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In Reply Refer To:

AESO/SE
02EAAZ00-2012-FE-0190

June 11, 2018

Mr. Neil J. Bosworth, Forest Supervisor
Tonto National Forest
2324 East McDowell Road
Phoenix, Arizona 85006

Dear Mr. Bosworth:

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 initiated on May 14, 2012. Your completed form for emergency fire documentation, which fulfills the requirements necessary for emergency consultation typically provided in a biological assessment and evaluation (BAE), was received in this office on October 31, 2017. At issue are adverse effects to the threatened Mexican spotted owl (*Strix occidentalis lucida*) (hereafter, referred to as Mexican spotted owl, spotted owl, and owl) and its critical habitat as a result of fire suppression and emergency stabilization activities for the Bull Flat Fire, located on the Pleasant Valley Ranger District of the Tonto National Forest (TNF), in Gila County, Arizona. This fire occurred in 2012 but because of workload priorities and the need for more information in the BAE, we are completing the consultation at this time.

This biological opinion is based on information provided in the emergency fire documentation form dated October 31, 2017, telephone conversations, 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

May 10, 2012: The Bull Flat Fire starts because of a lightning strike on the Fort Apache Reservation.

May 14, 2012: The Forest Service initiates emergency consultation on suppression and emergency stabilization actions taken as a result of the fire on National Forest System lands.

June 23, 2012: The Forest Service declared the fire out.

October 28, 2015: We reviewed the BAE and provided comments to the Forest Service.

January 29, 2016: The Forest Service sent an updated draft BAE to our office.

September 28, 2017: We reviewed the BAE and provided comments to the Forest Service.

October 31, 2017: We received a revised BAE from the Forest Service.

May 29, 2018: We sent a draft Biological Opinion to the Forest Service for review.

BIOLOGICAL OPINION

BACKGROUND

On May 10, 2012, the Bull Flat Fire ignited as a result of a lightning strike. The ignition was located on the Fort Apache Reservation. The fire burned a total of 2,145 acres, 578 acres on tribal lands and 1,567 on the TNF. The fire burned a total of 1,134 acres at low severity, 524 acres at moderate severity (high scorch - trees burned may still have some needles) and 25 acres at high severity (scorching all trees - trees completely dead, includes crown fires). A large portion of the area burned at moderate to high severity during the Rodeo-Chediski Fire in 2002. Areas that were not previously burned in the Rodeo-Chediski Fire included 132 acres of mixed conifer and 143 acres of pine-oak habitat.

DESCRIPTION OF THE EMERGENCY ACTION

Suppression and stabilization actions began on May 11, 2012, the fire was contained May 21, 2012, and suppression actions ended June 3, 2012. The fire smoldered until June 23, 2012 when fire managers declared the fire out. Suppression is defined as all the work of extinguishing or confining a fire beginning with its discovery (National Wildfire Coordination Group [NWCG] 2014). Stabilization is defined as planned actions that occur to prevent degradation to natural and cultural resources including the repair, replacement, and construction of physical improvements to prevent this degradation, and minimize threats to life or property as a result of the fire (USFS 1999).

Fire suppression was aggressive given the drought conditions; actions included retardant and water drops, hand lines, dozer lines, and burnout ignitions. In total, the Forest Service suppressed the fire by constructing 4.5 miles of hand lines (fire lines constructed using hand tools) and 5.5 miles of dozer lines (fire lines created by a bull-dozer's front blade), and dropped 17,259 gallons of Phoschek 269F retardant and 48,000 gallons of water. Conservation measures as laid out in the fire retardant Biological Opinion (FWS/AES/DCHRS/035147) were followed and there was no misapplication of fire retardant in water ways. Fourteen retardant drops

occurred from a Single Engine Air Tanker (SEAT) in the Rose and Canyon Lower Mexican spotted owl protected activity centers (PACs) but outside the core areas. Seven SEAT retardant drops occurred in the Lion PAC but were outside the core area. Conditions for the first two days of suppression were not optimal with winds, and the burnout ignitions (ignitions at the inner edge of a fire line to consume fuel) started on the evening of May 13, 2012, along Forest Road (FR) 188. Fire severity from these ignitions varied from high to low and removed ground cover, brush, and smaller trees (less than 9 inches diameter-at-breast height [dbh]). The burnout activities occurred on approximately 121 acres. Burnout ignitions occurred from FR 109 along the SW corner of the Lion PAC, and along FR 188 on the north side of the Rose PAC. At the peak of the fire suppression actions, there were 400 fire personnel, 10 engine units, 3 bull-dozers, and 5 water tenders working the fire. Hazard trees along roads were removed, but it is unknown how many affected trees were removed and how many acres were treated. The fire was declared out on June 23, 2012. After the fire, crews rehabilitated 5.5 miles of bulldozer fire lines created along the PAC boundaries. Information on how they rehabilitated these fire lines was not available.

