

United States Department of the Interior

U.S. Fish and Wildlife Service

Arizona Ecological Services Office

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In Reply Refer To:
AESO/SE
22410-2011-FE-0477

June 21, 2013

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 August 24, 2011. 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 March 6, 2013. At issue are impacts that were associated with fire suppression and emergency stabilization activities for the Frio Fire, located on the Globe Ranger District of the Tonto National Forest (TNF), in Gila County, Arizona.

You determined that suppression and emergency stabilization “likely adversely affected” the endangered Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*). You also requested our concurrence with your conclusion of “may affect, not likely to adversely affect” the threatened Mexican spotted owl (*Strix occidentalis lucida*) and its critical habitat. We concur with these determinations and provide our reasoning in Appendix A.

This biological opinion is based on information provided in the emergency fire documentation form dated March 4, 2013, 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.

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Consultation History

- August 17, 2011: A lightning strike occurred in the TNF, igniting the Frio Fire.
- August 24, 2011: We received notice that suppression and emergency stabilization actions were occurring to control the Frio Fire, and initiated emergency consultation.
- March 2013: Informal discussions between staff regarding the consultation.
- March 6, 2013: We received a final emergency fire documentation form and a March 4, 2013, letter from the TNF requesting initiation of formal section 7 consultation.
- March 14, 2013: We sent a letter in response to the TNF's request for formal consultation.
- May 16, 2013: We sent a draft Biological Opinion to the TNF.
- May 30, 2013: Comments on the draft Biological Opinion were received.

BIOLOGICAL OPINION

BACKGROUND

The Frio Wildfire was started on August 17, 2011, from a lightning strike on the TNF, Globe Ranger District, near Globe, Arizona. Weather during the fire and suppression activities was normal, with no high winds documented. The wildfire burned a total of 3,966 acres, of which 128 acres were severely burned, 559 acres were moderately burned, and 1,122 acres burned at a low intensity. The remaining 2,154 acres were described as being unburned/underburned. Moderate-severity burn is defined as high scorch (trees burned may still have some needles), and high-severity burn is defined as completely scorching all trees (trees completely dead), high severity burns include crown fires.

DESCRIPTION OF THE EMERGENCY ACTION

Suppression and stabilization actions began on August 18, 2011, and ended on October 15, 2011. Suppression is defined as all the work of extinguishing or confining a fire beginning with its discovery (National Wildfire Coordination Group [NWCG] 2012). 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).

Management actions associated with the fire suppression included hand lines, dozer lines, chainsaws, and backfiring. A fire line is a control line that is dug to mineral soil. Hand lines are defined as fire lines that are constructed using hand tools. Dozer lines are fire lines created by the front blade of a dozer. Backfiring is the ignition of the inner edge of the fire line to consume

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fuel (NWCG 2012). A hand line was constructed around nine power poles from Madera Peak, and went north towards the city of Miami, impacting less than one acre of the TNF. A dozer line reinforced one mile of existing firebreak, and impacted approximately three acres around Forest Road (FR) 2568A. Chainsaws were used to remove hazard trees near roadways during the week of peak fire activity. Ground ignitions were completed along a road at the top of Madera ridgeline, and where there was the potential for the fire to make an ‘uphill run.’ This was done to protect over story vegetation. The ground ignitions created an under burn at high burn severity that removed ground cover, brush, and smaller trees (less than nine inches in diameter). These ground ignitions are a form of back burning, and removed fuels in narrow strips along FR 580 and FR 651. Smaller segments were completed in the southeastern portion of the fire perimeter, and within 0.4 mile of FR 580. One backfire line was constructed through potential Arizona hedgehog cactus habitat. Effects of the back burning were minimal, and burned approximately 79.3 acres. No water drops, chemical application, or heavy tankers were used.

STATUS OF THE SPECIES

The Arizona hedgehog cactus was listed as endangered without critical habitat in 1979 (USFWS 1979). No recovery plan has been established for this cactus. A technical review of the Arizona hedgehog cactus recovery was drafted in 1984 by the Southwest Region 3 of the Forest Service, but never finalized. Its purpose was to propose reasonable actions which the Forest Service deemed necessary for the recovery of the species. The cactus is protected by the Arizona Native Plant Law (A.R.S. Chapter 7, Article 1) as a Highly Safeguarded Native Plant and protected from international trade by the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The Arizona hedgehog cactus is a succulent, perennial plant with diploid, perfect-flowers. Distinguishing characteristics of the cactus include its thick stems and smooth spines, with a dark green cylindroid stem between 2.5 and 12 inches (6.4-30.5 cm). Stems occur singly or in clusters, with one to three gray or pinkish central spines and five to eleven shorter radial spines that are less than 0.5 inch in length (Baker 2006). The most distinguishing feature of this taxon in comparing it to other varieties and species of *E. triglochidiatus* is its robustness; the stems are wider and generally taller (USFWS 1985). The cactus is an obligate out-crosser that is pollinated by hummingbirds, carpenter bees, solitary bees, and honeybees (USFS 2004). It produces bright red flowers along the side of the stem in late April to May, and fruits from May to June (AGFD 2003). About 100 seeds are produced per fruit (AGFD 2003) and mature cacti can produce many fruits per year. Recent morphological work by Baker (2006) recommends that this taxon be placed within *E. arizonicus* (*E. arizonicus* ssp. *arizonicus*), rather than the *Triglochidiatus* section.

