



United States Department of the Interior

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FILE COPY

In Reply Refer to:

AESO/SE
02-21-02-F-0225

September 24, 2003

Ms. Elaine J. Zieroth
Forest Supervisor
Apache-Sitgreaves National Forest
P.O. Box 640
Springerville, Arizona 85938-0640

RE: Burn Area Emergency Rehabilitation Consultation for the Rodeo-Chediski Fire (Your File 2670)

Dear Ms. Zieroth:

Thank you for your request for consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request for formal consultation was dated November 21, 2002, and received by us on November 22, 2002. At issue are impacts that may have resulted or may yet result from the proposed emergency rehabilitation of areas burned by the Rodeo-Chediski fire in portions of Coconino, Gila, and Navajo counties, Arizona. Your office concluded that the proposed action may affect, but is not likely to adversely affect, bald eagles (*Haliaeetus leucocephalus*), Little Colorado spinedace (*Lepidomeda vittata*), or Chiricahua leopard frogs (*Rana chiricahuensis*). Concurrences for these species are included in Appendix A. Your office similarly concluded that the proposed action may affect, but is not likely to adversely affect, Mexican spotted owls (*Strix occidentalis lucida*). We have notified your staff that we are not able to concur with this conclusion, and have been requested by them to continue with formal consultation for the Mexican spotted owl.

This biological opinion is based on information provided in the November 21, 2002, biological assessment and evaluation (BAE), the July 29, 2002, BAER Team Executive Summary and Specialists Reports, the undated Interagency BAER Rodeo-Chediski Fire Complex Wildlife Resource Assessment, various e-mails and telephone conversations with your staff, maps provided by your office, and field investigations on September 12 and 13, 2002. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, wildfire suppression and rehabilitation and their effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation History

- We were contacted by your staff on June 26, 2002, regarding emergency consultation for both the emergency suppression and emergency short-term rehabilitation for the Rodeo-Chediski Fire.

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We replied in writing on June 26, 2002, confirming initiation of emergency consultation procedures. This letter covered activities conducted under the Burned Area Emergency Rehabilitation efforts for the first two months following the fire.

- A field visit was conducted on September 12 - 13, 2002. We received maps of the Rodeo-Chediski Fire and rehabilitation actions on that date. We received a copy of the July 29, 2002, BAER Team Executive Summary and Specialists Reports on July 29, 2002, as well as a draft BAE for the BAER on August 8, 2002.
- We have communicated with your staff via e-mails, meetings (September 12 - 13, 2002) and telephone conversations.
- A 30-day letter was sent to your office initiating formal consultation for this project on January 2, 2002. Subsequently, additional information was requested from your staff, and this information was provided via e-mail and hard copy maps on July 7, 2003. We notified Brian Dykstra of your staff that the delay in receipt of this information would delay our response. The new 135-day consultation period would therefore end on November 19, 2003. Following a phone call from your staff on September 9, 2003, however, a new due date of September 30, 2003 was requested.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

As noted in the consultation history, your staff contacted this office on June 26, 2002, and we responded to the Forest on that same date indicating that emergency consultation procedures would be followed to handle short-term rehabilitation efforts for the Rodeo-Chediski fire. The proposed action involves two phases: 1) actions already completed on the ground, and; 2) actions to be completed or funded by September 2003. Those actions completed on the ground are considered part of the emergency consultation. As dictated by emergency consultation procedures, a take statement will be provided for this project, but no reasonable and prudent measures or terms and conditions have been developed. Those actions yet to be completed are still considered related to the emergency, but not part of the emergency work. They will be considered in this opinion as well; however, because they are of a non-emergency nature, reasonable and prudent measures and terms and conditions will be provided. The remainder of this document will address the actions completed and those yet to be completed separately, as needed.

The Forest Service describes the Rodeo-Chediski fire as a plume, fuel, and topographically driven fire. Plume dominated fires are extremely rare in the Southwest. Towering plumes developed in part due to the availability of fuel due to low live fuel mixtures. The fire moved more rapidly once these plumes collapsed. The fire spread at rates of 45 to 65 acres a minute, and included 400 foot flame lengths, group torching, dependent crown fire development, and

spotting up to one mile from the fire's perimeter. Spot fires quickly gained size as they spread (USFS 2002). The Rodeo-Chediski Fire burned a total of approximately 462,384 acres between June 18 and July 8, 2002, and was the largest and most intense post-settlement fire in Arizona history. Of the total acreage, 10,783 acres are on the Tonto National Forest, and 164,644 acres are on the Apache-Sitgreaves National Forest. The remaining acreage is on the White Mountain Apache Reservation (278,183 acres) or private lands (8,774 acres). The action area for this consultation addresses only those portions of the Rodeo-Chediski Fire that occur on Forest Service lands (Figure 1 in Appendix B).

Treatments under this emergency rehabilitation project include aerial seeding, hand seeding, aerial hydro mulching, ground mulching with straw or wood chips, directional tree felling, channel clearing, wet meadow protection, and road maintenance. A breakdown of treatments occurring within Mexican spotted owl Protected Activity Centers (PACs) was provided in Appendix A of the BAE, and is incorporated herein by reference.

Aerial Seeding - Aerial seeding was and will continue to be applied with fixed-wing airplanes and helicopters at a rate of approximately 30 pounds to the acre over approximately 50,000 acres. Planes apply seed cover in strips of approximately 70 feet per pass and fly at an altitude of approximately 400 feet above ground level. The seed mix consists of annual rye, annual barley, mountain brome, and slender wheatgrass. Aerial seeding occurs only in areas that were severely burned.

Completed: As of October 2, 2002, the Forest Service completed aerial seeding of 48,796 acres, including 4,153 acres within Mexican spotted owl PACs using both airplanes and helicopters.

To Be Completed: Additional aerial seeding will occur as funding becomes available. Ultimately, aerial seeding will be applied to another 3,800 acres, with 900 acres of that occurring in Mexican spotted owl PACs.

Hand Seeding - Hand seeding will use native seeds, and will occur when funding becomes available. Hand seeding will occur only in areas of moderate and high burn severity where crews can work safely. Seed would be applied by 20 person crews at a production rate of approximately 160 acres per day. A breakdown of hand seeding acres by PAC is provided in Appendix B of the BAE, and is incorporated herein by reference.

Completed: To date, no hand seeding has been completed.

To Be Completed: Approximately 710 acres on the Tonto National Forest.

Aerial Mulching - The BAE notes that aerial application of straw mulch has occurred throughout the burned area and may be used on additional acreage within the burned area, including PACs. Your staff are currently assessing which areas were most severely burned but have not received treatment.

Completed: Aerial application of straw occurred on approximately 748 acres in various Mexican spotted owl PACs.

To Be Completed: The Forest Service anticipates completing aerial straw applications on 1,000 additional acres, in areas to be determined.

Ground Mulching - Ground mulching involves the spreading of mulch materials by hand. Your staff anticipate completing this type of work through volunteer labor along the Highway 260 corridor.

Completed: None.

To Be Completed: Approximately 1,000 acres.

Tree Felling - Tree felling replaces downed large woody debris consumed by the fire, reduces soil erosion, and helps to re-establish small mammal habitat. Three to five trees per acre will be felled in high and moderate burn severity areas where crews can work safely. All tree felling activities are planned within Mexican spotted owl PACs.

Completed: None.

To Be Completed: Approximately 1,100 acres (400 on the Apache-Sitgreaves National Forest, and 700 on the Tonto National Forest).

Channel Clearing - In addition, nine miles of channels will be cleared of debris to prevent debris dams near residential areas, and 20 acres of wet meadows may be protected with water deflection and gabion structures to reduce downcutting potential. Channel clearing involves the removal of debris that has built up as a result of the fire. Debris can include downed trees or portions of trees, brush, or other materials. None of the work in wet meadows has been completed. Your staff have identified money for construction of fencing the Gentry Meadow north of Black Canyon Lake later this summer.

Completed: 2.2 miles of channel clearing.

To Be Completed: Your staff anticipate clearing a total of up to 9.0 miles. The work completed on the first 2.2 miles may need to be redone, depending on flow events. If not, then only 6.8 miles of channel clearing remain to be done.

Culvert Removal - Your staff removed culverts and replaced them with rolling grade dips in order to decrease the chance of road damage following blockage of culverts from debris transported during high flow events following the fire. At this time, your staff do not anticipate replacing many of these culverts, but would instead leave the rolling grade dips already in place. Your staff have initiated disposal of the removed culverts.

Completed: Approximately 200 culverts.

