pertinent to fire management and T&E species. The purpose of the Report is to provide information and a process to determine whether the changes in habitat conditions as a result of implementing the Fire Management Plan are within the expected effects documented in this Section 7 consultation. The consultation for the FMP was performed with the best information available at the time, but improvements to information commonly occur. The Report will also reflect incremental improvements to the knowledge of the environmental baseline at Saguaro (see Examples below). The Report will also be essential to the “adaptive management” of the FMP.

The Annual Report will be prepared jointly by the Fire Management and Resource Management staffs of SNP, beginning in the winter of 2005-2006, and yearly through the life of the Plan. The Report will be delivered to the Tucson Field Office of the Fish and Wildlife Service. A meeting to discuss the content and format of the Annual Report will be arranged if either the Fish and Wildlife Service or the Saguaro staffs believe it necessary. Regardless of whether a meeting is held, the two agency staffs will jointly agree on interpretations of the information and determine if changes are needed in either the FMP implementation or the Section 7 consultation for the FMP.

The Annual Report will consist of three parts. The first part will describe what fires occurred at the park, and what was the effect of those fires and associated fire management activities on T&E species and their habitat. The second part will outline the FMP plans for the following fire season, based upon the environmental conditions from the previous fire season. The final part will summarize and document recommendations of the fire and natural resources staffs. These three parts should be considered “Draft” until the first Annual Report is completed, at which time a final Report format will be agreed upon. For example, it is possible that other reports already required of the fire program may contain sufficient information without having to generate a new summary for the Annual Report.

Part 1 – What happened in previous fire season

The following information will be reported, as appropriate for all three types of fires - Wildlands Fire Suppression, Wildland Fire Use For Resource Benefit, and Prescribed Fire.

- Number, size and location of fires – generate a map, acreage estimates, and brief narrative for each fire (ignition source, dates, type of fire, etc.)

- Fire behavior and burn severity data – general discussion of behavior and, if available, a map of burn severity overlaying the vegetation types addressed in this consultation.
- Suppression actions taken and their effect on habitat (T&E habitat and general habitat conditions)
 - Fireline location and length.
 - Estimated number of live trees and snags cut during suppression (presented in two size classes - greater than 18 inches dbh and less than 18 inches dbh).
 - Description, location and size estimate of new fire support sites such as camp sites, helispots, and drop points. Same information for re-use of existing sites. Including brief description of the effect of the activity on habitat/vegetation.
 - Number of flights, by aircraft types, over and around the incident.
 - Number, size and location of water/retardant drops and whether Conservation Measures to protect sensitive watercourses were achieved.
- Observations and documentation of T&E species seen during fire suppression work and any notes on the behavior of those species.
- Documentation of any species or habitat surveys conducted in or near the park, and results of those surveys. Also, any incidental sightings or detections of T&E species.
- Fire effects data before and after (All prescribed fires; other fires, if available)
 - Map of plot locations in relation to T&E habitat
 - Data from plots
 - Analysis of plot data in regards to T&E species habitat components
- Park biologist's summary and interpretation of the effects of all above on T&E species and their habitats. Including a determination as to whether the effects are within the consultation expectations for the FMP.

Fire name/identification	Dates of ignition and control	Total Fire size	Description and amount of burn severity within the perimeter	Vegetation condition before and after fire (whether suitable for __ species)

Part 2 – What is planned and expected in the subsequent fire season

The Report will provide details for the following year’s proposed FMP activities, to the extent possible.

- Plans for prescribed burning and whether there are any proposed changes from what was described in previous documents.
- Any proposed changes to the WFIP decision criteria.
- Any T&E species surveys or habitat surveys planned for FMP or other activities.

Part 3 – Conclusion and Recommendations

The Report will conclude with recommendations for subsequent implementation of the FMP. It will also convey pertinent consultation documentation, including:

- For fire suppression events that may have affected a listed species and/or resulted in incidental take:
 - A determination whether the fire suppression actions were consistent with the biological opinion. Include a request to append the report to the biological opinion and the associated incidental take statement, as appropriate, to fulfill consultation requirements for that fire event.
 - Description of the coordination with FWS during the fire event, the fire suppression actions that were taken, and the location and timing of these actions.
 - Describe implementation of relevant conservation measures, reasonable and prudent measures, and terms and conditions.
 - Describe any additional avoidance or minimization measures that were implemented during the suppression activities.