The Arizona hedgehog cactus occupies a narrow geographical range within central Arizona including the Pinal, Dripping Springs, Superstition, and Mescal Mountains. This cactus can also be found in the highlands between the Towns of Globe and Superior. More specifically, the Arizona Rare Plant Committee (2001) reports its range as the Superstition Mountains and Top of the World on the TNF. However, two small subpopulations occur outside this area, the Apache Peak subpopulation north of the Town of Globe and the El Capitan subpopulation south of Globe. These populations (main and two subpopulations) are “classical” variety *arizonicus* and are the only populations of the Arizona hedgehog cactus subject to the protection and restrictions

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of the Act. This cactus occurs on the TNF, Arizona State Land Department trust lands, lands administered by the Bureau of Land Management (BLM), and privately-owned lands. Land ownership of the main population area is about 17,500 acres on the TNF, 550 acres of State trust land, and 825 acres of privately owned land (USFS 1996). Acreage on BLM lands is unknown.

The distribution of the Arizona hedgehog cactus occurs within the ecotone between Madrean Evergreen Woodland and Interior Chaparral at elevations ranging from 3,300 to 5,700 ft. (1,130-1,585 m). Preferred habitat for this cactus is exposed and stable bedrock or boulders exhibiting sufficient fracturing of rock interstices for establishment. Parent rock materials of preferred habitat are Schultze granite and Apache Leap tuff (dacite), both igneous in origin (AGFD 2003, USFS 1996). Pinal schist and the Pioneer formation in proximity to the dacite and Schultze granite also provide habitat for the cactus, but only where these formations express themselves as exposed bedrock (USFS 1996). The majority of Arizona hedgehog cacti are found scattered on open, rocky slopes of 20 to 90 degrees, and steep fissured cliffs (Philips et al. 1979, USFWS 1985). Its roots invade cracks, fissures, or interstices within exposed rock or narrow pockets between boulders where the microclimate provides the necessary periodic moisture, moist soils, and shelter from high temperatures (USFS 1996). The cactus may be found on flatter ground and more open slopes as well as, in the understory of shrubs, but moderate to high shrub densities and associated deeper soils tend to preclude the cactus (USFS 1996).

No range-wide surveys have been conducted for the Arizona hedgehog cactus. Direct access to a large portion of the species range is very limited due to the rugged topography and remoteness of its habitat. As a consequence, reliable estimates on abundance counts are limited. In addition, this variety can be difficult to distinguish from other species such as *E. santaritensis*. Current taxonomic work will aid in better identification of Arizona hedgehog cactus populations, particularly those occurring on the fringes of its range. Information and population trend status for the species is primarily reported by those projects requiring section 7 consultation.

Threats to the Arizona hedgehog cactus include habitat destruction and fragmentation by mining, mineral exploration, road construction, power-line construction and utility corridors, off-highway vehicle use and other recreational activities, rangeland improvements including water developments, trampling by livestock, and illegal collecting. Additional threats to the cactus include wildfire, herbicide and pesticide application, and insect infestation (Philips et al. 1979, AGFD 2003, USFS 1996).

Approximately 41 consultations have been completed with the TNF that evaluated the Arizona hedgehog cactus. All but five of these concluded that the Arizona hedgehog cactus included 'not likely to be adversely affected' determinations. The Arizona hedgehog cactus was 'likely to be adversely affected' from a treatment of noxious or invasive plants on the TNF, exploration actions for the Resolution Copper Mine, actions on the Bellevue Grazing Allotment, and the TNF Land and Resource Management Plan (LRMP). The TNF LRMP concluded that the proposed actions were not likely to jeopardize the species. Participation in the development of the species recovery plan, implementation of the habitat measures in the species' conservation strategy, and working with mining companies to establish conservation easements were recommended conservation actions for the TNF. The fifth 'likely to adversely affect' is this consultation regarding the suppression activities of the Frio Fire. The 2011 National Fire

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Retardant Consultation concluded that the proposed actions of the Forest Service were not likely to adversely affect the Arizona hedgehog cactus (USFWS 2011).

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State and private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of actions now under consultation.