STATUS OF THE SPECIES

In 1993, the FWS listed the Mexican spotted owl as threatened under the Act. The FWS appointed the Mexican spotted owl Recovery Team in 1993 (USFWS 1993), which produced the Recovery Plan for the Mexican spotted owl in 1995 (USFWS 1995). The FWS released the final Mexican spotted owl Recovery Plan, First Revision (Recovery Plan) in December 2012 (USFWS 2012a). Critical habitat was designated for the spotted owl in 2004 (USFWS 2004).

A detailed account of the taxonomy, biology, and reproductive characteristics of the Mexican spotted owl is found in the Final Rule listing the owl as a threatened species (USFWS 1993), the original Recovery Plan (USFWS 1995), and in the revised Recovery Plan (USFWS 2012a). The information provided in those documents is included herein by reference.

The spotted owl occurs in forested mountains and canyonlands throughout the southwestern United States and Mexico (Gutiérrez et al. 1995). It ranges from Utah, Colorado, Arizona, New Mexico, and the western portions of Texas south into several States of Mexico. Although the owl's entire range covers a broad area of the southwestern United States and Mexico, it does not occur uniformly throughout its range. Instead, the Mexican spotted owl occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyonlands. Known owl locations indicate that the species has an affinity for older, uneven-aged forest, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico.

In addition to this natural variability in habitat influencing owl distribution, human activities also vary across the owl's range. The combination of natural habitat variability, human influences on owls, international boundaries, and logistics of implementation of the Recovery Plan necessitates subdivision of the owl's range into smaller management areas. The 1995 Recovery Plan subdivided the owl's range into 11 "Recovery Units" (RUs): six in the United States and five in Mexico. In the revision of the Recovery Plan, we renamed RUs as "Ecological Management Units" (EMUs) to be in accord with current FWS guidelines. We divide the Mexican spotted

owl's range within the United States into five EMUs: Colorado Plateau (CP), Southern Rocky Mountains (SRM), Upper Gila Mountains (UGM), Basin and Range-West (BRW), and Basin and Range-East (BRE) (Appendix A, Figure 2). Within Mexico, the Revised Recovery Plan delineated five EMUs: Sierra Madre Occidental Norte, Sierra Madre Occidental Sur, Sierra Madre Oriental Norte, Sierra Madre Oriental Sur, and Eje Neovolcanico.

Mexican spotted owl surveys since the 1995 Recovery Plan have increased our knowledge of owl distribution, but not necessarily of owl abundance. Population estimates, based upon owl surveys, recorded 758 owl sites from 1990 to 1993, and 1,222 owl sites from 1990 to 2004 in the United States. The Recovery Plan (USFWS 2012) lists 1,324 known owl sites in the United States. An owl site is an area used by a single or a pair of adult or subadult owls for nesting, roosting, or foraging. The increase in number of known owl sites is mainly a product of new owl surveys being completed within previously unsurveyed areas (e.g., several National Parks within southern Utah, Grand Canyon National Park in Arizona, Guadalupe National Park in West Texas, Guadalupe Mountains in southeastern New Mexico and West Texas, Dinosaur National Monument in Colorado, Cibola National Forest [NF] in New Mexico, and Gila NF in New Mexico). Thus, an increase in abundance in the species range-wide cannot be inferred from these data (USFWS 2012). However, we do assume that an increase in the number of areas considered to be occupied is a positive indicator regarding owl abundance.

We are currently working with the Southwestern Region of the Forest Service to conduct a pilot study for the population monitoring recommended in the Revised Recovery Plan (USFWS 2012). The effort to conduct this work occurred during the 2014 breeding season and has continued into the 2015 breeding season, but only on National Forest System (NFS) lands. The Recovery Team, Forest Service, and the Rocky Mountain Bird Observatory (RMBO, contractor) are continuing to collect data and develop a strategy for incorporating additional lands (e.g., National Park Service, Bureau of Land Management, Department of Defense) into the monitoring. Currently, based on the work conducted by the Forest Service and RMBO, we have a process for conducting range-wide population monitoring, but we need to further develop the potential strategy for collecting range-wide habitat monitoring data.