- Include an analysis of the effects of the actions on listed species and/or designated critical habitats. Describe any take that may have occurred as a result of the fire suppression activities.
- For wildland fire events that may have affected a listed species and/or resulted in incidental take:
 - A determination whether the fire impacts to habitat were consistent with the biological assessment (acreage, burn severity, timing, etc.). Include a request to append the report to the biological opinion and the associated incidental take statement, as appropriate, to fulfill consultation requirements for that fire event.
 - Description of the coordination with FWS during the fire event, the fire suppression actions that were taken, and the location and timing of these actions.
 - Describe implementation of relevant conservation measures, reasonable and prudent measures, and terms and conditions.
 - Describe any additional avoidance or minimization measures that were implemented during the suppression activities.
 - Include an analysis of the effects of the fire impacts and any suppression actions on listed species and/or designated critical habitats. Describe any take that may have occurred as a result of the fire suppression activities. Quantify the habitat impacts as an adjustment to the environmental baseline for the park.
- For prescribed burn events that may have affected a listed species and/or resulted in incidental take:
 - A determination whether the burns were consistent with the biological opinion. Include a request to append the report to the biological opinion and the associated incidental take statement, as appropriate, to fulfill consultation requirements for that burn event.
 - Description of the coordination with FWS during the fire event, the fire suppression actions that were taken, and the location and timing of these actions.
 - Describe implementation of relevant conservation measures, reasonable and prudent measures, and terms and conditions.
 - Fire Effects Plot data prior to, and after, the burn.
 - Describe any additional avoidance or minimization measures that were implemented during the suppression activities.

- Include an analysis of the effects of the burns on listed species and/or designated critical habitats. Describe any take that may have occurred as a result of the activities.

**Information to be Developed for Saguaro FMP Annual Report the
Winter of 2005/2006**

The first year of implementation of the FMP will be an opportunity to assemble information that was not available for the Biological Assessment. This information will clarify the baseline for the FMP consultation.

Based on the first 6 months of FMP implementation there are some topics which may warrant further attention:

- Clarify the Conservation Measures – does park staff understand the intent and implementation of each CM? Is there sufficient funding to perform the CMs?

The following examples could potentially be developed for the first Annual Report:

Example 1 – Maps and fire severity data to better quantify impacts of pre-2005 fires to Saguaro spotted owl habitat (both within PACs and outside of PACs). The maps and data for the BA were general; they did not include severity (which may be available for some fires) and they were not overlaid with actual habitat (see items 4 and 5, below).

Example 2 – Summary of Fire Effects Data, by plot location, since conception of the Fire Effects Program; For all plot locations.

Example 3 – Map of Fire Effects Plot locations in relation to vegetation considered suitable habitat for Mexican spotted owls.

Example 4 – Use new vegetation data to generate a more accurate map of potential habitat for T&E species.

Example 5 – After Example 4, remap PACs, if this is acceptable under the revised owl recovery plan.

Example 6 – Correct digital boundaries of prescribed burns and re-run data based on new boundaries.

Example 7 – Analyze Fire Effects Data in relation to owl PACs.

Example 8 – Develop a Natural Resources Component for the FMP similar to the Cultural Resources Component in the Draft FMP EIS.

Example 9 – Transfer all spotted owl survey points, owl locations and prey collection data into a geodatabase to serve as a permanent record. Link the 2004 photos with photopoints.

Example 10 – Transfer all pygmy owl survey data (locations and effort) into a geodatabase to serve as a permanent record.

Example 11 – Meet with biologists from adjacent Forest Service acreages, acquire their spotted owl location data and habitat data, to create a more complete view of the owl metapopulation. Compare notes and plans with them to assure the two land managers are not putting undue pressure on the owls by planning co-incident prescribed burns.

Example 12 – A summary of the Mexican spotted owl prey data which was collected in the 1990s in relation to Fire Effects Plot data.

Example 13 – A summary of the cactus ferruginous pygmy owl surveys that have been done – maps of acreage surveyed, with dates, results, etc.

Example 14 – A summary of the Chiricahua leopard frog surveys that have been done – maps of acreage surveyed, with dates, results, etc.

APPENDIX C

CONSERVATION MEASURES FOR SAGUARO FIRE MANAGEMENT PLAN

The following conservation measures are specifically intended to reduce effects to listed species. The EIS lists a series of conservation measures (EIS pages 38-39). The following Conservation Measures will be included as part of the FMP.

The following conservation measures are to be implemented only to the extent that doing so will not compromise human health and safety.

For all Federally listed species

- At least one National Park Service Resource Advisor (biologist) will be on-site to ensure fire operations maintain sensitivity to ecological concerns. Fire management staff will consult park biologists when making decisions about wildland fire use and fire suppression when habitat of listed species is involved.
- In the winter of each year, SNP will prepare a report (Appendix 1 of the BA) detailing that calendar year's actions involving prescribed fires, wildland fires and emergency wildfire suppression. The report will describe the fires and their associated actions, known impacts on threatened and endangered species, implementation and effectiveness of the conservation measures, quantification of any incidental take, and rehabilitation actions completed. It will summarize monitoring data on fire behavior and fire effects on vegetative/habitat characteristics as a source of information for potential adaptive management changes to the FMP. The report will also describe the FMP activities anticipated for the next fire season. Finally, the report will document any adjustments to the FMP which the park staff deems appropriate, per the adaptive management intent of the FMP. The report will be delivered to FWS and, if needed, a meeting will be held between the park and the FWS to agree upon adjustments to the FMP (such as the prescribed burning prescriptions) or to aspects of implementing the FMP.
- In the event of a wildland fire, SNP will notify FWS of the event and enter into emergency consultation, as appropriate.