To Be Completed: None

Table 1 provides a comparison of rehabilitation work already completed versus that to be completed.

| Table 1. Summary of work completed and to be completed as part of the proposed action. (All figures indicate acres, except for channel clearing, which will be measured in stream miles). | | |
|---|-----------|-----------------|
| Type of Work | Completed | To Be Completed |
| Aerial Seeding | 45,847 | 3,800 |
| Hand Seeding | 0 | 1,700 |
| Aerial Application of Straw | 748 | 1,000 |
| Ground Mulching | 0 | 1,000 |
| Tree Felling | 0 | 1,100 |
| Channel Clearing | 2.2 | 6.8 to 9.0 |
| Culverts Removed | 200+ | 0 |
| Meadow Fencing | 0 | 20 |

STATUS OF THE SPECIES (range wide and/or recovery unit)

Mexican Spotted Owl

The Mexican spotted owl was listed as a threatened species in 1993 (USFWS 1993). The primary threats to the species were cited as even-aged timber harvest and the threat of catastrophic wildfire, although grazing, recreation, and other land uses were also mentioned as possible factors influencing the MSO population. The FWS appointed the Mexican Spotted Owl Recovery Team in 1993, which produced the Recovery Plan for the Mexican Spotted Owl (Recovery Plan) in 1995 (USFWS 1995).

A detailed account of the taxonomy, biology, and reproductive characteristics of the MSO is found in the Final Rule listing the MSO as a threatened species (USFWS 1993) and in the Recovery Plan (USDI 1995). The information provided in those documents is included herein by reference. Although the MSO's entire range covers a broad area of the southwestern United States and Mexico, the MSO does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons and, in some

cases, steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older, well-structured forest, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico.

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

The Upper Gila Mountains RU is a relatively narrow band bounded on the north by the Colorado Plateau RU and to the south by the Basin and Range-West RU. The southern boundary of this RU includes the drainages below the Mogollon Rim in central and eastern Arizona. The eastern boundary extends to the Black, Mimbres, San Mateo, and Magdalena mountain ranges of New Mexico. The northern and western boundaries extend to the San Francisco Peaks and Bill Williams Mountain north and west of Flagstaff, Arizona. This is a topographically complex area consisting of steep foothills and high plateaus dissected by deep forested drainages. This RU can be considered a "transition zone" because it is an interface between two major biotic regions: the Colorado Plateau and Basin and Range Provinces (Wilson 1969). Most habitat within this RU is administered by the Kaibab, Coconino, Apache-Sitgreaves, Tonto, Cibola, and Gila National Forests. The north half of the Fort Apache and northeast corner of the San Carlos Indian reservations are located in the center of this RU and also support MSOs.

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

A reliable estimate of the numbers of owls throughout its entire range is not currently available (USDI 1995) and the quality and quantity of information regarding numbers of MSO vary by source. USDI (1991) reported a total of 2,160 owls throughout the United States. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico. However, Ganey *et al.* (2000) estimates approximately $2,950 \pm 1,067$ (SE) MSOs in the Upper Gila Mountains RU alone. The Forest Service Region 3 most recently reported a total of approximately 980 PACs

established on National Forest lands in Arizona and New Mexico (USDA Forest Service, Southwestern Region, December 19, 2002). Based on this number of MSO sites, total numbers in the United States may range from 980 individuals, assuming each known site was occupied by a single MSO, to 1,960 individuals, assuming each known site was occupied by a pair of MSOs. The Forest Service Region 3 data are the most current compiled information available to us; however, survey efforts in areas other than National Forest System lands have likely resulted in additional sites being located in all Recovery Units. Currently, we estimate that there are likely 12 PACs in Colorado (not all currently designated) and 105 PACs in Utah.

Since the owl was listed, we have completed or have in draft form a total of 119 formal consultations for the MSO. These formal consultations have identified incidences of anticipated incidental take of MSO in 289 PACs. The form of this incidental take is almost entirely harm or harassment. These consultations have primarily dealt with actions proposed by the Forest Service, Region 3. However, in addition to actions proposed by the Forest Service, Region 3, we have also reviewed the impacts of actions proposed by the Bureau of Indian Affairs, Department of Defense (including Air Force, Army, and Navy), Department of Energy, National Park Service, and Federal Highway Administration. These proposals have included timber sales, road construction, fire/ecosystem management projects (including prescribed natural and management ignited fires), livestock grazing, recreation activities, utility corridors, military and sightseeing overflights, and other activities. Only one of these projects (release of site-specific owl location information) has resulted in a biological opinion that the proposed action would likely jeopardize the continued existence of the MSO.

In 1996, the FWS issued a biological opinion on Forest Service Region 3's adoption of the Recovery Plan recommendations through an amendment of their Forest Plans. In this non-jeopardy biological opinion, we anticipated that approximately 151 PACs would be affected by activities that would result in incidental take of MSOs, with approximately 91 of those PACs located in the Upper Gila Mountains RU. In addition, we completed a reinitiation of the 1996 Forest Plan Amendments biological opinion which anticipated the additional incidental take of five MSO PACs in Region 3 due to the rate of implementation of the grazing standards and guidelines, for a total of 156 PACs. To date, consultation on individual actions under the amended Forest Plans have resulted in 204 PACs adversely affected, with 93 of those in the Upper Gila Mountains RU.

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

Elevation within the proposed project area ranges from 6,400 to 7,700 feet. The Sitgreaves National Forest, including the proposed action area, lies on a portion of the Colorado Plateau on and to the north of the Mogollon Rim. From the rim crest, drainages flow north into the Little Colorado River Watershed. The terrain in the area is flat, with a gradient of one to five percent, and is bisected by wide, shallow drainages (USFS 2002). The climate in the area, which occurs along the Mogollon Rim, is dry, with precipitation occurring primarily during summer monsoons and winter snows. This area experienced lower than average amounts of rainfall since 1997, and is considered to be experiencing drought conditions.

Prior to the Rodeo-Chediski fire, a ponderosa pine overstory dominated the vegetative composition on the Sitgreaves National Forest where the fire occurred. Isolated pockets of mixed conifer occur at the higher elevations along the Mogollon Rim and at the upper reaches of drainages along the rim. The ponderosa pine and mixed conifer communities transition to a pinyon-juniper forest generally north of Highway 260 at the northern perimeter of the fire, with ponderosa pine stringers occurring primarily within the drainages flowing to the north. Lower-elevation sites within the fire are pinyon-juniper dominated (USFS 2002).

Surface fuel composition prior to the fire is described as naturally occurring needle cast, small limbs, branch wood, downed logs, and snags in addition to untreated activity fuel residue and annual grasses and forbs. Fuel loadings varied but was rated as light to moderate in most areas (USFS 2002). Fuel moisture percentages prior to the fire were at an unprecedented low due to prevailing drought conditions in the area for the 24 months prior to the fire. Pine densities exceeding 1500 stems per acre with a 100 percent understory crown closure were commonly found throughout the area prior the Rodeo-Chediski wildfire.

A. Status of the species within the action area

There are 20 Mexican spotted owl PACs within the proposed action area: 11 on the Black Mesa Ranger District of the Apache-Sitgreaves National Forest, and nine on the Pleasant Valley Ranger District, Tonto National Forest. These 20 PACs represent 3.2% of the 618 PACs identified in the Upper Gila Mountains RU and 2.0% of the 980 PACs located in the Forest Service's southwest region. In addition, prior to the fire there were approximately 6,000 acres of mixed conifer and oak stands designated as restricted habitat for the Mexican spotted owl.

We consider all of the PACs as occupied pending completion of formal monitoring. All 20 of the PACs in the action area were impacted by the fire to some level due to its intensity and duration. Within the action area, habitat for Mexican spotted owls has been substantially modified by the Rodeo-Chediski fire. Your staff provided the following breakdown of burned areas within the PACs:

| Table 2. Acres and percentages of areas within PACs that were moderately or severely burned, based on 8/24/02 satellite imagery (USFS 2002). | | | | |
|--|-------------------------|-----------------------|---------------------------------|------------------|
| PAC # | Moderately Burned Acres | Severely Burned Acres | Percent Moderate or Severe Burn | Nest Tree Burned |
| 201 | 158.6 | 148.4 | 50.87 | |
| 202 | 168.3 | 240.2 | 67.65 | Yes |
| 203 | 199.9 | 198.5 | 66.09 | Yes |
| 204 | 161.4 | 429.1 | 96.47 | Yes |
| 205 | 214.3 | 155.9 | 61.54 | |
| 206 | 164.4 | 139.6 | 50.71 | Yes |
| 207 | 83 | 143.7 | 37.34 | |
| 208 | 116.5 | 212.8 | 54.24 | Yes |
| 209 | 138.4 | 152.3 | 46.83 | Yes |
| 210 | 39.4 | 146.2 | 31 | Yes |
| 214 | 114.9 | 243.7 | 59.29 | |
| 502 | 243.2 | 98.6 | 56.88 | Yes |
| 503 | 49.1 | 387.1 | 96.36 | Yes |
| 504 | 66.6 | 417.9 | 92.96 | Yes |
| 508 | 114.7 | 19.3 | 20.15 | |
| 509 | 129.3 | 291.8 | 68.9 | Yes |
| 510 | 151 | 303.9 | 82.33 | Yes |
| 511 | 142.7 | 113.7 | 43.76 | |
| 512 | 45.8 | 0 | 6.86 | |
| 513 | 105.2 | 0 | 16.45 | |

Surveys to determine the status of Mexican spotted owl in these areas were completed in 2003, and will be again during the 2004 season. Past occupancy and reproductive history is summarized in Table MSO-1 in Appendix A of the BAE; and is incorporated herein by reference. This table verifies occupancy in five of the PACs in 2002 prior to the fire. Data

provided by your staff indicates that, for many of the PACs within the burned area, either monitoring was informal, or no data were collected for most of 2002. Similar data are shown for most PACs in 1999, 2000, and 2001. However, several of these PACs have had owls for multiple years, and have had successful reproduction. Occupancy has been confirmed for all PACs at some time, and often repetitively, between 1989 and 1997. Young were confirmed for 13 PACs during this time period. Pairs were confirmed for 18 PACs at some time during this time period, and repetitively for many of them. The specific occupancy of individual PACs will be discussed further in the effects of the action below.