Two primary reasons were cited for the original listing of the Mexican spotted owl in 1993: (1) the historical alteration of its habitat as the result of timber-management practices; and, (2) the threat of these practices continuing. The danger of stand-replacing fire was also cited as a looming threat at that time. Since publication of the original Recovery Plan (USFWS 1995), we have acquired new information on the biology, threats, and habitat needs of the Mexican spotted owl. Threats to its population in the U.S. (but likely not in Mexico) have transitioned from commercial-based timber harvest to the risk of stand-replacing wildland fire (USFWS 2012a). Recent forest management has moved away from a commodity focus and now emphasizes sustainable ecological function and a return toward pre-settlement fire regimes, both of which have potential to benefit the spotted owl. However, as stated in the revised Recovery Plan (USFWS 2012), there is much uncertainty regarding thinning and burning treatment effects and the risks to owl habitat with or without forest treatment as well. Therefore, efforts to reduce fire risk to owls should be designed and implemented to evaluate the effects of treatments on owls and retention of or movement towards desired conditions.

Southwestern forests have experienced larger and more severe wildland fires from 1995 to the present, than prior to 1995. Climate variability combined with unhealthy forest conditions may also synergistically result in increased negative effects to habitat from fire. The intensification of natural drought cycles and the ensuing stress placed upon overstocked forested habitats could result in even larger and more severe fires in owl habitat. Several fatality factors have been identified as particularly detrimental to the Mexican spotted owl, including predation, starvation, accidents, disease, and parasites.

Historical and current anthropogenic uses of Mexican spotted owl 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 owl nesting, roosting, and foraging habitat, and may cause disturbance during the breeding season. Livestock and wild ungulate grazing is prevalent throughout the range of the owl and is thought to have a negative effect on the availability of grass cover for prey species. Recreation impacts are increasing throughout the Southwest, especially in meadow and riparian areas. There is anecdotal information and research that indicates that owls in heavily used recreation areas are much more erratic in their movement patterns and behavior. Fuels reduction treatments, though critical to reducing the risk of severe wildland fire, can have short-term adverse effects to owls through habitat modification and disturbance. As the human population grows in the southwestern United States, small communities within and adjacent to wildlands are being developed. This trend may have detrimental effects to spotted owls by further fragmenting habitat and increasing disturbance during the breeding season.

Several fatality factors have been identified as particularly detrimental to the Mexican spotted owl, including predation, starvation, accidents, disease, and parasites. For example, West Nile Virus also has the potential to adversely impact the Mexican spotted owl. 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 spotted 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 the owl range-wide.

Currently, high-severity, stand-replacing fires are influencing ponderosa pine and mixed conifer forest types in Arizona and New Mexico. Uncharacteristic wildland fire is probably the greatest threat to the Mexican spotted owl within the action area. As throughout the West, fire severity and size have been increasing within this geographic area. Landscape level wildland fires, such as the Rodeo-Chediski Fire (2002), the Wallow Fire (2011), and the Whitewater-Baldy Complex (2012) have resulted in the loss of tens of thousands of acres of occupied and potential nest/roost habitat across significant portions of the Mexican spotted owl's range.

Finally, global climate variability may also be a threat to the owl. Changing climate conditions may interact with fire, management actions, and other factors discussed above, to increase impacts to owl habitat. Studies have shown that since 1950, the snowmelt season in some watersheds of the western U.S. has advanced by about 10 days (Dettinger and Cayan 1995, Dettinger and Diaz 2000, Stewart et al. 2004). Such changes in the timing and amount of snowmelt are thought to be signals of climate-related change in high elevations (Smith et al.

2000, Reiners et al. 2003). The impact of climate change is the intensification of natural drought cycles and the ensuing stress placed upon high-elevation montane habitats (IPCC 2007, Cook et al. 2004, Breshears et al. 2005, Mueller et al. 2005). The increased stress put on these habitats is likely to result in long-term changes to vegetation, and to invertebrate and vertebrate populations within coniferous forests and canyon habitats that affect ecosystem function and processes.

Critical habitat

The FWS designated critical habitat for the Mexican spotted owl in 2004 on approximately 8.6 million acres (3.5 million hectares) of Federal lands in Arizona, Colorado, New Mexico, and Utah (USFWS 2004). Designated critical habitat boundaries include only areas defined as protected habitat (defined as PACs and unoccupied slopes >40 percent in the mixed conifer and pine-oak forest types that have not had timber harvest in the last 20 years) and restricted (now called “recovery”) habitat (unoccupied owl foraging, dispersal, and future nest/roost habitat) (USFWS 1995).