Conservation Measures for cactus ferruginous pygmy-owl

- Compile past survey efforts into a format which can be referenced by the fire staff in the case of a suppression fire in pygmy owl habitat.
- Consult park records of pygmy owl habitat and surveys to minimize fire suppression effects on those sensitive resources.

Conservation Measures for lesser long-nosed bat

- Conduct surveys to determine the location and bat use of possible roosts at SNP. Surveys may not be directly associated with FMP activities but will contribute to the overall understanding of bat use of the area and to the FMP implementation.

- Compile bat survey results into a format for reference by fire staff.
- Protect agave plants from modifications by treatment activities to the greatest extent possible in areas of low agave density.
- Instruct personnel implementing prescribed fires in the identification and importance of protecting agave plants for bats.
- Monitor agaves so that there is no more than 20% agave mortality in a burn area over the life of the Fire Management Plan. Monitor spread of Lehmann lovegrass changes in density and distribution after burns.

For Mexican spotted owl and spotted owl critical habitat

- Every three years, SNP will conduct surveys of all spotted owl habitat in the park to document the presence of owls. They will use the survey protocol recommended at the time of survey. The first priority is to document continued presence of owls in the five PACs. Second priority would be survey of non-PAC owl habitat to document whether additional owl pairs have become established in the parks. Third priority would depend on whether sufficient funds exist, and would determine reproduction of any owls found.
- The Fire Effects plot data will be analyzed to understand the changes in fuels conditions in owl habitat (inside and outside of PACs) through time.
- Implement prescribed fire and wildland fire use prescriptions to achieve low (preferably) and moderate (when necessary to achieve goals) intensity burns in Ponderosa pine, Pine with Mixed Conifers and Hardwoods, and Mix Oaks vegetation types.
- Any first entry prescribed burn will be low-intensity, to consume surface fuels in order to reduce risk of catastrophic stand-replacing fire. Manually reduce fuels that may contribute to a catastrophic fire, if necessary.
- Any re-entry prescribed burn in and adjacent to the PACs will be low-intensity to consume dead and downed fuels as well as to clear understory vegetation that may contribute to a catastrophic fire.
- Prescribed burns will minimize heat impacts to the MSO and known and possible nest sites by conducting low-intensity prescribed burns and wildland fire use that will have slow rates of spread and low flame lengths in the most sensitive areas. Flame lengths will be kept low below known and possible spotted owl nest sites by varying ignition patterns, excluding those areas from ignition, rearranging fuels to facilitate low-intensity burning, and/or burning in cooler months where fire behavior is less extreme.

- Conduct prescribed fire, wildland fire, and mechanical thinning treatments to minimize effects on owl reproduction (flushing of adults from a nest, etc.); avoid actions with known potential for negative effects.
- Use prescribed fire and wildland fire to maintain and enhance MSO habitat inside and outside of the PACs by varying the management prescriptions to (a) reproduce natural disturbance patterns; (b) maintain all species of native vegetation in the landscape, including early seral species; (c) allow natural gap processes to occur, thus producing horizontal variation in stand structure; and (d) promote the growth of additional large trees by thinning understory vegetation through the use of moderate-intensity burning and by pre-treating large trees (ringing, foam, limbing) if those actions are deemed necessary.
- Follow the MSO Recovery Plan (RP) (U. S. Fish and Wildlife Service 1995) guidelines in setting project objectives: (a) minimize cutting of trees and snags larger than 18 inches dbh, and avoid altogether cutting trees or snags larger than 24 inches DBH (exceptions can be made when absolutely necessary for safety reasons) and (b) thin trees measuring up to 9 inches DBH. The RP specifies retaining a majority of large down logs
- Delineate maximum manageable areas (MMAs) to avoid impacts to sensitive areas. An MMA is a large perimeter within which fire is allowed to spread before suppression action must be taken. It is not actively ignited during a prescribed burn, and it allows for setting up the trigger points that will drive management actions based on resource values.
- Adhere to Arizona Department of Environmental Quality air quality standards. Use small-scale ignition to reduce temporary smoke impacts to the MSO. Limit the number of acres burned per day as well as the burn duration to ameliorate smoke impacts to spotted owls. Attempt to manage all fires to use favorable transport winds to move smoke up and away from the PACs, and especially from known nest sites.
- To the extent possible, locate fire management staging areas and other fire “activity centers” outside of designated MSO PACs.
- To the extent possible, avoid aircraft flight closer than 1,000 feet over MSO PAC boundaries.
- Limit retardant drops on the perimeter of and within the PACs. Do not drop retardant or water on known or suspected nests.
- If a spotted owl is located during fire operations: a) request advice from the park biologist, b) adjust fire management activities, if necessary and if possible, to minimize impacting owl reproduction, c) instruct fire crew members to neither approach nor haze any owls they find. Report on these actions in the annual report.

Conservation Measures for Southwestern willow flycatcher, Gila topminnow, and Chiricahua leopard frog

- Develop clear instructions for fire staff to accomplish protection of aquatic and riparian habitats throughout the park.

Conservation Measures for Pima pineapple cactus

- As funds are available, continue surveys for the cactus to determine if the species is absent from the park.
- Work with FWS to determine if introduction of the species to the park is appropriate.

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