Initially, we recommended that surveys not be completed in 2002 following the fire as we did not want to cause additional stress to the owls when we believed that it was too late in the survey season to obtain reasonable results. Surveys were completed during 2003, and are summarized in Table 3 below. Surveys will continue throughout the breeding season in 2004.

Spotted owls are known to exhibit site tenacity, with individual adults occupying the same home ranges for long periods of time, and probably for life. One study found that, of 25 nests of Northern spotted owls that were checked in two or more years, 17 nests (or 68%) were used more than once (Forsmann *et al.* 1984). Biologists on the Coconino and Lincoln National Forests have observed that Mexican spotted owls often return to home ranges and nests following disturbances such as wildfire. Bond *et al.* (2002) determined that, at least in the short-term, Mexican spotted owls are known to return to or remain within their territories following wildfires. For the Rodeo-Chediski fire, this statement is supported by the location of owls associated with 11 of the 20 PACs in the burn area during 2003.

Within the proposed action area, suitable habitat does remain following the fire. As noted in Table 2 above, 90% or higher of PACs 204, 503, and 504 were moderately or severely burned. In addition, 50% or more of the acreage in PACs 201, 206, 208, 214, 502, and 509 was moderately or severely burned. There were approximately 6,000 acres of mixed conifer and oak stands classified as restricted habitat prior to the fire. Your staff reports that burn severity was high on approximately 43,983 acres, moderate on 51,681 acres, and low on 69,218 acres. An additional 12,496 acres were classified as "unburned". Suitable habitat for Mexican spotted owls would remain in those areas considered suitable and that were not moderately or severely burned. According to information provided by your staff, there are 4,306 acres of mixed conifer habitat that qualifies as restricted habitat under the definition within the Recovery Plan. Of that acreage, 789.45 acres are identified as meeting target conditions for restricted mixed conifer habitat, meaning they meet desired conditions to be achieved with time and management. An additional 1.83 acres are defined as threshold conditions, meaning they meet minimal levels of conditions that should be maintained. An additional 15,266 acres consist of pine-oak restricted habitat, with 1,313 acres meeting target conditions.

| Table 3. MSO PAC and occupancy status in 2003. | |
|--|---|
| PAC | Occupancy Status |
| 201 | Male inferred or confirmed |
| 202 | Single Owl - non-nesting confirmed |
| 203 | Single owl - nesting undetermined |
| 204 | Informal Monitoring - No response |
| 205 | Male inferred or confirmed |
| 206 | Informal Monitoring - No response |
| 207 | Informal Monitoring - No response |
| 208 | Male inferred or confirmed |
| 209 | Single Owl inferred or confirmed - 1 young dead |
| 210 | Single owl inferred or confirmed - 3 eggs |
| 214 | Informal Monitoring - No response |
| 502 | Informal Monitoring - No response |
| 503 | Informal Monitoring - No response |
| 504 | Single owl - nesting undetermined |
| 508 | Informal Monitoring - No response |
| 509 | Informal Monitoring - No response |
| 510 | Informal Monitoring - No response |
| 511 | Single owl inferred or confirmed |
| 512 | Single owl inferred or confirmed |
| 513 | Single owl inferred or confirmed |

B. Factors affecting species environment within the action area

Within the proposed action area, there are several State, Tribal, local, and private actions which may have already affected Mexican spotted owls, or that will occur contemporaneously with the proposed action. As previously noted, the Rodeo-Chediski Fire burned approximately 462,384

acres in 2002, resulting in the need for the proposed action. The BAE notes that, of the total fire acreage, approximately 147,500 acres, or 32 percent of the area, was impacted by very intense fire resulting in high burn severity; 99,600 acres, or 22 percent, experienced moderate burn severity, and 215,200 acres, or 46 percent, experienced low burn severity or remained unburned. "High severity" was used to define those areas where no needles remain on the trees, while moderate severity includes those areas having as much as 60 to 100 percent mortality, but with brown needles remaining attached to the tree. Low severity areas are those where the canopy was scorched, but most of the trees were not killed. Unburned areas include those where there was little or no canopy damage, but where surface fire did move through the area (USFS 2002). While the fire was not a management action of any agency or entity, its impacts in the area need to be considered when reviewing the environment within the action area.

Historical fuels management (in the last 15 years) have occurred in this area. The Forest Service has maps on the Internet that detail these areas within the Rodeo-Chediski burn for previous fuels treatments, pre-commercial thinning, commercial timber sales, prescribed fire treatments, and livestock grazing. These figures can be found at http://www.fs.fed.us/r3/asnf/bboard/rc_fire_effects.htm.

During and following the Rodeo-Chediski fire, your staff took management actions related to the fire itself. During the fire, suppression efforts included construction of bulldozer lines for fire breaks, aerial ignition of fires to reduce fuel loading, ignition of fires on the ground to reduce fuel loading, and aerial application of liquid chemical fire-retardant to slow the advance of the wildfire. The Biological Opinion for suppression of the Rodeo-Chediski Fire (file number 02-21-02-F-0224) includes additional detail regarding the actions and their effects on Mexican spotted owls, and is incorporated herein by reference. Table 4 in Appendix C summarizes these actions within PAC boundaries.

Cumulatively, some PACs were impacted by more suppression actions than others. This is particularly true for PACs 503, 504, 508, and 510, which each experienced more than one suppression action.

The Rodeo-Chediski Fire was not the first fire in this area. Previous fires include the Elk Fire, Day Fire, Black Fire, and Bruno Fire. The dates and acreages of these fires are summarized in Table 5.

State actions in the proposed action area are primarily limited to work along State Route 260 through the northern edge of the burn area. Consultations for projects completed by both the State and Federal Highways have included road improvements between Payson and Heber and near Heber-Overgaard, creation of turnouts, improvement of Forest Road 512 (Young Road), installation of guardrails, repair of slide areas, vegetation thinning projects, and shoulder reconstruction and tree removal.

Private inholdings within the burn area are substantial, when including the towns of Forest Lakes, Heber-Overgaard, and Linden in addition to the parcels scattered throughout Forest

| Fire | Date | Acreage Consumed |
|------------|------|------------------|
| Day Fire | 1974 | 3,618 |
| Elk Fire | 1987 | 800 |
| Bruno Fire | 1989 | 328 |
| Black Fire | 1995 | 199 |

Service lands. At Forest Lakes, private lands are still being developed. Additionally, there is a large parcel of approximately 100 acres of private lands at the junction of Forest Roads 86 and 87. This larger parcel is being subdivided into smaller 10-acre parcels, which are being developed for private residences. Currently, there are approximately four new homes under construction in this area. Private land further south on Forest Road 87 was also developed for Legacy Ranch, which is used as a private residence and for a llama farm. In the Heber-Overgaard area, particularly on the border with Forest Service lands, private homes that were lost during the fire are being rebuilt, and additional private properties continue to be developed as permanent residences or as summer residences.

Local actions include those taken by the towns of Forest Lakes, Heber, and Overgaard, but Forest Lakes is the only one of these towns located near Mexican spotted owl PACs or suitable habitat. Work on reducing fuel loads has been completed by the Forest Service in order to protect the towns like Forest Lakes. City limits are adjoining Forest Service land boundaries, and any construction projects for homes, businesses, or infrastructure could have effects to Forest Service lands. However, none of the Mexican spotted owl PACs were within this joint boundary area.

As previously noted, the Rodeo-Chediski Fire began on the White Mountain Apache Tribal lands, and burned approximately 278,183 acres. Additionally, 8,774 acres of private land were burned in the proposed action area. Habitat on the Forest Service lands included within the proposed action are contiguous with habitat on Tribal lands. In fact, some of the owls in PACs designated on Forest Service land likely used lands on Tribal lands outside the action area. Additionally, an unknown number of PACs were burned on Tribal lands, to an unknown degree of severity and extent. The Bureau of Indian Affairs (BIA) has largely completed salvage logging on the Reservation outside of the action area. The BIA has hauled, and will continue to haul, logs salvaged on Tribal lands across Forest Service roads throughout the proposed action area. The BIA hauling action involves the use of Forest Service roads from December 2002 through mid-summer 2003. No new roads were created. The BIA resurfaced some of the existing roads with gravel to accommodate heavier log traffic. The BIA used the following roads: FR 101 to FR 512 on the Tonto National Forest; FR 107 to 260, FR 146 to 260, FR 196 to FR 300, FR 168 to FR 300, FR 162A to FR 300, FR 9559F to FR 300, FR 110 to FR 300, FR 95693, FR 9571D, and FR 95710. The BIA estimated the amount of timber to be hauled across

these roads to be between 60 and 120 million board feet. Biological Opinion 2-23-03-F-07 provides the specific number of truckloads on individual roads and additional project details, and is incorporated herein by reference.