The Mexican spotted owl critical habitat Primary Constituent Elements (PCEs) were determined from studies of their habitat requirements and information provided in the Recovery Plan (USFWS 1995). Since owl habitat can include both canyon and forested areas, PCEs were identified in both areas. The PCEs identified for the owl within mixed-conifer, pine-oak, and riparian forest types that provide for one or more of the owl’s habitat needs for nesting, roosting, foraging, and dispersing are:

- A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 to 45 percent of which are large trees with dbh (4.5 ft above ground) of 12 inches or more;
- A shade canopy created by the tree branches covering 40 percent or more of the ground;
- Large, dead trees (snags) with a dbh of at least 12 inches.
- 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 PCEs are typically 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 PCEs 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.

Steep-walled rocky canyonlands occur typically within the Colorado Plateau EMU, but also occur in other EMUs. Canyon habitat is used by owls for nesting, roosting, and foraging, and includes landscapes dominated by vertical-walled rocky cliffs within complex watersheds, including many tributary side canyons. These areas typically include parallel-walled canyons up to 1.2 miles (2 kilometers) in width (from rim to rim), with canyon reaches often 1.2 miles (2 kilometers) or greater, and with cool north-facing aspects. The PCEs related to canyon habitat include one or more of the following:

- Presence of water (often providing cooler and often higher humidity than the surrounding areas);
- Clumps or stringers of mixed-conifer, pine-oak, piñon-juniper, and/or riparian vegetation;
- Canyon walls containing crevices, ledges, or caves; and,
- High percent of ground litter and woody debris.

Overall, the status of the owl and its designated critical habitat has not changed significantly range-wide in the U.S. (which includes Utah, Colorado, Arizona, New Mexico, and extreme southwestern Texas); based upon the information we have, since issuance of the 2012 LRMP BOs for the National Forests in the Southwestern Region of the Forest Service (i.e., see USFWS 2012b). What we mean by this is that the distribution of owls continues to cover the same area, and critical habitat is continuing to provide for the life history needs of the Mexican spotted owl throughout all of the EMUs located in the U.S. We do not have detailed information regarding the status of the Mexican spotted owl in Mexico, so we cannot make inferences regarding its overall status.

However, this is not to say that significant changes have not occurred within the owl's U.S. range. Wildland fire has resulted in the greatest loss of PACs and critical habitat relative to other actions (e.g., such as forest management, livestock grazing, recreation, etc.) throughout the U.S. range of the Mexican spotted owl. These wildland fire impacts have mainly impacted Mexican spotted owls within the UGM EMU (e.g., Slide and Schultz Fires on the Coconino NF, Rodeo-Chediski and Wallow Fires on the Apache-Sitgreaves NF and Whitewater-Baldy Complex on the Gila NF) and BRW EMU (e.g., Horseshoe 2 Fire on the Coronado NF); but other EMUs have been impacted as well (SRM EMU, the Santa Fe NF by the Las Conchas Fire, CP EMU by the Warm Fire). However, we do not know the extent of the effects of these wildland fires on actual owl numbers.

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 action in the 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 action area is in the TNF, which is located within the Upper Gila Mountain (UGM) and the Basin and Range-West (BRW) EMUs for the Mexican spotted owl. The Bull Flat Fire itself occurred in the UGM EMU and included four PACs; the fire and suppression actions affected each PAC at different intensities. The Lower Valentine, Lower Canyon, Lion and Rose PACs are all located within the Bull Flat Fire area, and 1,792 acres of the area is designated critical habitat (which includes protected and recovery habitats) for the Mexican spotted owl.

Status of the species within the action area***Mexican Spotted Owl***

Four Mexican spotted owl PACs (Lion, Lower Valentine, Lower Canyon, and Rose) occur within the Bull Flat fire action area. There is no occupancy data for these PACs since the Bull Flat Fire. However, following the 2002 Rodeo-Chediski Fire, surveys in 2007 found a male in Lower Canyon PAC; a single owl (sex unknown) in the Lion PAC; and a pair in the Rose PAC. Surveys in 2005 and 2009 detected a pair in the Lion PAC and a single male was detected in 2007. There was no information for the Lower Valentine PAC from 2003-2009 and 2012, and no recorded responses in 2010 or 2011. Therefore, even with the past effects to owl habitat from the Rodeo-Chediski Fire, three breeding sites (Lion, Lower Canyon, and Rose PACs) have continued to be occupied, and we expect that owls occupied these areas during the Bull Flat Fire.

