

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
22410-2007-FE-0338

July 22, 2009

Mr. Chris Knopp
Forest Supervisor
Apache-Sitgreaves National Forests
P.O. Box 640
Springerville, Arizona 85938-0640

Dear Mr. Knopp:

Thank you for your request for formal emergency 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 emergency consultation was dated November 20, 2007, and received by us on November 23, 2007. Your completion of the Emergency-Fire Documentation form and the January 29, 2008, addendum fulfills the requirements necessary to initiate emergency consultation typically provided in a biological assessment and evaluation (BAE). At issue are impacts that were associated with fire suppression and emergency stabilization activities for the Chitty Wildfire, located on the Clifton and Alpine Ranger Districts, Apache-Sitgreaves National Forest (ASNF), in Greenlee County, Arizona. Your Emergency-Fire Documentation concluded that the suppression and emergency stabilization activities likely adversely affected the Mexican spotted owl (*Strix occidentalis lucida*; MSO) with designated critical habitat and suppression and emergency stabilization temporarily adversely affected the Gila chub (*Gila intermedia*) with critical habitat. You also concluded that suppression and emergency stabilization actions were not likely to adversely affect the Chiricahua leopard frog (*Lithobates [Rana] chiricahuensis*), Gila trout (*Oncorhynchus gilae*), and were not likely to jeopardize the continued existence of the Mexican gray wolf (*Canis lupis baileyi*). We concur with your determination for the Chiricahua leopard frog and Mexican gray wolf and provide our reasoning in Appendix A. On March 18, 2008, we received your request to remove Gila trout from consideration in the emergency consultation because the species is not known to occur within the action area. We concurred with your assessment and removed Gila trout from consideration.

This biological opinion is based on information provided in the Emergency-Fire Documentation form, January 29, 2008 BAE addendum, telephone conversations and emails between my staff and your staff, and information provided in associated maps. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at our office.

Consultation History

- July 2, 2007: We received a telephone call from the Forest initiating emergency consultation.
- November 23, 2007: We received a November 20, 2007, letter from the Forest requesting initiation of formal section 7 consultation and a final Emergency-Fire Documentation form.
- January 14, 2007: We received a January 11, 2007, BAE addendum from the Forest through email.
- January 29, 2007: We received a January 29, 2007 final BAE addendum from the Forest through email.
- March 18, 2008: We received a request by the Forest to remove Gila trout from consideration in the emergency consultation.
- March 25, 2008: We acknowledged the Forest's November 20, 2007, request for formal consultation by letter.
- July 31, 2008: We submitted a draft BO to the Forest and requested a 60-day extension to complete the consultation by letter.
- April 1, 2009: Project closed until the Forest responds to the draft document.
- June 17, 2009: We received comments from the Forest on the draft BO.

BIOLOGICAL OPINION

BACKGROUND

The Chitty Wildfire was started on June 30, 2007 from a lightning strike east of Chitty Creek, along the Clifton and Alpine Ranger District boundary, on the Mogollon Rim. The wildfire consumed a total of 2,174 acres, of which, 896 acres within the upper reaches of Chitty, Crabtree, and East Eagle Watersheds were burned by a crown and high intensity fire (Appendix C, Table 1). A wildfire perimeter was established along Forest Service Road 54 on top of the Mogollon Rim, Highway 191, and interior Forest Service trail systems. Wildfire behavior was described as torching, short crown runs, and upslope runs which resulted in a large number of spot fires occurring in the surrounding drainages of Chitty Creek. The weather service reported winds from the southeast at 5 to 10 mph, gusting up to 20 mph. The terrain consists primarily of steep slopes and narrow canyons with elevations ranging from 5,000 feet to 8,500 feet and is within the Petran Montane Conifer Forest biotic community (Brown 1994). Prior to the Chitty Wildfire, Chitty Creek area was classified as Fire Regime Current Condition Class (FRCCC) of 3, which is defined as having a high departure from the natural (historical) regime of vegetation characteristics; fuel compositional fire frequency, severity and pattern; and other association disturbances (Schmidt et al. 2002). Thus the ASNF was actively conducting thinning and

prescribe fire treatments in the Chitty Creek area to reduce the fuel load and threat of a catastrophic wildfire (22410-2004-F-0006, 22410-2004-F-0006R1).

DESCRIPTION OF THE EMERGENCY ACTION

Emergency suppression activities were initiated on June 30, 2007 and terminated on July 16, 2007. Suppression is defined as all the work of extinguishing or confining a fire beginning with its discovery (National Wildfire Coordination Group [NWCG] 1996). Wildfire suppression tactics included ground ignition, ground suppression, aerial ignition, and aerial suppression. Ground ignition includes all ignition tools and methods used by hand crews to control a wildfire, such as clearing vegetation and intentionally igniting a controlled fire to create burn-out zones in order to eliminate fuel loading. Ground suppression includes all suppression tools and methods used by hand crews to create fire breaks (e.g. using a bulldozer to remove fuel; NWCG 1996). Aerial ignition includes intentional ignition of fuels by dropping incendiary devices or materials from aircraft. Aerial suppression includes applications of fire-retardant and water to aggressively suppress a wildfire. Additional details of the suppression actions are listed below.

Ground suppression/ ignition/stabilization

Ground suppression activities included a 1.1 mile by 20 foot wide bulldozer control line adjacent to Forest Service Road 54 and a 3-mile by 2 feet wide handline along Forest Service Road 54 into the Blue Vista Overlook and along Burnt Corral Draw. Ground ignition occurred along Forest Service Road 54 to Highway 191 and along Highway 191 south to Forest Service Road 587. The areas impacted by ground suppression and ignition were approximately: 2.7 acres by bulldozer lines, 2,067 acres by burnout operations, 0.8 acre by handlines, and 2 acres by safety zones. Emergency stabilization efforts began on July 9, 2007 and concluded on July 25, 2007. Emergency stabilization is defined as planned actions that occur within one year of a wildland fire to stabilize the soil and prevent further degradation to natural and cultural resources and minimize threats to life or property resulting from the effects of a fire. Stabilization efforts included: cross felling on side slopes and within East Eagle Creek and upper East Eagle Creek, re-seeding and straw mulch at Blue Vista Overlook and Stray Horse Campground, bulldozer line re-seeding along the fence line adjacent to Forest Service Road 54, and Safety Zone re-seeding along Forest Service Road 54 and Baldy Bill Point. Aerial seeding of crown and high severity burned areas also occurred. No other activities have been planned.

Aerial suppression/ ignition

Aerial suppression consisted of water tenders and helicopter bucket work primarily along Forest Service Road 54, and a helitanker to contain spot fires that ignited north of Forest Service Road 54 in the Bear Wallow Wilderness. The water dip sites for the helicopter and helitanker were Ackre Lake and Sierra Blanca Lake, respectively, in which, approximately 64,017 gallons of water was dropped to control the fire. Flights over the action area consisted of an estimated 35 to 45 water-only drops by helicopters at an altitude of approximately 200 feet, 20 to 30 flights of aerial strip lighting at approximately 100 to 500 feet, and 50 to 60 observational flights by a fixed-wing aircraft at an altitude of approximately 2,000 to 3,000 feet. Approximately 20,902 gallons of fire-retardant was applied in the upper portions of Chitty Creek with a significant amount released north of Forest Service Road 54. Two air tankers and four Single Engine Air Tankers (SEATS) completed a total of twelve fire-retardant drops at an approximate altitude of 500 to 1,000 feet at the north perimeter and over a 0.25 mile above Chitty Creek. Fire-retardant

use was to contain a spot fire in the Bear Wallow Wilderness within five acres; however, because it did little to modify fire behavior, all application was ceased after July 3, 2007.

The action area includes the Chitty Creek Restoration Project boundary (22410-2004-F-0006), the estimated area impacted by noise and smoke dispersal, the flight paths to and from the water dip sites, and the upper portion of Eagle Creek as described in the Environmental Baseline section. A more detailed description of ground and aerial suppression/ignition operations within the fire perimeter is found within the Effects of the Action section of this biological opinion. For additional information and more specific details concerning suppression actions for the Chitty Wildfire, please refer to the Emergency-Fire Documentation form, BAE addendum, and maps provided by the Forest for this consultation.

STATUS OF THE SPECIES AND CRITICAL HABITAT

Mexican spotted owl

The MSO was listed as a threatened species in 1993 (USFWS 1993). The primary threats to the species were cited as even-aged timber harvest and stand-replacing 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 (USDI 1995). Critical habitat was designated for the MSO in 2004 (USFWS 2004). 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 U.S. 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, uneven-aged forest, and the species is known to inhabit a physically diverse landscape.

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 MSO in the U.S. 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 two National Forests in Colorado and three in Utah) support fewer owls. According to the Recovery Plan, 91 percent of MSO known to exist in the U.S. between 1990 and 1993, occurred on lands administered by the Forest Service.

Historical and current anthropogenic uses of MSO habitat include both domestic and wild ungulate grazing, recreation, fuels reduction treatments, resource extraction (e.g., timber, oil, gas), and development. These activities have the potential to reduce the quality of MSO nesting, roosting, and foraging habitat, and may cause disturbance during the breeding season. Livestock and wild ungulate grazing is prevalent throughout Region 3 National Forest lands and is thought to have a negative effect on the availability of grass cover for prey species. Recreational impacts are increasing on all forests, especially in meadow and riparian areas. There is anecdotal information and research that indicates that owls in heavily used recreational areas are much more erratic in their movement patterns and behavior. Fuels reduction treatments, though critical to reducing the risk of severe wildfire, can have short-term adverse effects to MSO through

habitat modification and disturbance. As the human population grows, especially in Arizona, small communities within and adjacent to National Forest System (NFS) lands are being developed. This trend may have detrimental effects to MSO by further fragmenting habitat and increasing disturbance during the breeding season. West Nile Virus also has the potential to adversely impact the MSO. The virus has been documented in Arizona, New Mexico, and Colorado, and preliminary information suggests that owls may be highly vulnerable to this disease (Courtney et al. 2004). Unfortunately, due to the secretive nature of owls and the lack of intensive monitoring of banded birds, we will most likely not know when owls contract the disease or the extent of its impact to MSO range-wide.