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.

Completed Activities

As previously stated, owls are known to return to or remain within their territories following wildfires, at least for the short-term (Bond *et al.* 2002). This has proven to be the case for PACs 201, 202, 203, 205, 208, 209, 210, 504, 511, 512, and 513 within the proposed action area. Owls in PAC 209, on the Sitgreaves National Forest, are continuing to use an old nest site within a drainage that burned at a low level. The nest tree itself shows some scorching at the base. Both the male and female owls are known to be present within the PAC in 2003, and produced one chick which was subsequently eaten by a predator. Owls in PAC 210 produced eggs, which subsequently failed. Males were inferred or confirmed for PACs 201, 205, and 208, while single owl presence was inferred or confirmed for PACs 202, 203, 504, 511, 512, and 513. Because owls were present before the fire, and were also present during the 2003 survey season in several of the PACs, we believe it is reasonable to conclude that much of the habitat in and around these PACs was occupied at the time of completed BAER work immediately following the fire in 2002.

Aerial Seeding

Aerial seeding operations were conducted at an approximate elevation of 400 feet. Approximately 48,796 acres were seeded in 70 foot-wide swaths per pass. Of the total acreage, approximately 4,153 acres were within Mexican spotted owl PACs (see Table 6 below). Your staff estimate that aerial seeding involved 30 to 40 overflights for nine PACs. Aerial seeding operations can adversely affect Mexican spotted owls because of the direct effects of: 1) noise disturbance due to planes passing at low elevations overhead; and 2) dropping of seed materials.

Studies have been completed on the effects of noise disturbance on owls similar to the noise disturbance caused by the proposed action. It should be noted that the response of wildlife to noise disturbance is complex, being neither uniform nor consistent. Delaney *et al.* (1997)

| Table 6. PACs affected by aerial seeding completed as part of the BAER (PACs not shown did not receive this treatment). | |
|---|---|
| PAC Number | Approximate Acreage of Aerial Seeding in PACs |
| 201 | 139 |
| 202 | 286 |
| 203 | 217 |
| 204 | 592 |
| 205 | 97 |
| 207 | 207 |
| 208 | 310 |
| 209 | 173 |
| 210 | 133 |
| 214 | 293 |
| 502 | 28 |
| 503 | 449 |
| 504 | 482 |
| 508 | 70 |
| 509 | 176 |
| 510 | 399 |
| 511 | 120 |
| 512 | 11 |

reviewed literature on the response of owls and other birds to noise and concluded the following: 1) raptors are more susceptible to disturbance-caused nest abandonment early in the nesting season; 2) birds generally flush in response to disturbance when distances to the source are less than approximately 200 feet and when sound levels are in excess of 95 dBA; and 3) the tendency to flush from a nest declines with experience or habituation to the noise, although the alert response (i.e., head movements or agitated behavior) cannot be completely eliminated by habituation.

Owls have more sensitive hearing than other birds, and noise disturbance can have a variety of adverse effects because they can:

- increase the bird's metabolic rate (the rate at which all chemical reactions occur within a living organism, including the digestion of foods) by making it more active. Increased activity can, in turn, deplete the animal's energy reserves (Bowles 1995).
- cause the bird to expand its home range. Birds usually return to normal use patterns when humans are not present (Bowles 1995), however, energy expended on increased home ranges can decrease the bird's ability to successfully reproduce and raise young.
- displace the bird permanently, if the species is sensitive to the presence of people. If animals are denied access to areas that are essential for reproduction and survival, then that population will decline. Likewise, if animals are disturbed while performing behaviors such as foraging or breeding, that population will also likely decline (Knight and Cole 1995).

We anticipate that these effects could occur for this action, and we believe it is likely that the above information demonstrates that birds may respond to disturbance during the breeding season by:

- abandoning their nests or young;
- altering their behavior such that they are less attentive to the young, which increases the risk of the young being preyed upon;
- disrupting feeding patterns;
- exposing young to adverse environmental stress (Knight and Cole 1995).

It should also be noted that, disturbance during years of diminished prey base, such as those during a drought like the one we are currently in, can result in lost foraging time which, in turn, may cause some raptors to leave an area or to not breed at all (Knight and Cole 1995).

The Recovery Plan notes that the physical structure of canyons can tend to magnify disturbances and limit escape/avoidance routes for owls. Additionally, vegetation which may previously have served as a buffer for overhead flights was lost during the fire, so that noise from overhead flights was likely more disturbing during the aerial seeding operations that occurred following the fire and loss of vegetation.

Generally, we recommend limiting potentially disturbing activities to areas ≥ 0.25 miles from Mexican spotted owl nest sites during the breeding season (March 1 through August 31). This corresponds well with Delaney *et al.*'s (1997) 0.25 threshold for alert responses to helicopter flights.

Your staff indicate that aerially seeding took place over all of the PACs except for 206 and 513. PACs 502, 508, and 511, 512 may have been covered by only one overhead flight, given the acreage covered and the ability of the plane to cover 70 foot wide swaths with each flight (Table

6). Additional aerially seeding occurred adjacent to the boundaries of PACs 201, 202, 203, 204, 205, 207, 208, 209, 210, 214, 504, 508, 511, and 512. As a result, PACs which may have received only one overhead flight (i.e., 508 and 511) were likely disturbed by noise associated with adjacent seeding as well. This noise disturbance was likely minimal compared to that which occurred with repeated flights directly overhead.

Aerial seeding was also applied in restricted habitat. Remaining restricted habitat outside of PACs that was aerially seeded includes a few small pockets around PACs 210, 214, 502, and 508. Effects to restricted but unoccupied habitat (i.e., restricted habitat outside PAC boundaries) are expected to be beneficial in the long-term because they will promote or accelerate growth of new plants, which in turn increases the amount of food and cover available for the small mammals that provide a prey base to the Mexican spotted owl. It is possible for aerial seeding to result in short-term adverse effects due to the breakage of tree branches. However, due to the fact that aerial seeding occurred only in areas that were severely or moderately burned, Mexican spotted owl were likely not present at the time of application, and all tree branches or plants that were damaged were likely already dead.

We believe the effects of aerial seeding were greatest directly over PACs. We believe the adverse effects of the aerially sprayed seeding material are minimal due to the fact that it was applied in areas of severe and moderate burn. Owls are not as likely to be in the areas that were aerially seeded, although they may continue to use them for foraging. We believe that the effects of aerially seeding are due almost entirely to noise disturbance. Overflights took place 56 feet higher than the elevation at which Delaney *et al.* (1997) found owls to flush; however, it is important to note that noise from overflights in this instance would not have been buffered by remaining vegetation in many areas. As a result, noise from the overflights would have traveled farther. Additionally, low-level flights have the greatest potential to disturb owls because they move slowly and are relatively noisy (Delaney *et al.* 1997).

Hand Seeding

Your staff completed no hand seeding to date, so this action will not be analyzed under the emergency consultation phase.

Aerial Application of Straw

The BAE notes that aerial application of straw mulch is largely completed. Your staff indicate that aerial straw application occurred on approximately 748 acres in various Mexican spotted owl PACs. Aerial straw application can adversely affect Mexican spotted owls because of: 1) noise disturbance due to planes passing at low elevations overhead; and 2) dropping of straw, either as light debris, in small clumps, or in portions of large bales. The adverse effects of noise disturbance on Mexican spotted owl is detailed above under aerial seeding.

Straw "bale bombing" involves the dropping of whole straw bales, which then break up in the air or upon impact. Mexican spotted owl can be impacted by the drop of bales through death or injury if nests or roosts receive direct hits. PACs affected by aerial straw application are as follows:

| Table 7. PACs affected by aerial straw application completed as part of the BAER (PACS not shown did not receive this treatment). | |
|---|---------|
| PAC | Acreage |
| 202 | 286 |
| 205 | 189 |
| 206 | 80 |
| 208 | 178 |
| 209 | 25 |
| 210 | 132 |
| 214 | 145 |
| 509 | 26 |

Aerial application of straw also occurred adjacent to PACs 202, 205, 208, 209, 210, and 214, and in restricted habitat. Remaining restricted habitat outside of PACs receiving this treatment include a few small pockets around PACs 209 and 214. Effects to restricted but unoccupied habitat (i.e., restricted habitat outside PAC boundaries) are expected to be beneficial in the long-term because they will reduce erosion and promote or accelerate growth of new plants, which in turn increases the amount of food and cover available for the small mammals that provide a prey base to the Mexican spotted owl. It is possible for aerial straw applications to result in short-term adverse effects due to the breakage of tree branches, however, this breakage would have occurred in areas that were severely or moderately burned.

Ground Mulching

No ground mulching has been completed to date, so this action will not be analyzed under the emergency consultation phase.

Tree Felling

No tree felling has been completed to date, so this action will not be analyzed under the emergency consultation phase.