Mexican Spotted Owl Protected, Recovery, and Critical Habitat

Prior to the Bull Flat fire, there was no recent habitat description for Mexican spotted owl protected, recovery, or critical habitat within the action area. Prior to the 2002 Rodeo Chediski fire, the Forest Service's early 1990's stand description identified approximately 132 acres of mixed conifer habitat and 143 acres of pine-oak habitat within the 1,567 acre Bull Flat fire perimeter. As a result, the vegetation type for about 1,300 acres within the entire Bull Flat fire perimeter was not described. Despite the Rodeo-Chediski fire, spatially distributed pine-oak and mixed-conifer vegetation, snags, dead and downed trees, developing shrub understory, and canopy cover (spotted owl critical habitat and recovery habitat components) persisted across PACs to provide owl breeding habitat (based upon positive survey results in 2005, 2007, and 2009).

Factors affecting the species' environment within the action area

Formal consultation has been initiated for various projects within the action area including a reinitiation for the Land and Resource Management Plan, allotment management plans, and the Rodeo-Chediski salvage logging project. All these consultations were non-jeopardy and non-adverse modification of critical habitat for the Mexican spotted owl. There were adverse impacts to some PCEs like removal of understory vegetation for utility corridors. Recreation such as camping, hiking, and hunting occurs in the action area, and the use and development of private land, and actions on the Fort Apache Reservation also occur within the vicinity of the area.

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 with 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.

Effects to the Mexican Spotted Owl and its Habitat

The Bull Flat fire suppression and rehabilitation actions occurred within four PACs during a time of the breeding season (May through June) when breeding Mexican spotted owls would be susceptible to effects from fire management activities (Table 1). Despite habitat loss from the 2002 Rodeo-Chediski, fire, spatially distributed pine-oak and mixed-conifer vegetation and canopy cover remained within PACs and were used by three pairs of breeding owls in 2005, 2007, and 2009. We therefore anticipate owls were likely present and nesting within these same three PACs (Lion, Lower Canyon, and Rose) prior to the 2012 Bull Flat fire. Because we expect spotted owls to have nestlings in May and fledglings in early June, which coincides with the Bull Flat fire, these breeding owls and nestlings were vulnerable to the adverse effects of fire suppression and habitat rehabilitation (smoke, disturbance, noise, retardant and water drops, etc.).

Table 1. Bull Flat fire suppression activities in four Mexican spotted owl PACs.

PAC	Aerial Actions	Ground Ignitions	Ground Suppression	Rehabilitation
Lower Valentine PAC	No aerial flights occurred over PAC.	Burnout occurred along PAC boundary. Burnout fire effects moderate to low inside PAC.	0.5 mile dozer line in PAC, 0.75 mile in core area. Significant noise disturbance.	0.75 mile bulldozer fire line rehabilitation along PAC. Moderate disturbance.
Lower Canyon PAC	Multiple aerial flights occurred in area of PAC over 7 days. Partial retardant drop.	Minimal effect of noise and smoke. No suppression fire operations in the PAC.	1 mile dozer line in PAC, 0.25 mile in core area. Significant noise disturbance.	1 mile bulldozer fire line rehabilitation in PAC, 0.25 mile in core area. Significant noise disturbance.
Lion PAC	Multiple aerial flights occurred in area of PAC over 7 days. Partial retardant drop.	Burnout occurred along PAC boundary (FR 109). Burnout moderate to low inside PAC.	1 mile dozer line in PAC near core area. Significant noise disturbance.	1 mile bulldozer fire line rehabilitation inside the PAC and near the core area. Significant noise disturbance.
Rose PAC	Multiple aerial flights occurred in area of PAC over 7 days. Partial retardant drop.	Burnout occurred along PAC boundary (FR 188). Burnout moderate to low inside PAC	2 miles dozer line on PAC boundary. Significant noise disturbance.	2 miles bulldozer fire line rehabilitation along PAC boundary. Significant noise disturbance.