Currently, high-intensity, stand-replacing fires are influencing ponderosa pine and mixed conifer forest types in Arizona and New Mexico. Uncharacteristic, severe, stand-replacing wildfire is probably the greatest threat to MSO. As throughout the West, fire severity and size have been increasing within this geographic area.

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. USFWS (1991) reported a total of 2,160 owls throughout the U.S. 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 1,025 protected activity centers (PAC) established on NFS lands in Arizona and New Mexico (B. Barrera, pers. comm. 2007). The Forest Service Region 3 data are the most current compiled information available to us; however, survey efforts in areas other than NFS lands have resulted in additional sites being located in all RUs.

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" (Gutierrez et al. 2003), found that reproduction varied greatly over time, while survival varied little. The estimates of the population rate of change ($\Lambda = \text{Lambda}$) indicated that the Arizona population was stable (mean Λ from 1993 to 2000 = 0.995; 95 percent Confidence Interval = 0.836, 1.155) while the New Mexico population declined at an annual rate of about 6 percent (mean Λ from 1993 to 2000 = 0.937; 95 percent Confidence Interval = 0.895, 0.979). The study concludes that spotted owl populations could experience great (>20 percent) fluctuations in numbers from year to year due to the high annual variation in recruitment. However, due to the high annual variation in recruitment, the MSO is then likely very vulnerable to actions that impact adult survival (e.g., habitat alteration, drought, etc.) during years of low recruitment.

Since the owl was listed, we have completed or have in draft form a total of 212 formal consultations for the MSO. These formal consultations have identified incidences of anticipated incidental take of MSO in 426 PACs. The form of this incidental take is almost entirely harm or harassment, rather than direct mortality. These consultations have primarily dealt with actions proposed by Forest Service Region 3. However, in addition to actions proposed by 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 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. The jeopardy opinion issued for existing Forest Plans on November 25, 1997 was rendered moot as a non-jeopardy/no adverse modification Biological Opinion was issued the same day.

In 1996, we issued a biological opinion on Forest Service Region 3 adoption of the Recovery Plan recommendations through an amendment to their Land and Resource Management Plans (LRMPs). 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. In addition, on January 17, 2003, 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. Consultation on individual actions under these biological opinions anticipated incidental take in the form of harm and/or harassment of owls associated with 243 PACs on Region 3 NFS lands. Forest Service Region 3 reinitiated consultation on the LRMPs on April 8, 2004. On June 10, 2005, the FWS issued a revised biological opinion on the amended LRMPs. We anticipated that while the Region 3 Forests continue to operate under the existing LRMPs, take is reasonably certain to occur to an additional 10 percent of the known PACs on NFS lands. We expect that continued operation under the plans will result in harm to 49 PACs and harassment to another 49 PACs. To date, consultation on individual actions under the amended Forest Plans, as accounted for under the June 10, 2005, biological opinion has resulted in the incidental take of owls associated with 43 PACs. Incidental take associated with Forest Service fire suppression actions, which was not included in the LRMP proposed action, has resulted in the incidental take of owls associated with 25 PACs.

Mexican spotted owl critical habitat

The final MSO critical habitat rule (USFWS 2004) designated approximately 8.6 million acres of critical habitat in Arizona, Colorado, New Mexico, and Utah, mostly on Federal lands (USFWS 2004). Within this larger area, critical habitat is limited to areas that meet the definition of protected and restricted habitat, as described in the Recovery Plan. Protected habitat includes all known owl sites and all areas within mixed conifer or pine-oak habitat with slopes greater than 40 percent where timber harvest has not occurred in the past 20 years. Restricted habitat includes mixed conifer forest, pine-oak forest, and riparian areas outside of protected habitat.

The primary constituent elements for MSO critical habitat were determined from studies of their habitat requirements and information provided in the Recovery Plan (USDI 1995). Since owl habitat can include both canyon and forested areas, primary constituent elements were identified in both areas. The primary constituent elements which occur for the MSO within mixed-conifer, pine-oak, and riparian forest types that provide for one or more of the MSO's habitat needs for nesting, roosting, foraging, and dispersing are in areas defined by the following features for forest structure and prey species habitat:

Primary constituent elements related to forest structure include:

- 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 percent to 45 percent of which are large trees with diameter-at-breast height (dbh) of 12 inches or more;
- A shade canopy created by the tree branches covering 40 percent or more of the ground; and,
- Large, dead trees (snags) with a dbh of at least 12 inches.

Primary constituent elements related to the maintenance of adequate prey species include:

- High volumes of fallen trees and other woody debris;
- A wide range of tree and plant species, including hardwoods; and
- Adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration.

The forest habitat attributes listed above usually are present with increasing forest age, but their occurrence may vary by location, past forest management practices or natural disturbance events, forest-type productivity, and plant succession. These characteristics may also be observed in younger stands, especially when the stands contain remnant large trees or patches of large trees. Certain forest management practices may also enhance tree growth and mature stand characteristics where the older, larger trees are allowed to persist.

There are 13 critical habitat units located in the Upper Gila Mountains RU that contain 3.1 million acres of designated critical habitat.

Gila chub

The Gila chub was listed as endangered with critical habitat in 2005 (USFWS 2005). An estimate on the number of Gila chub throughout its range is not available. Historically, Gila chub have been recorded in approximately 43 rivers, streams, and spring-fed tributaries throughout the Gila River basin in southwestern New Mexico, central and southeastern Arizona, and northern Sonora, Mexico (Miller and Lowe 1967; Rinne and Minckley 1970; Minckley 1973; Rinne 1976; DeMarais 1986; Weedman et al. 1996). However, since 2000, only twenty-nine of these populations remain occupied, and all of these are small, isolated, and threatened (Weedman et al. 1996; USFWS 2005). These twenty-nine populations occur in tributaries of the Agua Fria, Babocamari, Gila, San Francisco, San Pedro, Santa Cruz, and upper Verde rivers in Cochise, Coconino, Gila, Graham, Greenlee, Pima, Pinal, Santa Cruz, and Yavapai counties in Arizona, and in Grant County, New Mexico. Of these populations, ten are estimated to be stable-threatened, meaning the Gila chub are considered common to uncommon, potential threats from non-native species exists, some habitat-altering land uses occur, or lack of recruitment was detected in the population. The remaining nineteen are considered unstable-threatened, indicating that Gila chub are rare, have a limited distribution, predatory or competitive non-native species are present, or the habitat is modified or threatened (Weedman et al. 1996; USFWS 2005).

Threats to Gila chub include predation by and competition with non-native organisms, including fish in the family Centrarchidae (*Micropterus* spp., *Lepomis* spp.), other fish species, bullfrogs (*Rana catesbeiana*), and crayfish (*Orconectes virilis*); disease; and habitat alteration, destruction, and fragmentation resulting from water diversions, dredging, recreation, roads, livestock grazing, changes in the natural flow pattern, mining, degraded water quality (including contaminants from mining activities and excessive sedimentation), and groundwater pumping (USFWS 2002). Riparian and aquatic communities across the southwest have been degraded or destroyed by human activities (USFWS 2005). Thus, Gila chub has been eliminated from approximately 85 to 90 percent of its range due to activities that have degraded or destroyed the species' habitat. Today, much of the remaining Gila chub habitat is still extensively grazed, current mining operations still operate in its watersheds and increased recreation use adds to habitat alteration while the introduction of non-native species contribute to habitat degradation. With populations small and isolated, they are vulnerable to natural and manmade factors that might further reduce its population size, such as drought, floods, and wildfires.

Wildfires pose a threat to the remaining extant populations. Over the last fifteen years, the frequency and intensity of wildfires have increased due to drought conditions, historical wildfire suppression policies, and increased recreational activities on public lands. Forests that historically burned at low intensity at regular intervals now rarely burn, but when they do, the wildfire often escalates at a severe, stand-replacing intensity (USFWS 2005). In the southwest, wildfires frequently occur during or prior to the summer monsoon season. As a result, wildfires are often followed by rains that wash ash-laden debris into streams that usually impact fish species due to watershed degradation that can negatively impact survival and devastate populations (Rinne 2004; Rhodes 2007). Effects from a wildfire can directly impact fish species by causing changes in water temperature and water chemistry that in turn, degrade a healthy aquatic community and the conditions to support fish species (i.e., food, cover, breeding opportunities). Smoke contributes nitrogen and ammonia which is toxic to fish. The absorption of smoke and nitrogen into the water depends on the amount of time the smoke lingers over the water. Heavy ash and soot loads clog the gills of fish and lead to acute and chronic chemical effects.