Channel Clearing

Your staff indicate that 2.2 miles of channels have been cleared along Forest Road 136 near Linden. Channel clearing involves the removal of debris that has built up as a result of the fire. Debris can include downed trees or portions of trees, brush, or other materials. Channel clearing was completed using hand tools and mechanized equipment.

Meadow Protection

Your staff completed no meadow protection actions, so this action will not be analyzed under the emergency consultation phase.

Culvert Removal

Your staff removed approximately 200 culverts and replaced them with rolling grade dips in order to decrease the chance of road damage following blockage of culverts from debris transported during high flow events following the fire. At this time, your staff does not anticipate replacing many of these culverts, but would instead leave the rolling grade dips already in place. Your staff has initiated the removal and disposal of these culverts. Culverts were located throughout the burn area on existing Forest Service roads. Roads that are inside of or in close proximity to PACs include Forest Roads 86, 87, 162, 168, 181, 300, 512. We believe it is possible that owls could have been impacted by noise disturbance during culvert removal on these roads. That disturbance would have been generated by heavy equipment, removal activities, and presence of crews in close proximity to nesting or roosting owls. We anticipate that disturbance of an individual owl or pair of owls would have been a one-time disturbance, and of relatively short duration. However, without specific information on the location of culverts removed, we can not narrow down the scope of the adverse effects for this portion of the action.

Pending Activities

Aerial Seeding

As noted above, additional aerial seeding will occur as funding becomes available. Ultimately, aerially seeding could be applied to another 3,800 acres, with 900 acres of that occurring in portions of PACs 201, 202, 204, 205, 207, 208, 209, 210, 214, 502, 504, 508, 509, and 510. Of those PACs, 201, 202, 205, 208, 209, and 504 are currently occupied by owls according to surveys completed by your staff in 2003. In addition, aerial seeding will be applied to restricted habitat. The majority of PAC 504 would be seeded, and owls are currently occupying that PAC. Approximately half of each of PACs 208, and 209, and small portions of PACs 201, 202, and

205 also occupied by owls, would also be seeded. Seeding would take place in the fall, outside of the breeding season, and would occur at 400 feet above ground level.

The effects of aerial seeding are described in detail above under activities completed. In summary, our concerns for occupied or potentially occupied areas include noise disturbance and accompanying changes to metabolic rates, home ranges, displacement, behavior alteration, disrupted feeding patterns, and increased exposure to environmental stresses.

Hand Seeding

Hand seeding will use native seeds, and will occur when funding becomes available. Hand seeding will occur only in areas of moderate and high burn severity where crews can work safely. Seed would be applied by 20 person crews at a production rate of approximately 160 acres per day. A breakdown of hand seeding acres by PAC is provided in Appendix B of the BAE, and is incorporated herein by reference. Acreage to be treated with hand-seeding in PACs, as calculated by GIS, is as follows:

| PAC | Acreage Seeded |
|-----|----------------|
| 201 | 175 |
| 205 | 180 |
| 206 | 120 |
| 207 | 47 |
| 208 | 155 |
| 209 | 167 |
| 214 | 40 |
| 502 | 274 |
| 508 | 109 |
| 511 | 195 |
| 512 | 10 |
| 513 | 53 |

Of these PACs, PACs 201, 205, 208, 209, 511, 512, and 513 were occupied by owls in 2003. The effects of hand seeding in occupied PACs, ultimately, are beneficial. Hand seeding will encourage and speed up plant regrowth. Increased numbers of plants will, in turn, protect soil from erosion by wind and water. In the short-term, hand seeding in PACs will involve crews of up to 20 individuals working within PAC boundaries. The work itself will not involve the use of mechanized equipment. Human presence and noise disturbance associated with hand tools are

therefore the only disturbances anticipated with this portion of the proposed action. Swarthout and Steidl (2001) found that 95 percent of adult and juvenile owls became alert to approaching hikers at 180 feet (55 meters). Ninety-five percent of all adults flushed in response to approaches by a single hiker at 30 feet (9 meters) or less, while 95 percent of all juveniles flushed at 20 feet (6 meters) or less. Owls that had flushed previously were more likely to flush on subsequent approaches by humans. They note that the direct costs associated with responding to disturbance include energetic demands of avoidance flight and time lost that would be allocated to other activities (such as foraging, resting, etc.). Additionally, energetic demands of avoidance flights increase heat production and can lead to use of alternative roosts in warmer areas. Owls that flush in response to disturbances also increase their exposure to predators (Swarthout and Steidl 2001).

The information presented by Swarthout and Steidl (2001) indicates that owls are disturbed by approaching humans, and that they become more sensitive with repetitive approaches. With crews of up to 20 individuals working within PAC boundaries, it is therefore reasonable to conclude that the proposed action will cause short-term adverse effects to Mexican spotted owls.

Aerial Application of Straw

Additional aerial application of straw is anticipated, but the exact locations of the application is not known at this time, as it will depend on which areas are showing increased erosion, or increased potential for erosion, over time. Your staff anticipate covering approximately 1,000 additional acres with aerial straw application (B. Dykstra, pers. comm. 2003, Apache-Sitgreaves National Forests). Although this is a necessary tool for reducing erosion and accelerating the growth of new vegetation, the actual application may result in adverse effects to MSOs.

Ground Mulching

Your staff anticipate completing ground mulching immediately adjacent to Forest Highway 260. There are no known PACs in this area (B. Dykstra, pers. comm. 2003, Apache-Sitgreaves National Forests), and therefore no adverse effects to the species is anticipated.

Tree Felling

Your staff anticipate completing 1,100 acres of tree felling, with 700 acres on the Tonto National Forest, and 400 acres on the Apache-Sitgreaves National Forest. Any additional tree felling beyond this acreage would require additional consultation. Trees would be felled using chainsaws, and would take place in between 14 to 20 of the PACs affected by the fire. The BAE notes that the activity may occur during the breeding season, but would be planned so that areas farthest from low or unburned habitat patches would be treated during the breeding season. The BAE notes that no trees will be felled within 400 feet of intact nesting areas. For those PACs in which nesting owls are located, all tree felling work would be discontinued until after the breeding season. For 2003, this would include PACs 203, 209, 210, and 504. The PACs which meet this criteria could change following surveys in 2004. Disturbance to other owls is

reasonably certain to occur in PACs known to be occupied in 2003, including PACs 201, 205, 208, 209, 210, and 511. Tree felling activities occurring within PACs is as follows (acreage generated by GIS):

| PAC Number | Acreage Affected |
|------------|------------------|
| 201 | 126 |
| 205 | 103 |
| 206 | 65 |
| 207 | 106 |
| 208 | 92 |
| 209 | 68 |
| 210 | 108 |
| 214 | 105 |
| 502 | 92 |
| 508 | 44 |
| 509 | 276 |
| 511 | 68 |

Delaney *et al.* (1997) noted that owls may exhibit alert responses to chainsaws at 400 feet, but that flushing occurred at approximately 200 feet. It should be noted that Delaney *et al.* (1997) conducted their testing by hiding the chainsaw operator behind vegetation, and that no trees were actually cut. This varies from the proposed action, in that owls would likely be exposed to human presence of the chainsaw operators, greater than one person would likely be present, and trees would actually be cut down, which would increase the level of the noise and overall disturbance.

Because the proposed action would allow for tree-felling during the breeding season within PAC boundaries, and because Delaney *et al.* (1997) have noted that owls exhibit both alert and flushing responses to chainsaw noise, we believe that this portion of the proposed action will adversely affect Mexican spotted owls. In the PACs identified in Table 9 above. The detrimental effects of flushing are described above under overhead flights for aerial seed and straw application.

Channel Clearing

Your staff anticipates clearing up to an additional 6.8 miles of channel, as dictated by on-the-ground conditions. The original 2.2 miles which have already been cleared may need to be cleared again. At this time, your staff are not able to define exactly where channel clearing may be needed, as it will be dictated by on-the-ground conditions over time. PACs 201, 202, 203, 205, 206, 208, 209, 210, 503, 504, 508, 509, 510, 11, 512, and 513 all have some type of watercourses in them, per geographic information provided by ALRIS (2002). Mule Creek, Canyon Creek, and Black Canyon represent three of the more substantial drainages in the proposed action area. Canyon Creek runs through PACs 510, 512, and 513, while Mule Creek runs through PAC 504. Black Canyon runs through PACs 209 and 214.

Channel clearing involves removal of debris that built up following the fire (e.g., downed logs or branches). Removal may be completed by hand or with mechanized equipment. These actions would generally be short-term in nature.

Meadow Protection

Meadow protection would involve the installation of fencing at Gentry and Baca meadows. The purpose of the fencing is to keep elk out of areas that were burned, in order to facilitate regeneration of plants so that erosion is minimized. As a result, your staff anticipate that there would be increased water flows and habitat for voles and other small mammals important to spotted owls. The two meadows to be fenced include only ponderosa pine (B. Dykstra, pers. comm. 2003, Apache-Sitgreaves National Forest). The meadows are located adjacent to PACs 209 and 214. Because of this, it is anticipated that they would be used only for foraging, and not for nesting or roosting, by spotted owls.