The Bull Flat fire suppression actions had varying habitat, noise, retardant/water, and smoke impacts within the Lower Valentine, Rose, and Lion PACs (Table 1). These actions occurred during the 10-day period between May 11 and May 21 while breeding owls were tending

nestlings. There were fourteen retardant drops in the Rose and Lower Canyon PACs, and seven retardant drops in the Lion PAC. While no retardant drops occurred in any core area, there was likely a measurable increase in noise disturbance and possibility of retardant drift into the core areas. Burnout operations led to dozers creating 0.5 mile of fire line within the Lower Valentine PAC and an additional 0.75 mile of fire line within the owl's core nest area during suppression activities. The Rose PAC experienced high levels of fixed-wing and helicopter flights over a 7-day period. In addition, burnout operations occurred along and within the Rose PAC along with 2 miles of fire line construction on the PAC boundary. The TNF was unable to distinguish acreage affected by the burnout operations and wildfire beyond the estimated 121 acres where they conducted burnout operations and constructed hand lines.

Bull Flat fire suppression activities (bulldozers, aerial flights, water and retardant drops, burnouts, hand lines/dozer lines, and chainsaw use) adjacent to and within PACs created noise disturbance that likely adversely affected breeding spotted owls and their nestlings. Extended bulldozer activity in close proximity to owls can create over 60 decibels of noise (Delaney et al. 1999) and along with disturbance from smoke, planes/helicopters and retardant/water drops likely caused owls to flush from perches/roosts, which may have caused reduced foraging, nest attendance, and feeding of nestlings. These effects would subsequently increase the owls and their nestlings' vulnerability to predators, stress, starvation, injury, and death (USFWS 2012).

We do not anticipate that any water or retardant drops, or other suppression/rehabilitation activities caused direct impacts to spotted owls. Due the mobility of adult owls and the location of nestlings in trees, it is not likely any aerial activity or ground actions came into direct contact with spotted owls and caused injury or death. While nestlings are immobile and especially vulnerable to injury or death from direct water or retardant drops, all drops occurred outside of the nest core areas. Therefore, we expect there were no direct effects to spotted owls from suppression/rehabilitation actions.

Post-fire, the TNF also conducted rehabilitation actions within/adjacent to PACs during the breeding season. Although these actions are anticipated to reduce long-term effects to the owl and its habitat and assist in habitat recovery, bulldozers and line rehabilitation activities likely resulted in continuing adverse effects to breeding Mexican spotted owls and their nestlings similar to the noise disturbances generated from suppression activities. Rehabilitation work within each PAC included the following actions:

- *Lower Valentine PAC*: 1.25 miles of bulldozer fire line rehabilitation along the PAC boundary.
- *Rose PAC*: 2 miles of bulldozer fire line rehabilitation along the PAC boundary.
- *Lower Canyon PAC*: 1.25 miles of bulldozer fire rehabilitation along the PAC boundary.
- *Lion PAC*: 1 mile of bulldozer fire line rehabilitation along the PAC boundary.

Overall, we anticipate the Bull Flat fire rehabilitation/suppression efforts resulted in temporal adverse effects to spotted owl protected and recovery habitat, but implementing these efforts likely prevented greater impacts to spotted owl habitat. The Bull Flat fire affected 1,792 acres of Mexican spotted owl recovery, protected, and critical habitat; of which 1,435 acres were burned and 357 acres were unburned/underburned. The variety of suppression/rehabilitation actions

affected an estimated 13 acres of protected habitat and 125 acres of recovery habitat (Table 2). Because these suppression and rehabilitation efforts were spread across three different PACs with habitat alteration occurring within PACs and also along PAC perimeters, it resulted in some changes to essential spotted owl protected and recovery habitat. It is uncertain due to the complications caused by the overall larger impact of the Bull Flat fire whether these suppression/rehabilitation efforts will influence future owl occupancy or their breeding success. However, the impact to 125 acres of owl recovery and 13 acres of protected habitat (while minimizing the overall impact of the fire), will result in adverse effects to overall spotted owl recovery efforts.

Table 2. Suppression actions affecting Mexican spotted owl protected, recovery, and designated critical habitat.