Indirect effects of wildfires include alterations of the watershed that can alter the stream flow, water quality, riparian vegetation, and instream sedimentation loads, all of which can drastically alter Gila chub habitat. A study by Earl and Blinn (2003) investigated ash runoff in the Gila River following a moderate severity fire and found that coarse ash (2 mm) and fine ash (silt like) could be transported down a system 29.5 feet and 426.5 feet respectively at 0.3 gallons per second. These distances are further exaggerated with additional precipitation. The study also found that ash had a dramatic effect on water quality (i.e. an increase in peak concentration of ions), but the effects were short lived as water quality returned to pre-fire levels within 4 months. Macro-invertebrate densities also appeared to decline in response to ash inputs but in cases where ash consisted of coarse burned and unburned detritus material (Earl and Blinn 2003). The researchers found that in the long-term, the Gila drainages were resilient partly due to the ability of ponderosa pine to burn at lower intensity and thus less likely to undergo severe erosion, although they may burn more frequently. Fire suppression tactics can also cause adverse effects to Gila chub habitat from vegetation removal, road building, or using fish habitat as water sources for fire fighting. For more details on the effects of wildfire on Gila chub, refer to the Consultation 22410-03-F-0210 (Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management).

Gila chub critical habitat

Critical habitat for Gila chub is designated for approximately 160.3 miles of stream reaches in Arizona and New Mexico that includes: cienegas, headwaters, spring-fed streams, perennial streams, and spring-fed ponds. Critical habitat includes the area of bankfull width plus 300 feet on either side of the banks. The bankfull width is the width of the stream or river at bankfull discharge (i.e., the flow at which water begins to leave the channel and move into the floodplain) (USFWS 2005). Critical habitat is organized into seven areas or river units, in which, Eagle Creek and East Eagle Creek are within Area 1, referred as the Upper Gila River (USFWS 2005). There are seven primary constituent elements, which include those habitat features required for the physiological, behavioral, and ecological needs of the species:

- 1) Perennial pools, areas of higher velocity between pools, and areas of shallow water among plants or eddies all found in headwaters, springs, and cienegas, generally of smaller tributaries;
- 2) Water temperatures for spawning ranging from 63°F to 75 °F, and seasonally appropriate temperatures for all life stages (varying from about 50°F to 86 °F);
- 3) Water quality with reduced levels of contaminants, including excessive levels of sediments adverse to Gila chub health, and adequate levels of pH (e.g. ranging from 6.5 to 9.5), dissolved oxygen (i.e., ranging from 3.0 ppm to 10.0 ppm) and conductivity (i.e., 100 mmhos to 1,000 mmhos);
- 4) Prey base consisting of invertebrates (i.e., aquatic and terrestrial insects) and aquatic plants (i.e., diatoms and filamentous green algae);
- 5) Sufficient cover consisting of downed logs in the water channel, submerged aquatic vegetation, submerged large tree root wads, undercut banks with sufficient overhanging vegetation, large rocks and boulders with overhangs, a high degree of stream bank stability, and a healthy, intact riparian vegetation community;
- 6) Habitat devoid of non-native aquatic species detrimental to Gila chub or habitat in which detrimental nonnative species are kept at a level that allows Gila chub to continue to survive and reproduce; and
- 7) Streams that maintain a natural flow pattern including periodic flooding.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions within 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.

Description of the Action Area

The entire action area lies within the Chitty Creek Restoration Project (22410-04-F-0006). For this consultation, the Chitty Wildfire action area includes the 15,066 acres that were identified as the Chitty Wildfire perimeter following 100 percent containment (Appendix C, Table 1); and the area impacted by smoke and aerial operations. This area is defined as extending past the Chitty Wildfire perimeter to approximately 8 miles north into the Alpine Ranger District, 8 miles northwest towards the Graham-Greenlee County border, and approximately 8 miles northeast from Stray Horse administrative site (Appendix B, Figure 1). The action area also includes a flight corridor to and from the Chitty Wildfire perimeter to Sierra Blanca Lake in Apache County, East Eagle Creek and approximately 3 stream miles of upper Eagle Creek from its confluence with Dry Prong and East Eagle Creek to Honeymoon Campground.

Distances of downstream effects of ash and sediment flow and for smoke dispersal are difficult to estimate because these distances can be influenced by a variety of factors. Therefore, consideration was given to the short-term effects that may occur in response to suppression actions. Smoke dispersal distances were based on information from Chitty Creek Restoration Project BAE and Schmidt et al. (2002). It was assumed that since Ackre Lake was a water dip site, the area around the lake had primarily clear visibility but effects to visibility beyond the lake could not be determined. Flight patterns were assumed to follow an established linear flight corridor with an entrance and exit flight path, with exception of the observation aircraft.

A. Status of the species and critical habitat within the action area

Mexican spotted owl and critical habitat

There are twenty-one MSO PACs within the action area (Appendix C, Table 2). The Blue Vista PAC (101304) is located inside the wildfire perimeter. It was designated in 2002 and encompasses 695 acres. Surveys from 2001 to 2004 confirmed occupancy of a MSO pair and a nestling was observed in 2005. Informal post-fire surveys that were completed in August 2007 observed a single female MSO on three separate occasions. Surveys were also completed for three PACs located within a mile north of the wildfire perimeter: Upper KP Creek (10127), Double Cienega (10136), and the Rim (10151). Informal monitoring of the Upper KP Creek and Double Cienega occurred in 1993 and 1998 respectively but no response by a MSO was recorded during this time. In the Rim PAC, a male was detected in 1993 but no nesting was observed. The remaining fifteen PACs are located two miles and more north of the wildfire perimeter with varying reports of occupancy. However, we consider all of these PACs to have been occupied prior to and leading up to the Chitty Wildfire suppression actions based on the following: the MSO Recovery Plan's recommendation for retention of PACs, the potential of adult survival to reach 16 years or more, high site fidelity of MSO once territories and home ranges have been established, and the potential recruitment of floaters into a territorial population (USDI 1995; USFWS 2004).

The action area occurs along the Mogollon Rim and is entirely within the critical habitat unit Upper Gila Mountains RU-7. The Upper Gila Mountains RU-7 is essential to the conservation of the species and currently possesses the primary constituent elements required for nesting, roosting, foraging, and dispersal. The habitat within the Blue Vista PAC is mixed conifer, with a small portion of ponderosa pine-Gamble oak community (Brown 1994). The terrain is

characterized as level to steep elevated plains, hills, and mountains with slopes ranging up to 80 percent. Ground cover is approximately 1.6 inches to 5.5 inches thick of conifer needle litter, and herbaceous vegetation. Within restricted habitat, the vegetation community is comprised of mixed conifer in the northern portions of the action area and ponderosa pine-oak woodlands along Chitty Creek and Salt House Creek drainages. It is characterized as occurring on level to steep elevated plains, hills, and mountains, with up to 80 percent slope in some areas. Ground cover is 1.6 inches to 3.2 inches thick of a continuous layer of pine needle litter and herbaceous vegetation. Within the Chitty Wildfire perimeter, 695 acres of protected and 3,929 acres of restricted MSO habitat occur.

Gila chub and critical habitat

Gila chub have been found within the Eagle Creek drainage since 1999 and as of recently, their population constitutes about 6 percent of the native fish populations within the drainage (Marsh et al. 2007). Surveys completed by Forest biologists in March 2000, found Gila chub in upper Eagle Creek at its confluence with Dry Prong Creek downstream to Honeymoon Campground (USFS 2000). Sampling trips during June 2005 to June 2007, confirmed occupancy of Gila chub at Honeymoon Campground in addition to, other sites located downstream and outside of the action area (Marsh et al. 2005; Marsh et al. 2006; Marsh et al. 2007). In each subsequent year, the number of individuals found downstream appeared to be declining and by 2007, individuals were found only at Honeymoon Campground. Four other native species are found at Honeymoon Campground and these include: Longfin dace (*Agosia chrysogaster*), speckled dace (*Rhinichthys osculus*), Sonora sucker (*Catostomus insignis*) and desert sucker (*Pantosteus clarki*). The presence of Gila chub in East Eagle Creek is undocumented and unknown. An October 2008 field inspection identified dace species in Upper East Eagle Creek from the confluence of Salt House Creek to Crabtree Creek. The Gila chub population in East Eagle Creek and Eagle Creek is considered unstable and threatened because their occurrence is rare with a limited distribution (USFWS 2005).

Gila chub critical habitat within the action area includes all stream reaches in Eagle Creek and East Eagle Creek affected by suppression and stabilization activities. Critical habitat extends from the confluence to Eagle Creek with an unnamed tributary upstream to its confluence with East Eagle Creek, and including East Eagle Creek to its headwaters that are south of Highway 191 (USFWS 2005). Elevation within the East Eagle drainage lies between 5560 feet and 8760 feet (USFS 2005) dominated by stands of cottonwood-willow at lower elevations. Canopy closure varies from approximately 30 percent to 50 percent and vegetation is patchy and discontinuous (USFS 2005). Upper East Eagle Creek is within a montane riparian community that transitions to interior deciduous riparian forest (Brown 1994) dominated by maples, alders, gambel oaks, and ponderosa pine. Ephemeral riparian areas are found in the portions of upper Eagle Creek. Riparian areas with perennial waters are found within 0.25 mile of East Eagle Creek and 3 miles of Eagle Creek. Intermittent flows in East Eagle Creek occur approximately 0.3 mile from its confluence with Dry Prong where it becomes dry from May to July. Two high flow events typically occur in both East Eagle and Eagle Creek during monsoonal activity in summer and spring runoff (Marsh et al. 1990).