We do not know the foraging patterns or behaviors of the pair of owls in PAC 209, or if PAC 214 is currently occupied. Preliminary data from 2003 surveys was informal, and did not locate owls in PAC 214. Additional survey work would be needed to conclude that the PAC is unoccupied. The Recovery Plan notes that 600 acres encompasses approximately 75% of the area generally used by an owl for foraging. Therefore, owls spend approximately 25% of their foraging time outside of PAC boundaries. The area immediately surrounding PAC 209 consists of low and unburned areas to the north and east, and to the south. The severity of the burn in other areas will likely funnel Mexican spotted owls into the remaining low or unburned forested areas. Baca Meadow is one of these low or unburned areas, and is located approximately 0.25 to 0.50 miles to the south of the PAC. Because fence construction would occur during daylight, and owls forage primarily at night, we believe the impacts of this portion of the action will not significantly affect the species.

Culvert Removal

No additional culverts are scheduled for removal at this time.

COMBINED EFFECTS

It is important to consider the combined effects of the fire, its suppression, and rehabilitation efforts on Mexican spotted owls. Table 10 in Appendix C compiles this information. Essentially, the majority of the spotted owls in PACS 201, 202, 205, 206, 207, 208, 209, 210, 214, 502, 508, 509, 511, and 512 were or would be disturbed by a combination of multiple rehabilitation efforts. While we believe the rehabilitation efforts are in the best long-term interests of the species, we also believe that there were likely short-term adverse effects. These effects were compounded by the fire and suppression efforts, as well as by the fact that more than one entry or disturbance event would occur within these PACs for rehabilitation purposes.

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.

We are not aware of any specific future State or Tribal actions. We anticipate that future local and private actions include rebuilding of structures damaged or lost during the Rodeo-Chediski fire in the communities of Forest Lakes, Pinedale, Linden, and Heber-Overgaard. Additionally, private landowners may take various steps to reduce fuel loads and fire hazards surrounding their properties, which could include vegetation removal.

CONCLUSION

After reviewing the current status of Mexican spotted owls, the environmental baseline for the action area, the effects of the emergency rehabilitation efforts (both completed and pending), and the cumulative effects, it is our biological opinion that the BAER emergency actions as completed did not likely jeopardize the continued existence of the Mexican spotted owl. Similarly, it is the FWS's opinion that the proposed on-going BAER actions are not likely to jeopardize the continued existence of the Mexican spotted owl. No critical habitat has been designated for this species, therefore, none will be affected.

We present these conclusions for the following reasons:

- 1) The effects of the fire form, in part, the environmental baseline against which the management action occurred. Because of fuel loading and drought conditions in this area, the fire did not behave like or result in conditions similar to a natural fire, and the resulting effects on the Mexican spotted owl are therefore likely variable. In some areas, owls may have been killed, and in other areas they may have left, either temporarily or permanently. Owls are known to return to their PACs following fires (Bond *et al.* 2002) as they did in some cases after this fire.

- 2) In the long-term the rehabilitation efforts will likely benefit Mexican spotted owl through rehabilitation of habitat that will lead to an enhanced prey base for the species.
- 3) These 20 PACs represent 3.2% of the 618 PACs identified in the Upper Gila Mountains RU and 2.0% of the 980 PACs located in the southwest region. This is a relatively small percentage of the total number of remaining PACs.

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

The measures described below are non-discretionary, and must be undertaken by the Forest Service so that they become binding conditions of any grant or permit issued to contractors, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest Service (1) fails to assume and implement the terms and conditions or (2) fails to require the contractor to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest Service or contractors 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

Take From Completed Action

The actions already completed under the BAER were part of an emergency consultation. The actions were deemed an emergency because the rehabilitative measures taken were designed to prevent further harm to human life and property. Take did occur in the process of carrying out

the emergency measures; however, the FWS believes that this take was unavoidable given the emergency at the time. We anticipate that take of Mexican spotted owls occurred as detailed below by actions already completed. It is important to note that the FWS believes the Forest Service completed actions which, although they resulted in take, were necessary following the wildfire, and which may facilitate recovery of the burned areas for Mexican spotted owls and other species. We anticipate take occurred as follows:

Eighteen PACs including 201, 202, 203, 204, 205, 206, 208, 209, 210, 214, 502, 503, 504, 508, 509, 510, 511, 512 in the form of direct mortality, harm, or harassment. These are PACs which were known to support owls in the last five years and which were treated in some way under the BAER project. PACs 201, 202, 203, 205, 208, 209, 210, 504, 511, and 512 were occupied in 2003 following the fire.

We believe this level of take was reasonably certain to have occurred because: 1) there is a substantial survey record documenting repeated occupancy and breeding within these PACs; 2) Mexican spotted owls are known to return to activity centers following disturbances like fires; 3) published research has indicated that overhead flights are disturbing to raptors, and to Mexican spotted owls specifically; 4) overhead flights for aerial seeding or aerial application of straw or both occurred within these PACs, which were known to be occupied following the fire; and 5) vegetation which would previously have buffered the noise associated with low overhead flights was removed during the wildfire, resulting in noise disturbance carrying for a longer distance.

Take From Actions to Be Completed

For actions yet to be completed, the FWS also believes take of Mexican spotted owls will result from the action proposed by the Forest Service.

Eighteen PACs, including PACs 201, 202, 204, 205, 206, 207, 208, 209, 210, 214, 502, 504, 508, 509, 510, 511, 512, and 513 for aerial seeding, hand seeding, and tree felling activities that will occur over and in the PACs. FWS anticipates take in the form of direct mortality, harm, or harassment of each of these PACs.

We believe this level of take is reasonably certain to occur because: 1) there is a substantial survey record documenting repeated occupancy and breeding within these PACs; 2) Mexican spotted owls are known to return to activity centers following disturbances like fires; 3) published research has indicated that overhead flights are disturbing to raptors, and to Mexican spotted owls specifically; 4) overhead flights for aerial seeding or aerial application of straw or both occurred within these PACs, which were known to be occupied following the fire; and 5) vegetation which would previously have buffered the noise associated with low overhead flights was removed during the wildfire, resulting in the carry of noise disturbance for a longer distance.

We anticipate that take of Mexican spotted owls relative to channel clearing will be minimal, while that associated with aerial straw application will be similar to that applied to aerial seeding.

However, we are unable to conclude where that take is reasonably certain to occur for these two activities due to inadequate detail as to the location of these actions relative to Mexican spotted owls. We have described the anticipated effects of these actions in the Effects of the Action section above. When your staff have determined at which locations these actions will be taken, if necessary, we will append this biological opinion with a more site-specific take statement, reasonable and prudent measures, and terms and conditions, as needed. This should be completed prior to implementing this portion of the action.

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

EFFECT OF THE TAKE

In this biological opinion, we determined that this level of anticipated take from both the pending and completed actions is not likely to result in jeopardy to the Mexican spotted owl.

REASONABLE AND PRUDENT MEASURES

Incidental take statements in emergency consultations do not include reasonable and prudent measures or terms and conditions to minimize take unless the agency has an on-going action related to the emergency (USFWS 1998a). Therefore, we have not developed any reasonable and prudent measures for completed actions. All of the reasonable and prudent measures below apply only to pending actions. In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service must comply with the following terms and conditions. These terms and conditions are non-discretionary. Reasonable and prudent measures and terms and conditions assume complete adherence to the conservation measures identified as part of the proposed action above.

The following reasonable and prudent measures and terms and conditions are necessary and appropriate to minimize take of Mexican spotted owls:

1. Minimize disturbance from low-flying aircraft used in aerial seeding.
 - a. Participate in flight planning to minimize the number of trips over PACs to the extent possible.
 - b. Route flights to and from the proposed action area as far from PAC boundaries as is logistically feasible.
 - c. Brief pilots on the importance of flight paths, and on the location of areas to be avoided during flight.

2. Minimize disturbance associated with tree felling in and adjacent to PACs.

- a. Create a buffer from which chainsaw felling of trees will be excluded during the breeding season.

This buffer area will include:

- High and moderately burned areas within 0.25 miles of known Mexican spotted owl foraging, roosting, or nesting areas in the eight PACs that are occupied as of 2003 (PACs 201, 205, 206, 207, 208, 209, 210, 214, 502, 508, 509, 511) and that would be affected by tree felling;
- High and moderately burned areas within or immediately adjacent to the boundaries of PACs 201, 205, 206, 207, 208, 209, 210, 214, 502, 504, 508, 506, and 511, unless it is known that owls are not using these areas for foraging, roosting, or nesting. This term and condition will ensure that owls are not impacted in areas immediately adjacent to PACs that may have become crucial parts of their territories following the loss of large percentages of the original PAC during the fire.

3. Minimize disturbance associated with hand seeding activities in PACs.

- a. Exclude hand seeding during the 2004 breeding season within 0.25 miles of any areas known to be used for foraging, roosting, or nesting by Mexican spotted owls as determined by 2003 surveys.