Suppression Actions	Protected	Recovery	Critical Habitat
Dozerline	5.5 miles/12.7 acres	1.5 miles/3.6 acres	1.5 miles/3.6 acres
Handline	1 mile/0.36 acres	1 mile/ 0.4 acres	1 mile/0.4 acres
Burnout	1 mile/121 acres	1 mile/121 acres	1 mile/ 121 acres
Road Hazard Tree Removal	Unknown	Unknown	Unknown
Total Acres of Habitat Impacted	13 acres	125 acres	125 acres

Effects to the Mexican Spotted Owl Critical Habitat

Ground based suppression and rehabilitation activities occurring within Mexican spotted owl designated critical habitat resulted in adverse effects. Similar to the discussion above, these adverse effects likely prevented further impacts from fire and assisted in habitat recovery. Within critical habitat, approximately 121 acres were affected by burnout actions, 0.4 acre affected by hand line construction, and 3.6 acres affected by dozer line construction (approximately 125 acres total). There were a total of 21 retardant drops in critical habitat. It is difficult to separate the effects from the retardant drops to PCEs from the effects of the fire.

We expect that spotted owl critical habitat PCEs associated with forest structure and prey species maintenance were adversely affected by Bull Flat fire suppression/rehabilitation activities. The following list summarizes how suppression and rehabilitation actions affected spotted owl critical habitat PCEs.

Primary Constituent Element 1: Forest structure

- A. A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 to 45 percent of which are large trees with dbh (4.5 ft above ground) of 12 inches or more.
Effect: The 2002 Rodeo Chediski fire reduced this PCE in the action area, but it is unknown how much of this PCE remained after the fire. However, because three spotted owl pairs occupied PACs (2005, 2007, and 2009) following Rodeo Chediski, this PCE was present. The Bull Flat fire suppression/rehabilitation efforts, through activities like burnout ignitions, adversely affected the range of tree species and sizes across the 125 suppression action acres, but also prevented further impacts from occurring.

- B. A shade canopy created by the tree branches covering 40 percent or more of the ground.
Effect: The 2002 Rodeo Chediski fire reduced shade canopy in the action area, but it is unknown exactly how much of this PCE remained to support the three spotted owl pairs that occupied PACs in 2005, 2007, and 2009. The Bull Flat fire suppression/rehabilitation efforts adversely affected overall shade canopy across 125 acres through burnout ignitions and retardant drops, but also prevented further impacts from occurring.
- C. Large, dead trees (snags) with a dbh of at least 12 inches.
Effect: Non-fire created snags were limited within the Bull Flat fire perimeter because of the 2002 Rodeo Chediski fire. Bull Flat fire suppression and rehabilitation actions removed snags by chainsaws and burnout ignitions (number and sizes are unknown) across 125 acres further reducing and adversely affecting this limited PCE.

Primary Constituent Element 2: Canyon Habitat

- A. Presence of water (often providing cooler and often higher humidity than the surrounding areas).
Effect: Flowing water is still present and flowing in the canyon on the east side of the Bull Flat fire. We expect there was no effect to this PCE because no fire suppression actions or rehabilitation actions affected perennial water.
- B. Clumps or stringers of mixed-conifer, pine-oak, piñon-juniper, and/or riparian vegetation.
Effect: Burnout suppression actions resulted in low intensity fire within riparian areas and other vegetation types within canyons, resulting in insignificant effects.
- C. Canyon walls containing crevices, ledges, or caves.
Effect: The burnout operations conducted at the east end of the canyon burned at low intensity resulting in insignificant effects to canyon walls.
- D. High percent of ground litter and woody debris.
Effect: The burnout operations resulted in low intensity fire resulting in insignificant effects to ground litter and woody debris.

Primary Constituent Element 3: Maintenance of adequate prey species

- A. High volumes of fallen trees and other woody debris.
Effect: High volumes of fallen trees and other woody debris were abundant due to the Rodeo Chediski fire. The moderate severity burnout from suppression activities across 125 acres likely caused an adverse effect by reducing the volume of fallen trees and woody debris for prey species (USFS 2017).
- B. A wide range of tree and plant species, including hardwoods.
Effect: The 2002 Rodeo Chediski fire reduced the previously wide range of tree and plants species. While it is unknown how much was affected (USFS 2017), this PCE was present enough to support prey species for three spotted owl pairs. The Bull Flat fire

suppression activities likely further reduced the wide range of these plant species through burnout and retardant drops causing an adverse effect.

- C. Adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration.

Effect: Moderate severity burnout ignitions along FR 188 and FR 109 and bulldozer lines reduced residual plant cover for prey species. While residual plant cover will likely return the following future growing seasons, suppression activities caused a temporal short-term adverse effect across 125 acres.

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.

The land within the project boundary is primarily of Federal ownership. Unmanaged/dispersed recreation is the primary non-Federal activity that occurs in the project area. Recreation may result in disturbance effects to Mexican spotted owls. The extent of such disturbance is unknown, but it is expected to be relatively minor.