Both East Eagle Creek and the upper portion of Eagle Creek contain one or more primary constituent elements: permanent pools with riffles, run areas between these pools and vegetative cover (USFWS 2005). Eagle Creek is considered a type C channel (i.e., slightly entrenched, riffle/pools, cobble-dominated substrate) which is vulnerable to significant alterations caused by

changes in bank stability, watershed conditions, or flow regimes (Rosgen 1996). The substrate in upper Eagle Creek primarily consists of sand and cobble. Bankside vegetation consists of willow and alder with warm season gramma grasses. Pools and riffles within Eagle Creek have been altered or destroyed during past flood events. For example, in August 1999, a flash flood in Eagle Creek carried large amounts of woody debris downstream which moved and re-deposited riparian vegetation and rock cobble within the system. This high flow event subsequently created sand bars, cut banks, and deep pools that are suitable for non-native species. A second flood event occurred in 2007 following the Chitty Wildfire (L. Brown, pers. comm. 2008) that also transported and re-deposited cobble and sedimentation throughout Eagle Creek. East Eagle Creek is a type A-B (i.e. steep, entrenched, and confined channels; Rosgen 1996) comprised of rock, cobble, and bedrock substrate (22410-00-F-0298). East Eagle Creek was also affected by high flow events in 1999, 2005, and 2007 that restructured the stream channel (USFS 2005). Information about the current condition of East Eagle Creek is limited.

B. Factors affecting the species within the action area

Mexican spotted owl and critical habitat

Past and ongoing factors affecting MSO in the action area include recreation, grazing, fish reintroduction, timber harvest practices and wildfire. The entire action area falls within Arizona Game and Fish Department's Game Management Unit 27. Hunting, fishing, and associated activities such as horseback riding, scouting, hiking, all terrain vehicle travel, and camping have and will continue to occur in the action area during the implementation of the action and after it is completed. Of the twenty-one PACs in the action area, nearly all are accessible by hiking trails and many are adjacent to maintained or primitive roadways. Additionally, most PACs are located in canyon habitat associated with perennial streams suitable for recreational fishing.

The occurrence of high-severity, stand replacing wildfires has significantly contributed to the owl's current status and probably remains the greatest threat to the subspecies. Habitat conditions (e.g. densely stocked forests over mature chaparral) in the action area contribute to the likelihood of the occurrence of a stand-replacing fire. Since 2000, approximately 4,125 acres in the action area, including eight MSO PACs have been impacted by wildfires and associated suppression actions (Appendix C, Table 3). Approximately 6,999 acres of MSO critical habitat were determined to be actually burned from the combination of wildland fire and suppression efforts after follow-up mapping efforts by the ASNF in the fall of 2008.

Of the 695 acres designated as the Blue Vista PAC, approximately 62 percent were consumed by the Chitty Wildfire. Within protected habitat, 150 acres and 294 acres received crown and high intensity fire burns, respectively, which altered the primary constituent elements for MSO prey base in the short-term and forest structure in the long term (e.g. range of tree species, snags, and alteration of vegetation community). In the upper reaches of the Blue Vista PAC, approximately 249 acres consisting of remnant mixed conifer stands burned at moderate fire intensity in which, some portions of the primary constituent elements were likely retained. Adverse effects from suppression actions for the Thomas, Steeple, and KP wildfires that occurred during 2003 to 2004 in the action area are currently being analyzed through section 7 consultation between the FWS and the Forest. These fires, although contained prior to the final designation of MSO critical habitat (August 31, 2004), affected six PACs with approximately 3,376 acres being consumed within protected habitat (Appendix C, Table 3). The Hannagan Creek (101015) and Foote Creek (101060) PACs were both burned by the Thomas Fire which consumed 157 and 653 acres in

each, respectively. The Steeple and KP Fires affected four PACs: Lower KP Creek (101028), Rim (101051), Upper KP Creek (101027) and Butterfly (101054). The Hannagan Creek PAC was also affected by the Beaverhead Fire and underwent emergency consultation (22410-2006-FE-0452). The Beaverhead Fire consumed 2,105 acres. Of this amount, 52 acres were burned inside the Hannagan Creek PAC while 101 acres of restricted habitat was burned from associated burnout activities. In the consultation which concluded on February 14, 2008, we determined that emergency suppression actions resulted in incidental take from short-term harassment to owls within the Hannagan Creek PAC. The Blue Vista Fire also occurred in the action area; however, emergency consultation has not been completed.

To reduce the threat of high-severity wildfires in the Chitty Creek area, the Forest initiated the Chitty Creek Restoration project to conduct prescription burning and understory thinning. Phase I of the 10-year project began in fall 2006 and with Phase II scheduled for spring 2007 (02-21-04-F-0006). By October 2006, understory thinning was completed in the upper portions of Chitty and Salt House Creeks and the area above the Mogollon Rim on the Alpine Ranger District. Because the Chitty Wildfire occurred within the Restoration project area, prescription burn treatments scheduled for the area that includes the Blue Vista PAC are no longer required in the short term. In the long term, the condition of the vegetation and amount of ground fuel that may accumulate from fallen burnt embers will be re-evaluated and pending monitoring results, treatments in the area may be scheduled.

Ten grazing allotments under varying stages of use are within the action area (East Eagle, Strayhorse, KP, Sprucedale-Reno, Fish Creek, Hannagan, Steeple Mesa, Fish Hook, Foote Creek, and Beaver Creek). The East Eagle Creek and Strayhorse allotments are located within the wildfire perimeter and of the two, only East Eagle is currently stocked. The Strayhorse allotment, containing the Blue Vista PAC, has not been stocked since 1999 (L. Brown, pers. comm. 2008). The remaining allotments are located north of the action area on the Alpine Ranger District. The KP and Hannagan allotments are currently not active and have been rested for about 10 years. However, the KP allotment requested winter grazing rights for 2008 (M. Willis, pers. comm. 2008). The Sprucedale-Reno, Fishhook, and Steeple Mesa allotments are active and practice a rotational deferred system with browse and forage utilization of 20 percent to 40 percent within former MSO critical habitat.

Formal consultations for the proposed authorization or reauthorization of livestock grazing and affects to MSO were conducted for the KP, Fishhook-Steeple Mesa, and Foote Creek allotments. In 2001, proposed designated critical habitat in Greenlee County was removed because of the exclusion of critical habitat on National Forest lands. As such, consultations of "may affect" to MSO critical habitat was not considered for these allotments at the time. The final MSO critical habitat rule (USFWS 2004) includes these allotments in the designation. The FWS made non-jeopardy determinations in these cases and no incidental take was anticipated (Blue and San Francisco Grazing Consultation).

Apache trout reintroduction within the action area underwent formal consultation in 2002 (22410-02-F-101) and was reinitiated in 2004 (22410-02-F-101 R2), due to the construction of fish barriers within several PACs. Incidental take, in the form of harassment, was anticipated for all MSOs within seven PACs during barrier construction over a two-year period: Fish Creek (101002), Conklin Creek (101003), Upper Conklin Creek (101004), Slaughter Draw (101005), Middle Turkey Creek (101018), Double Cienega (101036), and Turkey Track (101056). The Hoodoo Timber Stand Improvement (TSI) Project also occurred in the action area and underwent

formal consultation in 1997 (22410-97-F-063). The project involved pre-commercial thinning of 312 acres to improve forest health. The FWS anticipated incidental take for up to four pairs of MSO associated with three PACs (Conklin Creek (101003), Upper Conklin Creek (101004) and (Slaughter Draw (101005)) and unsurveyed habitat located outside of designated PACs that may have been capable of supporting one MSO PAC.

Gila chub and critical habitat

Past and ongoing threats to Gila chub and its critical habitat in the action area include activities such as recreation, roads, and grazing; flooding, wildfires, and predation by and competition with non-native organisms. Ground disturbing recreation activities such as all terrain vehicle travel has not historically contributed to Eagle Creek degradation but in combination with annual high flows, contributes to impacts on water quality and channel morphology. Fishing, hunting, and camping also occur in the area. The Forest estimates that about 400 recreational visitors use Honeymoon Campground and Eagle Creek trailhead. Honeymoon Campground, built on an alluvial terrace at the outward bend of Eagle Creek, is threatened by natural erosion. The FWS completed formal consultation with the Forest in October 2000 for stream bank stabilization at Honeymoon Campground to repair damage from the August 1999 flood. In the Effects of the Action section, it was noted that bank stabilization repairs occurred at this location three previous times. Bank stabilization efforts and other flood control measures can have ramifications in regards to erosion caused by previous control measures and thereby expanding the area that is in need of stabilization work.

Critical habitat within the action area is accessible by trails and primitive roadways. Road density in the upper Eagle Creek watershed is about 0.65 miles per square mile, including approximately 10 miles of paved highway, 11 miles of surfaced, all-weather road, and 44 miles of mixed unimproved or low-maintenance four-wheel drive tracks (22410-00-F-298). These roads have contributed to bank erosion and increased inputs of sedimentation from stream crossings and road cuts. Maintenance or repair of three roads crossings in upper Eagle Creek is regularly required due to annual high flow events from monsoons and spring runoff. Maintenance typically includes restructuring of the streambank to remove large rocks, fill pools, maintain bank slopes, and provide wide and shallow stream crossing. Recent efforts below Honeymoon Campground in response to high flows in 2007 may have potentially caused the loss of riffle habitat or become barriers to fish movement (Marsh et al. 2008).