4. Assess the effects of the proposed action on Mexican spotted owl, and report the findings to this office.

- a. The Forest Service shall monitor the project area and other areas that could be affected by the proposed action to ascertain take of individuals of the species and/or loss of its habitat that causes harm or harassment to the species. Findings shall be reported, per item c below.
- b. Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, Federal Building, 2450 West Broadway #113, Mesa, Arizona (telephone: 480/835-8289) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph 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.

- c. The Forest Service shall submit annual monitoring reports to the Arizona Ecological Services Field Office by December 31 beginning with the year in which the action is first implemented. These reports shall briefly document for the previous calendar year the effectiveness of the terms and conditions and locations of listed species observed, and, if any are found dead, suspected cause of mortality. The report shall also summarize tasks accomplished under the proposed minimization measures and terms and conditions.

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.

1. Consider completion of an assessment of restricted habitat for Mexican spotted owls. Little was known about restricted habitat at the district-wide level prior to the fire, and less is known now.
2. We recommend an analysis of habitat be completed to determine how PAC boundaries can be modified post-fire to protect the best suitable habitat for Mexican spotted owls.
3. Evaluate the effectiveness of the rehabilitation measures to determine if they accomplish the goals of the BAER program.
4. Develop a native seed base to be used in future BAER activities.

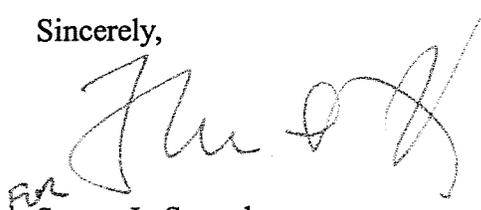
In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the consultation 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.

We appreciate the Forest Service's efforts to identify and minimize effects to listed species from this project. For further information please contact Mary Richardson (x242) or Debra Bills (x239). Please refer to the consultation number, 02-21-02-F-0225, in future correspondence concerning this project.

Sincerely,

A handwritten signature in black ink, appearing to read "Steven L. Spangle". The signature is written in a cursive style with a large initial "S".

Steven L. Spangle
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
State Supervisor, New Mexico Ecological Services Office
Superintendent, Bureau of Indian Affairs, Whiteriver, AZ
Sensitive Species Coordinator, White Mountain Apache Tribe, Whiteriver, AZ
Forest Supervisor, Tonto National Forest, Phoenix, AZ
District Ranger, Black Mesa Ranger District, Overgaard, AZ
District Ranger, Payson Ranger District, Payson, AZ

John Kennedy, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

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APPENDIX A - CONCURRENCES

Bald Eagle

As noted within the BAE, mid-winter surveys for bald eagles have been conducted from January 1992 through January 2002. Breeding bald eagles live year-round in Arizona, while wintering bald eagles arrive in November, with numbers peaking in January and February (Todd 1978), and with birds migrating north in April. Only wintering bald eagles are known to occur within the proposed action area. Wintering birds are typically centered around major river drainages or lakes. Birds are widely scattered and normally seen as solitary individuals or in small groups (Grubb and Kennedy 1982). Within the proposed action area, eagles winter in low densities around lakes above the Mogollon Rim and near the Canyon Creek Fish Hatchery. Birds sighted in other areas are usually feeding on carrion. Year-round habitat exists for bald eagles within and adjacent to the burn area.

Actions completed as part of the emergency work associated with the BAER were completed in July - September, prior to arrival of wintering bald eagles. There were, therefore, no direct effects of the completed work on bald eagles. With respect to indirect effects through habitat modification, it should be noted that the burned area encompasses more than 642,000 acres, which burned in a mosaic pattern. Within that burned area, suitable habitat for bald eagles remains. Known concentration areas of bald eagles include O.W. Ranch, the Canyon Creek Fish Hatchery, and Black Canyon Lake. Up to seven bald eagles may use a given concentration area at one time (H. Provencio, USES, pers. comm. 2003). The Forest Service completed minimal work around O.W. Ranch, including fence construction and removal. At Canyon Creek Fish Hatchery, the Forest Service completed some aerial seeding. At Black Canyon Lake, the Forest Service completed aerial seeding, aerial straw application, and some hand seeding. The BAE notes that some hazard tree removal also occurred.

The effects of fence removal and construction at O.W. Ranch were minimal. As noted in the BAE, seeding and mulching treatments will improve herbaceous ground cover, and will help reduce the amount of time required for other animals to repopulate the burned area. They will additionally aid in a reduction of soil erosion. Similarly, fencing construction will prevent continued use of areas by grazing ungulates, thereby allowing for soil retention and reducing erosion. Hazard tree removal did result in the removal of some large trees which might have been used at some time by bald eagles. However, tree removal was limited to those trees posing a risk to the lives of forest workers and visitors. There are many remaining trees throughout the burned areas, including at concentration areas, which can be used by bald eagle. Therefore, the overall effects to bald eagle habitat from tree removal are insignificant.

We anticipate that activities completed under the BAER may beneficially affect bald eagles in reducing erosion and encouraging vegetation regrowth. The FWS also believes that the effects of tree removal are minimal due to the low number of trees removed. Finally, all of the work was completed outside of the time period during which bald eagles are present, so that no direct effects of the action adversely affected bald eagles. For this reason, we concur the action, as completed, may have affected, but did not adversely affect, bald eagles.

Little Colorado Spinedace

As noted in the BAE, the nearest known Little Colorado spinedace habitat is in Chevelon Creek. Surveys conducted in 1996 on those portions of Chevelon Creek within the Apache-Sitgreaves boundary found no fish. Previous surveys for spinedace located them on Chevelon Creek near its confluence with the Little Colorado River, approximately 40 miles away. Spinedace have never been recorded within the proposed action area boundaries, therefore, any effects would have to be indirect effects to habitat.

With respect to habitat, eight miles of Chevelon Creek, from its confluence with the Little Colorado River upstream to its confluence with Bell Cow Canyon are designated as critical habitat for Little Colorado spinedace (USFWS 1998b). The entire length of Chevelon Creek is considered to be potential habitat for spinedace, and has been identified as a refuge in the Little Colorado spinedace Recovery Plan (USFWS 1998b).

The northwestern edge of the Rodeo-Chediski fire is approximately 60 miles from the nearest known population of spinedace. Black Canyon is the main collector drainage in this area, and it flows into Chevelon Creek approximately 15 miles north of the Apache-Sitgreaves National Forest boundary. This drainage is classified as intermittent, typically flowing only during spring runoff and monsoon season with small pools in the upper portion of the drainage at Milford Spring that holds water year round. No permanent pools are known to exist north of Milford Spring. The nearest known population of spinedace to the fire is near the headwaters of the Little Colorado River in the White Mountains. This area is upstream of where drainages burned during the fire meet the Little Colorado River, and will not be affected by either the fire or rehabilitation treatments.

As a result of the fire, tens of thousands of burned acres will likely result in increased water flows and turbidity levels. BAER treatments can not be applied to all of this acreage; however, where they are applied, they have been designed to reduce sediment runoff from the burned area. None of the completed work was carried out in occupied spinedace areas. Any indirect effects should therefore be beneficial, in that they will assist in a reduction of excessive flows and increased sedimentation to areas occupied by spinedace outside of the project area. The FWS therefore concurs that the proposed action may affect, but is not likely to adversely affect, Little Colorado spinedace.

Chiricahua Leopard Frog

Historically, Chiricahua leopard frogs were documented in the Little Colorado River system on the Springville and lakeside Ranger Districts, and in the headwaters of the San Francisco river on the Alpine Ranger District. They are believed to have occurred in the Eagle Creek system on the Clifton Ranger District as well (Wright and Wright 1949, Platz and Platz 1973, Platz and Mecham 1979, Frost and Platz 1983). The Arizona Game and Fish Department conducted amphibian surveys in 1992 on the Black Mesa Ranger District, but did not find any Chiricahua

leopard frogs (Ingraldi 1995). Chiricahua leopard frogs have not been documented within the Canyon Creek Watershed. A portion of Canyon Creek was surveyed in the early 1990s, with no Chiricahua leopard frogs detected (Sredl and Howland 1992). However, thorough surveys specific to Chiricahua leopard frogs have not been completed for all potential or suitable habitat throughout the proposed project area.

As noted in the BAE, the Gentry Creek Conservation and Management Zone (C.Z.) for Chiricahua leopard frogs was established in the northern portions of the Pleasant Valley Ranger District. Chiricahua leopard frogs have been documented repeatedly in this area since 1990. The nearest locations of frogs to the proposed project area is 1.0 miles to the southwest of the fire perimeter, and 1.5 miles to the west of the fire perimeter.

Chiricahua leopard frogs are a highly aquatic species, and are considered habitat generalists within aquatic habitats. They are found in drainages, pools, beaver ponds, livestock tanks, lakes, reservoirs, streams, and rivers. Blomquist *et al.* (2002) note that most sites that support populations of Chiricahua leopard frogs hold water year long in most years. They note that Chiricahua leopard frogs are rarely found in aquatic sites inhabited by nonnative fish, bullfrogs, or crayfish.