CONCLUSION

After reviewing the current status of the Mexican spotted owl and its designated critical habitat, the environmental baseline for the action area, the effects of the proposed action, and cumulative effects, it is the FWS's biological opinion that the suppression and rehabilitation activities taken during the Bull Flat fire on the TNF did not jeopardize the Mexican spotted owl or destroy or adversely modify its critical habitat. We present these conclusions for the following reasons:

Fire suppression/rehabilitation disturbed owls and indirectly affected three of the 688 owl sites within the UGM EMU (USFWS 2012). While the Bull Flat fire suppression/rehabilitation efforts contributed to adversely affecting spotted owls, it also prevented further adverse effects to owls and its habitat. Therefore, due to the few spotted owl PACs affected and the prevention of further adverse effects, Bull Flat fire suppression and rehabilitation actions did not jeopardize the Mexican spotted owl.

1. Bull Flat fire suppression and rehabilitation temporarily impacted spotted owl protected and recovery habitat, but prevented further wildfire impacts and did not jeopardize the spotted owl. The impacts to spotted owl habitat were minimized across 125 acres, are temporal in nature, and the ecosystem retains the function for spotted owl habitat to recover within the UGM EMU.
2. Emergency Bull Flat fire suppression (125 acres) and rehabilitation activities (5.5 miles of bulldozer lines) did not remove the recovery potential or adversely modify Mexican spotted owl critical habitat in the UGM CHU. The forest structure, canyon habitat, and

prey species PCEs, while reduced, still occur. The ecosystem function persists for these spotted owl PCEs to recover within the UGM CHU.

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

INCIDENTAL TAKE STATEMENT

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

AMOUNT OR EXTENT OF TAKE

We anticipate that the Bull Flat Fire emergency suppression and rehabilitation activities resulted in the incidental take of Mexican spotted owls associated with the Lower Canyon, Lion and Rose PACs during the 2012 breeding season due to harassment.

Fire suppression and rehabilitation activities disturbances by ground and aerial activities (i.e., construction of handlines/dozerlines, chainsaw use, burnout operations, flyovers, and retardant drops) occurred at and within these three spotted owl PACs during the 10-day period between May 11 and May 21 when nestlings were immobile and reliant on breeding adults for food. These activities likely harassed adult spotted owls by reducing their foraging time and feeding of nestlings, thereby increasing the time nestlings were without food and exposed to starvation and predation, leading to death. Overall, we believe it is likely that Bull Flat emergency fire suppression and rehabilitation actions caused incidental take due to short-term (single breeding season) harassment to all Mexican spotted owl adults (up to 6 owls) that led to the death of any nestling owls associated with the Lower Canyon, Lion, and Rose PACs in 2012.

EFFECT OF THE TAKE

In this biological opinion, we determine that this level of anticipated take is not likely to result in jeopardy of the species or destruction or adverse modification of critical habitat for the reasons stated in the Conclusions section.

REASONABLE AND PRUDENT MEASURES

No reasonable and prudent measures are necessary for the emergency action addressed in this biological opinion because the action was an emergency response and was completed prior to consultation.

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.

This biological opinion addresses only the suppression and rehabilitation actions that were taken for the Bull Flat Fire.

1. We recommend that the Forest Service continue to work with us to design forest restoration treatments across the TNF that protect Mexican spotted owl habitat from high-severity fire.
2. We recommend that the Forest Service continue to assist us in the Implementation of the Mexican Spotted Owl Recovery Plan, First Revision.

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

REINITIATION NOTICE

This concludes formal consultation on the action outlined in your request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required when 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.

In keeping with our trust responsibilities to American Indian Tribes, we encourage you to continue to coordinate with the Bureau of Indian Affairs (BIA) in the implementation of this consultation and, by copy of this biological opinion, are notifying the Tonto Apache Tribe and the BIA of its completion. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

We appreciate your consideration of the Mexican spotted owl. For further information, please contact Nichole Engelmann or Greg Beatty (602-242-0210). Please refer to consultation number 22410-2012-FE-0190 in future correspondence concerning this project.

Sincerely,

Acting Field Supervisor

cc.:

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Forest Service, Tonto National Forest, Phoenix, AZ (Attn: Brian Peterson)

District Ranger, Pleasant Valley Ranger District, Tonto National Forest, Young, AZ

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

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Director, Environmental Protection Department, Tonto Apache Tribe, Payson, AZ (Attn: Joe Morgan)

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