The risk of wildfires continues to be a threat based on the existing heavy fuel load and drought conditions within the action area. The Chitty Wildfire burned approximately 3.1 stream miles of Gila chub critical habitat in upper East Eagle Creek. The amount of acres that were burned from the wildfire was estimated to be 699 acres, of which, 245 acres were burned by a crown and high intensity fire (Appendix C, Table 4). The resulting high burn severity on the soil can increase soil runoff from the loss of ground cover and subsequently lead to erosion in stream channels. In combination with periodic precipitation, ash and sedimentation can be washed through the entire system. Subsequent changes to water quality, habitat, and substrate can also increase the distribution of non-native species. Non-native species pose a significant threat to Gila chub. Since 1999, non-native crayfish have been found in upper Eagle Creek to its confluence with Dry Prong Creek. Recent sampling efforts at Honeymoon Campground indicate that densities of non-native northern crayfish (*Orconectes virilis*) have increased at this location and within the entire system (Marsh et al. 2008). Marsh et al. (2008) observed fin damage on native fish species presumed to be from crayfish interactions.

Livestock grazing can have a negative effect on Gila chub critical habitat by reducing stream bank stability, increased erosion, and increased water temperature through the removal of riparian vegetation and trampling along the banks. Historically, Eagle Creek was used primarily for grazing and caused substantial alteration of the watershed. However, grazing levels have since been reduced. Cooperative efforts by the Forest and private landowners have facilitated improvements to the riparian vegetation along Eagle Creek. These efforts have resulted in all grazing to be excluded from Eagle Creek; and livestock is only trailed along East Eagle twice per year. In addition, the East Eagle allotment will be rested from grazing during the Chitty Restoration project to ensure herbaceous recovery. Rest is expected to last at least two full growing seasons, and will be monitored by ASNF range management staff.

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.

Mexican spotted owl and critical habitat

Associated burnout activities within the Blue Vista PAC consisted of limited roadside preparation and ground ignition (Appendix C, Table 5) that likely resulted in a behavioral disturbance to MSO. Ground ignition within the Blue Vista PAC consumed 175 acres, of which, 85 acres burned at high severity. Impacts from the high severity burn included the loss of the nesting tree and roosting sites, in addition to, the reduction or loss of available canopy cover the removal or loss of ground vegetation, herbaceous plants, and trees that are associated with the primary constituent elements related to forest structure and adequate prey species. The remaining 90 acres burned at low to moderate severity that likely retained some primary constituent elements, reduced the amount of ladder fuels, and reduced the risk of future crown fires, thus removing the need for post-fire rehabilitation. However, because the wildfire was burning inside the Blue Vista PAC at the same time that a high severity fire started from handfiring, it is difficult to differentiate effects to the MSO from ground suppression activities.

Few studies have examined the long-term direct effects of wildfire and MSO and results are uncertain. Bond et al. (2002) studied spotted owls across their range in the western U.S. immediately following wildfires, which consumed both nest and roost sites. The researchers found that 86 percent of owls survived and were resighted the following year. Furthermore, 57 percent of pairs produced a fledgling a year after the wildfire. Jenness (2000) found that the percentage of pine trees in a burned area had more influence on the response of MSO and that the presence of a wildfire did not appear to affect the presence or reproduction of MSO. This study did not include nest sites, and therefore effects to nests could not be determined. Mexican spotted owls have likely evolved with regular low-intensity fires (Jenness 2000) and similarly, ponderosa pine and Douglas fir are resistant to low severity fires. Taking these studies into consideration plus suppression actions on MSO critical habitat, the effects to the MSO in the Blue Vista PAC likely included stress or injury from the combination of high heat, flames, and

smoke; and changes in MSO distribution and nesting opportunities. Foraging capabilities were reduced in the portions that received high severity, which likely killed or injured some prey species. Foraging however, may improve immediately following the fire in areas impacted by low intensity burns that removed herbaceous cover and stimulated deer mice populations. However, these prey increases tend to be relatively short-term and if nesting and roosting habitat is modified, even with increased prey, MSO may not have the habitat they need to meet all of their needs in the long-term.

Noise effects are likely negligible to the Blue Vista PAC since aerial suppression did not occur near or adjacent to the PAC. Disturbance to a nesting or roosting MSO from aircrafts is greatest the closer these actions occur to the owl's core area. Delaney et al. (1999) found that helicopter flights flushed MSO 50 percent of the time within 98 feet, 19 percent within 197 feet, 14 percent within 344 feet, and no disturbance was recorded beyond 344 feet. Although the observational aircraft flew continuously over the action area, the above ground elevation was beyond the distance (i.e. observational aircraft altitude was between 2,000 to 3,000 feet) that elicits a flush response from MSO.

Burnout operations within restricted habitat consisted of aerial ignition, retardant and water drops, ground ignition, fire lines, and stabilization efforts. Aerial and ground ignition consumed 1,004 acres of which, 730 acres burned at high to moderate intensity within ponderosa pine-Gambel oak woodlands and mixed conifer located in Salt House and Chitty Creek drainages. Impacts associated with these burn severities likely resulted in potential habitat loss and loss of primary constituent elements related to forest structure and maintenance of adequate prey species. The remaining 247 acres burned at moderate severity and may have reduced the opportunity for a future crown fire by means of consuming surface fuels. The creation of the dozer line and hand line may have contributed to soil compaction and erosion. Other impacts that may occur from these control lines is the increased risk of non-native species occurrence, particularly with dozer lines, due to the removal of ground cover to exposed mineral soil. However, reseeding in these areas likely will reduce some of these negative effects.

Outside of the wildfire perimeter, the effects of smoke associated with aerial and ground ignition along Forest Service Road 54 likely impacted four PACs located within a mile of the wildfire perimeter: Blue Wallow Shell (101021), Upper KP Creek (101027), Double Cienega (101036), and the Rim (101051). Impacts from the smoke likely caused short-term displacement or a flush response from MSOs in the nest, and/or inhibited foraging activities due to potential reduced visibility within the PAC. The effects of smoke on MSO located beyond two miles of the wildfire perimeter may have caused short-term behavioral disturbances such as a flush response, but these were likely minimal: Fish Creek (101002), Conkline Creek (101003), Upper Conklin Creek (101004), Slaughter Draw (101005), Thomas Creek (101013), Willow Creek (101014), Hannagan Creek (101015), Middle Turkey Spring (101018), NW Bear Wallow Confluence (101022), Fish Barrier (101023), Lower KP Creek (101028), Hagen Creek (101035), Butterfly (101054), Turkey Track (101056), and Foote Creek (101060). However, we recognize that the amount of acres burned from suppression actions were almost equal to the amount of acres burned from the Chitty Wildfire within the same areas (i.e., suppression resulted in 658 acres being burned in a crown to high intensity fire whereas, 896 acres burned in a crown to high intensity fire from the wildfire) (Appendix C, Table 1). Given the situation where the wildfire and the fire started by suppression activities were burning simultaneously at relatively the same intensity, it is impossible to differentiate smoke effects produced by the wildfire to those from burnout operations on MSO with any degree of certainty.

The effects of noise associated with aerial suppression may have resulted in a short-term behavior disturbance on MSO. Although the exact flight path pattern is unknown, helicopter flights performing aerial ignition between 100 to 500 feet above ground and flights occurring to and from Ackre and Sierra Blanca Lake at 200 feet above ground potentially elicited a flush response to five PACs located near the Chitty Wildfire perimeter or near areas where water drops were made (potential flight path): Conklin Creek (101003), Slaughter Draw (101005), Bear Wallow Trail 62 (101034), Hagen Creek (101035), and Butterfly (101054). Although current survey or monitoring data are not available for these PACs, we assume that they are occupied given the abundance of suitable habitat. Aerial water bucket and retardant drops were concentrated along Forest Service Road 54, however, neither occurred inside or adjacent to a PAC and retardant was dropped 300 feet away from major drainages.

Gila chub and critical habitat

Burnout operations from Highway 191 worked downslope to along the banks of East Eagle Creek with 1,248 acres burned from ground ignition activities. More specifically, ground ignition activities resulted in a crown and high intensity fire adjacent to the Chitty Wildfire that burned 276 acres near the headwaters of East Eagle Creek as well as, downstream and an area east of East Eagle Creek. Suppression activities also resulted in small patches of crown fires in nearby unnamed streams east of upper East Eagle Creek. Heavy loads of ash, soot, debris and particulates from smoke were likely deposited into the channel. Ground and aerial ignition in lower East Eagle Creek and in Crabtree Creek resulted in moderate fire intensities that burned 317 acres in these areas that likely modified soil properties, increasing the amount of sedimentation from runoff entering the channel. Low intensity burned area in East Eagle Creek likely had no adverse impact to Gila chub and its habitat but was beneficial in reducing the amount of ground fuel to prevent the further spread of the Chitty Wildfire. Stabilization efforts such as cross felling of dead large ponderosa pine within upper East Eagle Creek, likely contributed to reduced runoff and helped to stabilize the channel, but may have filled in pool habitats.

During and after the Chitty Wildfire, an accumulation of 10.14 inches of rain was recorded in the action area from June 30, 2007 to August 16, 2007. These high flow events likely transported all the ash, soot, and sedimentation in upper East Eagle Creek further downstream into occupied Gila Chub habitat. The amount of ash and sedimentation together with the heavy rainfall likely also contributed to down-cutting and scouring in upper East Eagle Creek. While the effects could not be quantified, information from the Forest suggests that the East Eagle Creek drainage has a reasonable opportunity to absorb short term (3 to 5 years) chronic inputs of sediment from natural fire regimes (e.g. low to moderate intensity) that should not reduce water quality or stream habitat beyond a stream mile within upper Eagle Creek (USFS 2005). However, suppression activities in upper East Eagle Creek likely contributed to short-term degradation in water quality in the entire system which affected the prey base and other ecological needs for Gila chub.