According to the BAE, there are two lotic riparian systems within the proposed action area at Canyon Creek and at Mule Creek. Both of these are perennial streams on the Tonto National Forest that have the potential to support populations of Chiricahua leopard frogs, however, the species has not been documented in these drainages. Sredl and Howland (1992) conducted surveys in a portion of Canyon Creek, but found no frogs. Canyon Creek has been managed as a trout fishery for several decades, and the presence of non-native fish there may have prevented the establishment of a leopard frog population. Numerous stock tanks that are potential habitat for this species also exist within the burn area on both the Tonto and Sitgreaves National Forests. Sredl *et al.* (1994) and Apache-Sitgreaves National Forests personnel have conducted surveys for northern leopard frogs, with no evidence of Chiricahua leopard frogs reported. However, no surveys specific to Chiricahua leopard frog have been completed.

As part of the proposed action, the Forest Service breached eight dry stock tanks that were likely to breach naturally and cause downstream flooding. During wet periods, these may have constituted potential Chiricahua leopard frog habitat, but they have been dry during the past several years of drought. As noted in the BAE, hundreds of tanks remain available within the proposed action area as potential habitat for Chiricahua leopard frog.

Aerial seeding and application of straw will, in the long-term, be beneficial to frogs in that they will help reduce the amount of sediment entering some of the remaining stock tanks, and will result in a better herbaceous cover around tanks than would have occurred without seeding. Channel clearing was completed along 2.2 miles of channel. This work involves removal of woody debris that has fallen into side drainages and larger washes. The woody material is removed by dozers and by hand crews with skidders to prevent accumulation into debris flows

that could potentially threaten life and property in downstream areas. Where dozers and skidders are used, they are not used within the drainages themselves. Debris is instead dragged from the channels using long cables and chokers attached to the equipment. The drainages cleared above the Mogollon Rim are not likely to have provided habitat for the frog because they are dry most of the year and carry water only during high flow events.

Because channel clearing occurred in channels that are intermittent, and therefore not suitable frog habitat, and because the stock tanks breached had been dry for several years, the FWS does not anticipate that tank breaching or channel clearing adversely affected Chiricahua leopard frog. Aerial application of seed and straw will, in the long-term, be beneficial to the frog due to the resulting reduction in sedimentation and increase in vegetation.

APPENDIX B - FIGURES

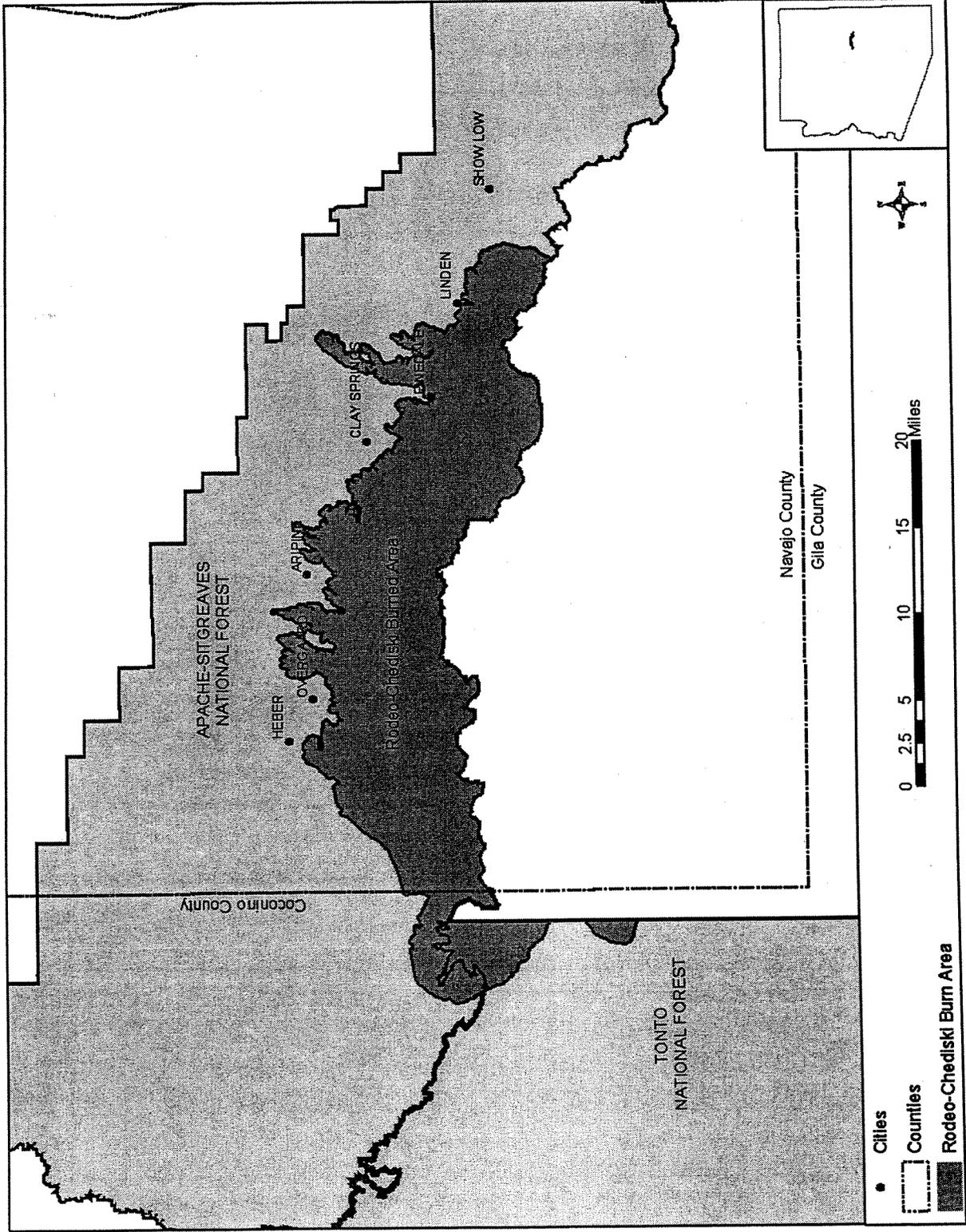


Figure 1. Proposed Action Area.

APPENDIX C - TABLES

Table 4. Actions completed as part of the Rodeo-Chediski fire suppression in June and July, 2003, within the proposed action area.

| PAC | Bulldozer Line | Aerial Ignition | Aerial Retardant | Burnout Oper. |
|-----|------------------------------|-----------------|------------------|---------------|
| | ≈Length | ≈Amount | ≈Amount | ≈Amount |
| 201 | | | | X |
| | | | | 1/3 of PAC |
| 208 | | | | X |
| | | | | ½ of PAC |
| 210 | | | | X |
| | | | | 1/4 of PAC |
| 502 | X | | | |
| | Adjacent to PAC for 1.0 mile | | | |
| 503 | | | X | X |
| | | | Small fraction | 3/4 of PAC |
| 504 | | X | X | X |
| | | 1/4 of PAC | 1/8 of PAC | ½ of PAC |
| 508 | X | | | X |
| | 0.09 miles | | | 3/4 of PAC |
| 509 | | | | X |
| | | | | 100% of PAC |
| 510 | | X | X | X |
| | | 1/3 of PAC | 7/8 of PAC | 100% of PAC |
| 511 | X | | | X |
| | 1.9 miles | | | 3/4 of PAC |
| 512 | | | | X |
| | | | | 1/3 of PAC |
| 513 | | | | X |
| | | | | 3/4 of PAC |

| Table 10. Compilation of effects within PACs treated by suppression and rehabilitation actions. | | | | | |
|---|---------------------|-------------------------|-----------------------|-----------------------|-----------------------|
| PAC Number | Suppression Yes/No* | Acres of Aerial Seeding | Acres of Aerial Straw | Acres of Hand Seeding | Acres of Tree Felling |
| 201 | Yes | 139 | 0 | 175 | 126 |
| 202 | No | 286 | 286 | 0 | 0 |
| 203 | No | 217 | 0 | 0 | 0 |
| 204 | No | 592 | 0 | 0 | 0 |
| 205 | No | 97 | 189 | 180 | 103 |
| 206 | No | 0 | 80 | 120 | 65 |
| 207 | No | 207 | 0 | 47 | 106 |
| 208 | Yes | 310 | 178 | 155 | 92 |
| 209 | No | 173 | 25 | 167 | 68 |
| 210 | Yes | 133 | 132 | 0 | 108 |
| 214 | No | 293 | 145 | 40 | 105 |
| 502 | Yes | 28 | 0 | 274 | 92 |
| 503 | Yes | 449 | 0 | 0 | 0 |
| 504 | Yes | 482 | 0 | 0 | 0 |
| 508 | Yes | 70 | 0 | 109 | 44 |
| 509 | Yes | 176 | 26 | 0 | 276 |
| 510 | Yes | 399 | 0 | 0 | 0 |
| 511 | Yes | 120 | 0 | 195 | 68 |
| 512 | Yes | 11 | 0 | 10 | 0 |
| 513 | Yes | 0 | 0 | 53 | 0 |
| TOTALS | //// | 4182 | 1061 | 1525 | 1253 |

*See Table 4 for a discussion of suppression activities within each PAC.