The Forest conducted an additional assessment of the Chitty Creek watershed to further explain the effects of both the Chitty Wildfire and associated suppression actions on downstream sedimentation that moved into occupied Gila chub critical habitat in Eagle Creek. Field observations within Chitty Creek and its upper watershed identified significant sheet erosion within crown and high fire intensity burned areas. The heavy rainfall and subsequent high flow

event contributed to substantial runoff that affected Chitty Creek watershed with subsequent ash and sediment flows down Chitty Creek, into less than a mile of Salt House Creek, into approximately 3.5 miles of East Eagle Creek and then into Eagle Creek. This likely degraded water quality and limited the quality and quantity of perennial pool habitat in Eagle Creek which is essential for the survival of Gila chub.

In a similar manner with MSO, the ground fires that contributed to erosion and soil runoff in Chitty and Eagle Creeks appeared to be equally shared by the Chitty Wildfire and associated suppression activities based on field observations and fire-intensity mapping (Appendix C, Table 4). Suppression activities resulted in 259 acres of crown and high intensity fires while the Chitty Wildfire resulted in 245 acres of crown and high intensity fires that both contributed to the amount of erosion occurring within the watershed. Given this fact, it is difficult to differentiate the effects to Gila chub and its habitat in Eagle Creek from suppression actions to those caused by the Chitty Wildfire and high flows that occurred during and after the wildfire.

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. Since the action occurred on Forest Service land, most actions that would occur in the action area would require additional section 7 consultation.

CONCLUSION

After reviewing the current status of MSO and Gila chub and their critical habitat, the environmental baseline for the action area, the effects of the emergency action and the cumulative effects, it is the FWS's biological opinion that the emergency action did not jeopardize the continued existence of the MSO and Gila chub and did not destroy or adversely modify designated critical habitat for the MSO and Gila chub.

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

We present these conclusions for the following reasons:

Mexican spotted owl

1. The implementation of the suppression actions is not expected to reduce the conservation value for MSO within the Upper Gila Mountain RU. Though suppression actions in critical habitat resulted in the loss of some primary constituent elements, the actions impacted approximately 6,999 acres (2,174 acres associated with the fire itself) of the 863,344 acres of critical habitat in Upper Gila Mountain RU-7 and therefore, have not significantly reduced the area's ability to contribute to the conservation status of MSO in this critical habitat unit.

2. Although portions of the protected and restricted habitat are currently unsuitable, we expect the biotic community to recover in the future and be able to sustain MSO.

Gila chub

1. High to moderate fire intensity burns from suppression activities in upper East Eagle Creek resulted in short-term adverse effects to water quality and critical habitat. Overall, the conservation value of the critical habitat is expected to be retained.
2. The majority of the fire caused by suppression activities burned at low to moderate intensity along streambanks where a small population of Gila chub is documented in Eagle Creek above Honeymoon Campground. Since vegetation has the ability to burn at low intensity and recover in the short-term, we expect that the conditions in East Eagle Creek and Eagle Creek will recover in the near future as well. Effects to Eagle Creek from inputs of ash and sediment were likely severe but also likely temporary and short-lived.
3. Post-fire rehabilitation and stabilization activities will help to minimize the amount of sedimentation entering East Eagle and Eagle Creeks and stabilize the channel to reduce additional runoff. Post-fire surveys have documented Gila chub in the system, indicating that essential habitat components still exist to sustain a population. Overall, the conservation value of the critical habitat is expected to be retained.

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 the 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.

For the purposes of evaluating incidental take of MSO from the action under consultation, incidental take can be anticipated as either the direct mortality of individual birds or the alteration of habitat that affects behavior (i.e. breeding or foraging) of birds to such a degree that essential behaviors are impaired and individual birds are thus "taken." They may fail to breed, fail to successfully rear young, raise less fit young, or desert the area because of disturbance or because the habitat no longer meets the owl's needs.

In past BOs, we used the management territory to quantify incidental take thresholds for the MSO (see BOs provided to the Forest Service from August 23, 1993 through 1995). The current section 7 consultation guidance provides for incidental take if an activity compromises the integrity of a PAC

through disturbance during the breeding season or habitat alteration. Actions outside PACs will generally not be considered incidental take, except in cases when areas that may support owls have not been adequately surveyed.

Amount or Extent of Take Anticipated

Mexican spotted owl

Using the best available data as summarized within this document, we identified suppression actions which were reasonably certain to have resulted in incidental take of MSOs in the action area. Although it is likely that adverse effects to some of the PACs resulted from the ground ignition/suppression and the wildfire itself, it is the effects of the ignition suppression actions which must be addressed in this emergency consultation. Even though take likely occurred, we recognize the suppression activities as necessary and beneficial as they likely prevented further loss to the species and/or helped to restore key habitat components.

Based on the information provided in the Emergency-Fire Documentation form, the details of suppression actions taken and our analysis, we estimate the following amount or extent of anticipated take resulting from suppression actions for the Chitty Wildfire:

We anticipated take in the form of harm associated with loss of reproduction and/or injury for one pair of MSOs and/or juveniles in the Blue Vista PAC (101304) primarily due to the loss of the nest tree and roosting and foraging habitat within the PAC from fire suppression actions. The anticipated take is in the form of long-term habitat degradation, which is the removal of MSO habitat components to the extent that either feeding, breeding, or sheltering declines over the duration of three to eight breeding seasons.

We anticipated take in the form of harassment, associated with behavior disturbances such as stress, agitation, and/or nest abandonment from smoke and noise occurring during aerial and ground suppression, for nine pairs of MSOs and/or juveniles. For four PACs located nearest to the Chitty Wildfire perimeter, this anticipated take is in the form of short-term disturbance, which is a non-habitat altering action that disrupts or is likely to disrupt owl behavior for one to three breeding seasons: Bear Wallow Shell (101021), Double Cienega (101036), Upper KP (101027), and the Rim (101051). For five PACs that are located within two miles of the Chitty Wildfire perimeter or within the possible flight path, this anticipated take is in the form of a single disturbance, which is a disturbance that occurs within or over one breeding season: Conklin Creek (101003), Slaughter Draw (101005), Bear Wallow Trail 62 (101034), Hagen Creek (101035), and Butterfly (101054).

We do not believe that take occurred for the following eleven PACs based on their location from the Chitty Wildfire perimeter where effects from smoke and noise were likely minimal: Fish Creek (101002), Upper Conklin Creek (101004), Thomas Creek (101013), Willow Creek (101014), Hannagan Creek (101015), Middle Turkey Creek (101018), NW Bear Wallow Confluence (101022), Fish Barrier (101023), Lower KP Creek (101028), Turkey Track (101056), and Foote Creek (101060).

Gila chub

We anticipated that take was reasonable certain to occur to Gila chub in the form of harassment from short-term degradation of water quality and filling in of pool habitats, or other structural changes that limit feeding, breeding, and sheltering opportunities. Thus, incidental take is measured as a surrogate with river miles affected: Gila chub found in 3 miles of upper Eagle Creek were likely harmed by the activities associated with suppression efforts during the Chitty Fire.

Effect of the Take

In this biological opinion, we determine that this level of anticipated take did not likely result in jeopardy to the MSO or result in destruction or adverse modification of MSO critical habitat and did not likely result in jeopardy to the Gila chub or result in destruction or adverse modification of Gila chub critical habitat.

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 ongoing action related to the emergency. The Forest has not advised us of any ongoing actions related to the emergency.

The FWS 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. Sections 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. Sections 668-668d).

DISPOSITION OF DEAD, INJURED, OR SICK MSO

Upon locating a dead, injured, or sick MSO, initial notification must be made to the FWS's Law Enforcement Office, 2450 West Broadway 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 should include the date, time, and location of the animal, a photograph, if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care and in handling specimens to preserve the biological material in the best possible state. If possible, the remains of intact MSO(s) shall be provided to this office. If the remains of the MSO(s) are not intact or are not collected, the information noted above shall be obtained and the carcass left in place. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should the treated MSO(s) survive, the AESO should be contacted regarding the final disposition of the animal.

CONSERVATION RECOMMENDATIONS

Section 7(a) (1) of the Act directs Federal agencies to utilize their authorities to further the purpose 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. We recommend that the following PACs be formally monitored for two years post-fire to better understand the effects of wildfire on MSO and that the results of the monitoring are provided to us: Blue Vista (101304), Bear Wallow Shell (101021), Double Cienega (101036), Upper KP (101027), and the Rim (101051).
2. We recommend that stream bank restoration and channelization improvements be implemented in Chitty Creek and in upper Eagle Creek.
3. We recommend that formal monitoring be conducted in Eagle Creek on the Gila chub and their habitat for two years post-fire to document habitat conditions and the status of the species.

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

REINITIATION - CLOSING STATEMENT

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

We appreciate your consideration of the Mexican spotted owl and Gila chub and their critical habitats. For further information, please contact Kathy Robertson (x232) or Debra Bills (x239). Please refer to consultation number 22410-2007-FE-0338 in future correspondence concerning this project.

Sincerely,

/s/Debra Bills for

Steven L. Spangle
Field Supervisor

cc (hard copy): District Biologist, Clifton Ranger District, Duncan, AZ (Attn: Lance Brown)
District Ranger, Clifton Ranger District, Duncan, AZ (Attn: Jeff Rivera)
District Ranger, Alpine Ranger District, Alpine, AZ
Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ (Attn: Josh Avey)

cc (electronic copy): Wildlife Biologist, Fish and Wildlife Service, Flagstaff, AZ (Attn: Shaula Hedwall)

LITERATURE CITED

- Bond, M.L., R.J. Gutierrez, A.B. Franklin, W.S. LaHaye, C.A. May, and M.E. Seamans. 2002. Short-term effects of wildfires on spotted owl survival, site fidelity, mate fidelity, and reproductive success. *Wildlife Society Bulletin* 30:1022-1028.
- Brown, D.E. 1994. *Biotic communities: southwestern United States and northwestern Mexico*. University of Utah Press, Salt Lake City, Utah. pp. 43-48.
- Courtney, S.J., J.A. Blakesley, R.E. Bigley, M.L. Cody, J.P. Dumbacher, R.C. Fleischer, A.B. Franklin, J.F. Franklin, R.J. Guitierrez, J.M. Marzluff, and L. Sztukowski. 2004. *Scientific Evaluation of the Status of the Northern Spotted Owl*. Sustainable Ecosystems Institute, Portland, Oregon. 508 pp.
- Delaney, D.K., T.G. Grubb, P. Beier, L.L. Pater, M. Hildegard Reiser. 1999. Effects of helicopter noise on Mexican spotted owls. *Journal of Wildlife Management* 63: 60-76.
- DeMarais, B.D. 1986. *Morphological variation in Gila (Pisces, Cyprinidae) and geologic history: Lower Colorado River Basin*. Unpublished M.S. thesis. Arizona State University, Tempe, Arizona.
- Earl, S.R. and D.W. Blinn. 2003. Effects of wildfire ash on water chemistry and biota in southwestern U.S.A. streams. *Freshwater Biology* 48: 1015-1030.
- Fletcher, K. 1990. *Habitat used, abundance, and distribution of the Mexican spotted owl, *Strix occidentalis lucida*, on National Forest System Lands*. U.S. Forest Service, Southwestern Region, Albuquerque, New Mexico. 78 pp.
- Ganey, J. L., G.C. White, A.B. Franklin, J.P. Ward, Jr., and D.C. Bowden. 2000. *A pilot study on monitoring populations of Mexican spotted owls in Arizona and New Mexico: Second interim report*. 41 pp.
- Gutierrez, R.J., C.A. May, M.L. Petersburg, and M.E. Seamans. 2003. *Final Report – Temporal and spatial variation in the demographic rates of two Mexican spotted owl populations*. Contracting Agency U.S. Department of Agriculture, Rocky Mountain Research Station (contract numbers 53-82FT-1-04, 53-82FT-4-07, 43-82FT-9-0152). 146 pp.
- Jenness, J.S. 2000. *The effects of fire on Mexican spotted owls in Arizona and New Mexico*. M.Sc. thesis, Northern Arizona University, Flagstaff, Arizona. 131 p.
- Marsh, P.C., J.E. Brooks, D.A. Hendrickson, and W. L. Minckley. 1990. Fishes of Eagle Creek, Arizona, with records for threatened spikedace and loach minnow (*Cyprinidae*). *Journal of the Arizona-Nevada Academy of Science*. 23: 107-116.
- Marsh, P.C., B.R. Kessner, J.C. Lee, J.D. Schooley, D.J. Thornbrugh, R.W. Clarkson, J.A. Stefferud, and S.E. Stefferud. 2005. *Trip Report, AZ, Greenlee County, Eagle Creek*. 6-10 June 2005.

Marsh, P.C., M.R. Schwemm, B.R. Kessner, A.P. Karam, and J.D. Schooley. 2006. Trip Report, AZ, Greenlee County, Eagle Creek. 12-15 June 2006.

Marsh, P.C., A.P. Karam, J.D. Schooley, M.R. Schwemm, T.E. Dowling, and A.J. Keegan. 2007. Trip Report, AZ, Greenlee County, Eagle Creek. 11-14 June 2007.

Marsh, P.C., J. Barkstedt, G. Ley and M.R. Schwemm. 2008. Trip Report, AZ, Greenlee County, Eagle Creek. 16-19 June 2008.

Miller, R.R. and C.H. Lowe. 1967. Fishes of Arizona, Part 2. In: The vertebrates of Arizona, 2d printing, ed. C.H. Lowe, pp. 133-151. Tucson: University of Arizona Press.

Minckley, W. L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Sims Printing Company, Inc., Phoenix. 293 pp.

National Wildfire Coordination Group (NWCG). 1996. Glossary of Wildland Fire Terminology. First Edition. 141 pp.

Rhodes, J.J. 2007. Watershed impacts of forest treatments to reduce fuels and modify fire behavior. Prepared for: Pacific Rivers Council. Eugene, Oregon.

Rinne, J.N. 1976. Cyprinid fishes of the genus *Gila* from the lower Colorado River basin. *Wasmann Journal of Biology* 34(1): 65-107.

Rinne, J.N. 2004. Forests, fish and fire: relationships and management implications for fishes in the southwestern USA. Pages 151-156 in G.L. Scrimgeour, G. Eisler, B. McCulloch, U.Silins, and M. Monita. Editors. Forest Land-Fish Conference II-Ecosystem Stewardship through Collaboration. Proc. Forest-Land-Fish Conf. II, April 26-28, 2004, Edmonton, Alberta.

Rinne, J.N. and W.L. Minckley. 1970. Native Arizona fishes: Part III - chubs. *Wildlife Views* 17(5): 12-19.

Rosgen, D. 1996. Applied river morphology. *Wildland Hydrology*. Lakewood, CO.

Schmidt, K.M., J.P. Menakis, C.C. Hardy, W.J. Hann, and D.L. Bunnell. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. General Technical Report RMRS-87. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 41 pp.

U.S. Department of the Interior (USDI), Fish and Wildlife Service. 1995. Recovery Plan for the Mexican Spotted Owl. Albuquerque, New Mexico.

U.S. Fish and Wildlife Service (USFWS). 1982. Mexican wolf recovery plan. U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 103 pp.

U.S. Fish and Wildlife Service (USFWS). 1991. Mexican spotted owl status review. Endangered species report 20. Albuquerque, New Mexico.

U.S. Fish and Wildlife Service (USFWS). 1993. Endangered and Threatened Wildlife and Plants; final rule to list the Mexican spotted owl as threatened. Federal Register 58: 14248-14271.

U.S. Fish and Wildlife Service (USFWS). 2002. Endangered and threatened wildlife and plants; listing of the Chiricahua leopard frog (*Rana chiricahuensis*); final rule. Federal Register 67(114): 40790-40811.

U.S. Fish and Wildlife Service (USFWS). 2004. Endangered and threatened wildlife and plants; final designation of critical habitat for the Mexican spotted owl; Final Rule. Federal Register 69(168): 53182-53298

U.S. Fish and Wildlife Service (USFWS). 2005. Endangered and threatened wildlife and plants; listing Gila chub as endangered with critical habitat; Final Rule. Federal Register 70(211): 66664-66721.

U. S. Fish and Wildlife Service (USFWS). 2007. Chiricahua Leopard Frog (*Rana chiricahuensis*) Recovery Plan. U. S. Fish and Wildlife Service, Southwest Region, Albuquerque, NM. 149 pp. + Appendices A-M.

U. S. Forest Service. 2000. Fish survey of upper Eagle Creek. Apache-Sitgreaves National Forest. Alpine Ranger District. 3 pp.

U. S. Forest Service. 2005. Chitty Creek restoration project biological assessment and evaluation. Apache-Sitgreaves National Forest. Clifton Ranger District. 47 pp.

Weedman, D., A.L. Girmendonk, and K. Young. 1996. Status Review of Gila Chub, *Gila intermedia*, in the United States and Mexico. Technical Report 91, Nongame and Endangered Wildlife Program, Arizona Game and Fish Department. 120 pp.

APPENDIX A

Concurrence

Appendix A documents our concurrence with your determination of “may affect, is not likely to adversely affect” for the species listed below.

Chiricahua Leopard Frog (*Lithobates [Rana] chiricahuensis*)

The Chiricahua leopard frog was listed as a threatened species without critical habitat on June 13, 2002 (USFWS 2002) and the recovery plan was completed in April 2007 (USFWS 2007). The last recorded occurrence of Chiricahua leopard frogs in the actions area was in 1988, according to the Arizona Game and Fish Department Heritage Database Management System. This 1988 location was surveyed formally by trained personnel in 2004, and informally in 2003 and no frogs or tadpoles were found. Surveys were completed in 2003 for the length of Chitty Creek, resulting in no detections.

The FWS concurs with your determination that the proposed action may affect, but is not likely to adversely affect the Chiricahua leopard frog for the following reasons:

1. The last recorded occurrence of Chiricahua leopard frogs within the project area is >18 years old.
2. No additional known populations exist within dispersal distance (within one mile over land, three miles along an ephemeral or intermittent drainage, or five miles along a perennial stream) to suitable habitat within the project area or within Sierra Blanca Lake.

Mexican Gray Wolf (*Canis lupus baileyi*)

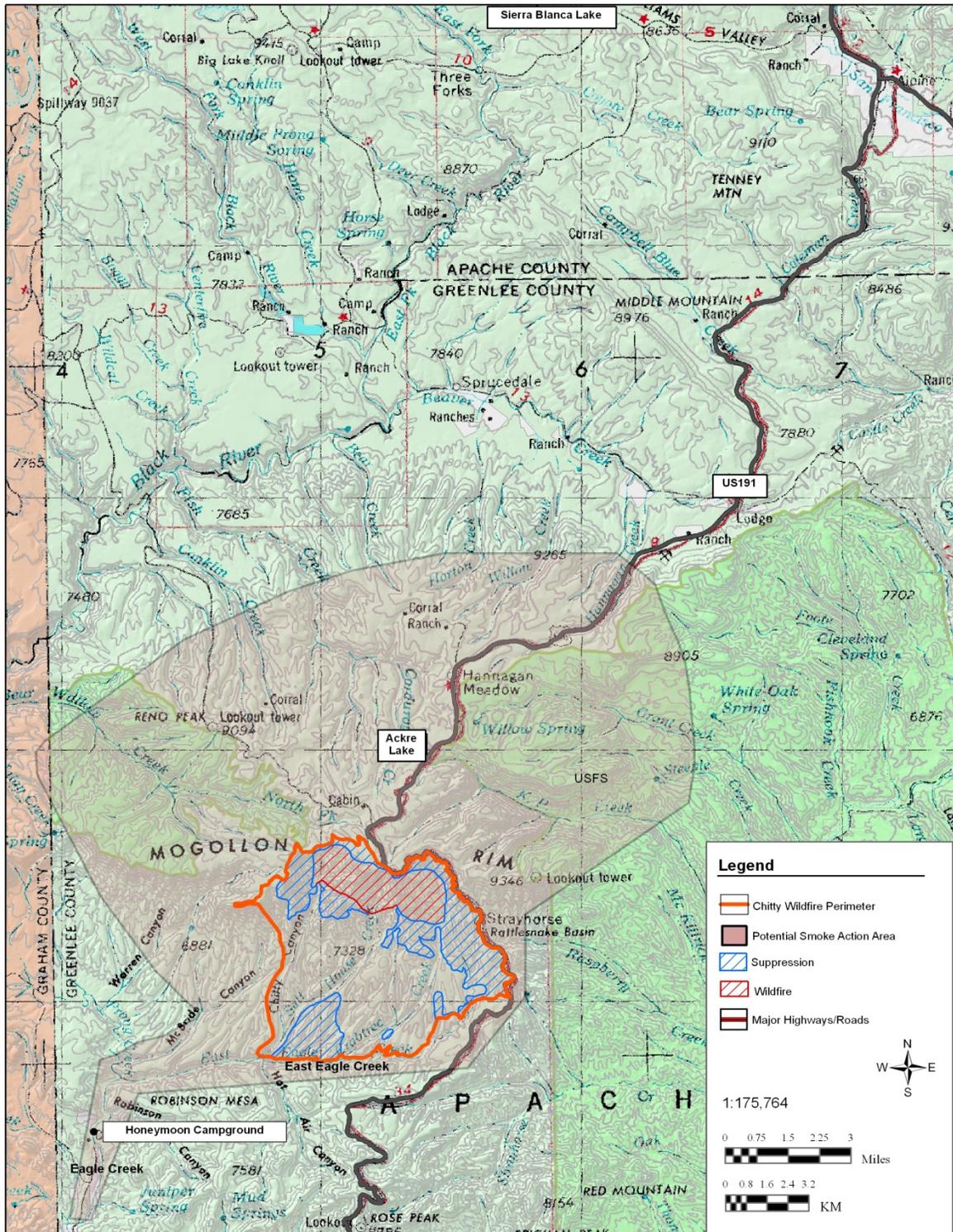
Mexican gray wolves were extirpated from the wild in the U.S. by private and government control campaigns, but were later listed as an endangered species in 1976. A recovery plan (USFWS 1982) was developed by the U.S. Fish and Wildlife Service in 1982 and wolves were reintroduced on the Apache National Forest in March 1998. Wolves have been released from the acclimation pen near Engineer Spring, approximately three miles east of the project area. Several packs (Saddle, Rim, and Bluestem) have been observed denning within and surrounding the action area. The ASNF will be in contact with the FWS personnel and the Arizona Game and Fish personnel working on the wolf recovery team to identify wolf den sites.

Based on information provided in the BAE, we concur with the ASNF determination that the proposed actions “are not likely to jeopardize” the Mexican gray wolf. We base this determination on the following:

1. Because of the wolves’ status as an experimental, non-essential population, wolves found in Arizona are treated as though they are proposed for listing for section 7 consultation purposes. By definition, an experimental non-essential population is not essential to the continued existence of the species. Thus, no proposed action impacting a population so designated could lead to a jeopardy determination for the entire species.

APPENDIX B

Figure 1. General representation of the action area impacted by aerial and ground suppression actions. Flight corridors to and from water drop sites are not depicted in the map.



APPENDIX C**Table 1.** Acres affected by the Chitty Wildfire and suppression activities within the wildfire perimeter.

Intensity	Suppression	Wildfire	Unburned	Total
Crown	121	470		591
High	537	426		963
Moderate	1,528	1,023		2,551
Low	2,640	254		2,894
Unburned			8,067	8,067
Total	4,825	2,174	8,067	15,066

Table 2. Formal and informal monitoring results of Mexican spotted owl protected activity centers in the Alpine Ranger District north of the Chitty Wildfire perimeter.

PAC Name	Survey/Monitoring Records
Fish Creek 101002	1989 1 male observed; 1990-1993 informal monitoring found no response.
Conklin Creek 101003	1990-1993 informal monitoring found no response.
Upper Conklin Creek 101004	1984 1 nestling produced; 1986 2 nestlings produced; 1987-1988 occupancy confirmed; 1989 1 nestling produced; 1991-1992 confirmed occupancy.
Slaughter Draw 101005	1990-1993 informal monitoring found no response.
Thomas Creek 101013	1989 single male observed; 1990 occupancy and pair confirmed but nesting status undetermined; 1991-1992 informal monitoring found no response; 1994 pair located; 2007 single male observed.
Willow Creek 101014	1989 occupancy confirmed but no nestling produced; 1990 single male observed; 1991 occupancy confirmed, no nestling; 1992 occupancy confirmed, nesting undetermined; 1993 occupancy and nest abandonment; 1994 occupancy confirmed, nesting undetermined; 1995 male observed, nesting undetermined.
Hannagan Creek 101015	1985 pair confirmed; 1990-1994 occupancy confirmed; 2007 single male observed; 2008 pair located.
Middle Turkey Spring 101018	1990 occupancy confirmed and 2 nestlings produced; 1991 1 nestling; 1992 2 nestlings produced; 1993 pair located; 1994 single male observed.
Blue Wallow Shell 101021	1990-1991 occupancy confirmed.
NW Bear Wallow Confluence, 101022	1990 occupancy confirmed.
Fish Barrier 101023	1991-1992 2 nestlings produced in both years; 1993 occupancy confirmed.
Upper KP Creek 101027	1985 and 1987 pair located; last monitored in 1993, no response.
Lower KP Creek 101028	1989 pair located, nesting undetermined; 1993 male observed, nesting status undetermined.
Bear Wallow Trail 62 101034	1990 occupancy confirmed; 1991 no response.
Hagen Creek 101035	No survey data available.

Double Cienega 101036	1988 pair located; 1994-1995 absent; 1996-1998 informal monitoring found no response.
Rim 101051	1993 single male detected.
Butterfly 101054	1993 single male detected
Turkey Track 101056	1993 occupancy confirmed but nest status undetermined.
Foote Creek 101060	1994 occupancy confirmed.
Blue Vista 10304	2001 pair observed; 2002 occupancy confirmed, roost sites observed; 2003-2004 pair confirmed; 2005 nestling confirmed.

Table 3. Mexican Spotted Owl protected area centers with the action area that have been affected by wildfires during 2000-2007.

Fire Name	PAC Name	Number of PAC acres burned
Blue Vista	Blue Vista	2.84
KP	Lower KP Creek	568.09
KP	Rim	695.24
Thomas	Hannagan Creek	156.99
Thomas	Foote Creek	652.64
Steeple and KP	Upper KP Creek	640.00
Steeple and KP	Butterfly	662.56
Beaverhead	Hannagan Creek	52.00
Chitty	Blue Vista	695.00

Table 4. Amount of acres and burn intensity from Chitty Wildfire Suppression activities within Gila chub critical habitat.

Intensity	Suppression	Wildfire	Total
Crown	28	178	206
High	231	67	298
Moderate	373	354	718
Low	317	100	417
Total	949	699	1639

Table 5. Suppression and emergency stabilization activities affecting MSO in the Blue Vista PAC. PH=Protected habitat, RH=restricted habitat.

Suppression Actions	Impacts	Type of Disturbance	Habitat Removal
Aerial Ignition	704 acres ignited within RH	Noise during burnout operations adjacent to the PAC	453 acres of crown/high/mod in RH
Aerial Suppression	6,175 gallons of retardant in RH	Noise and possible flush from SEATS, helitankers, and helicopter water drops	277 acres of mod in RH
Ground Ignition	300 acres RH and 281 PH ignited by hand along Highway 191	Noise, smoke, and physical crews along Highway 191	85 acres crown/high in PAC, 277 crown/high/mod in RH
Ground Suppression		Noise and physical crews along Forest Service 54 Road	1.1 mile X 20 ft wide dozer line, 3 mile X 2 feet wide hand line
Ground Rehabilitation	134 acres of cross felling and hand crews in and adjacent to PAC	Noise, possible flush, and cross felling in and adjacent to PAC	

Table 6. Suppression and emergency stabilization activities affecting Gila chub and critical habitat. PH=Protected habitat, RH=restricted habitat

Suppression Actions	Direct Impacts	Sediment/Erosion	Habitat Removal
Aerial Ignition	64 acres of crown/high/mod in watershed.	Potential erosion from high-mod burn in upper East Eagle Creek.	
Ground Ignition	529 acres of crown/high/mod	Potential erosion from high-mod burn in upper East Eagle Creek.	3.1 miles of crown/high/mod in upper East Eagle Creek
Ground Rehabilitation	Cross felling along East Eagle Creek for stream bank stabilization and catch sediment		