Description of the Action Area

TNF defined the action area as the location of fire activity, suppression activities, and an area that extended approximately three miles from any suppression activity, in or outside the fire boundary. The fire boundary is defined as the boundary that encompasses areas burned naturally by the fire and suppression actions. This action area included a three-mile buffer perimeter as stated in the BA, and portions of five 6th code Hydrologic Unit Code (HUC) watersheds. These watersheds include the Bloody Tanks Wash, Russell Gulch, Upper Mineral Creek, Lyons Fork, and Upper Pinto Creek on the Globe Ranger District. The terrain in the action area, as described above, is low to steep terrain, with vegetation types ranging from ponderosa pine, alligator juniper, gray oak, and Emory oak chaparral association, to manzanita chaparral-Arizona pinyon, and Turbinella ecosystems. These types of ecosystems historically burn in a mosaic at low intensities. Chaparral and ponderosa pine ecosystems are fire dependent, and adapted to these historical, low intensity fires. However, non-native grasses can increase fire frequency and intensity to the point that these fire adapted species cannot recover (Brooks 2007). Fire management is moving back towards historical low-intensity management burns which oak, and chaparral ecosystems are better adapted to (USFS 2000). Elevation was between 5,100 and 6,600 feet (ft) (1,554 and 2,012 meters (m)). The fire area was in the general vicinity of Township 1 South (T1S) and Range 14 East (R14E), five miles southwest of Globe, Arizona. FR 580 essentially divides the fire area in half. The fire area contained the vegetation types described above. The fire burned a total of 3,966 acres, of which 358 are potentially suitable Arizona hedgehog cactus habitat, according to the BA. The potential cactus habitat was determined using known habitat parameters including elevation, biotic community, and geologic preference that were input into a Geologic Information System (GIS) layer and overlaid with the fire perimeter (Appendix B).

Status of the species and habitat, and factors affecting the species within the action area

Two locations of Arizona hedgehog cactus have been documented within one mile of the fire boundary. The TNF has determined that potentially suitable habitat for the cactus occurs within the fire perimeter, but no known surveys were completed prior to the fire, and no surveys for the cactus have been completed since the fire.

The BA concludes that the Frio Fire itself likely adversely affected the cactus. All plant life within the fire boundary experienced some level of burn, singeing, or desiccation from heat

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stress. The fire burned at moderate intensity, so ground scorching is not expected, though drying or soil disturbance is likely. Chaparral ecosystems are fire adapted, but the possibility of soil being displaced, seeds and flowering cactus being burned past viability, and defoliation of shrubs that provided the understory shelter that the cactus needs is likely.

Wildfires can cause some short-term loss of cactus habitat by causing disturbances to the seed beds, changing the soil chemistry with ash, and burning the soil. Specific information on fire adaptations of the Arizona hedgehog cactus is not available. It is known that the amount of epidermis burned on a cactus is critical. The epidermis of a cactus allows the cactus to produce its own energy. The more epidermis burned, the greater the reduction in the ability to function and produce energy. Single-stemmed individuals would be more susceptible to fire than a multi-stemmed individual because single-stemmed individuals are smaller. Smaller individuals have less epidermis, which increases their risk of burning past the ability to produce energy; and smaller individuals also lack outer stems to protect the inner stem (USFS 2013). The current condition of the potential habitat in the action area is disturbed due to the removal of ground cover, and the unknown but assumed presence of seed beds in that habitat being disrupted. No surveys since the fire have been done to assess the extent of disturbed potentially suitable habitat. Furthermore, the potentially suitable habitat was unsurveyed prior to the fire, and has not been surveyed post-fire. Numbers of Arizona hedgehog cactus prior to the fire and within the fire boundary are not known. According to TNF staff, there were some Arizona hedgehog cactus but not a lot in the vicinity of the proposed action area and that one or two plants were in the fire perimeter and were blackened, however no plant counts were done (Taylor, TNF, pers. comm. 2012).

The action area includes the Sulphide del Ray campground. Given the close proximity to occupied hedgehog habitat, some impacts from recreation may occur to the species. Since the hedgehog cactus is not surveyed regularly on TNF land, it is not known if the species experiences OHV use, impacts from recreationalists, or other ground disturbance activities. The southwest is also undergoing drought conditions and the fire regime has been affected by past managements and climate conditions. Drought conditions further stress individual plants, and can make them more susceptible to boring insects and disease. These threats were all present prior to the fire, will persist as the ecosystem recovers, and will continue post-recovery.

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.

According to the TNF, the presence of approximately 358 acres of unsurveyed potential suitable habitat was within the fire perimeter, and the creation of a fire line occurred in this potentially suitable habitat. Since a fire line displaces soil and a backfire will burn vegetation, any Arizona hedgehog cactus and habitat were adversely affected as all organic material would be removed

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from the firebreak. Removal would be through the scraping/digging of the fire line soil, or the backfire burning away vegetation from the fire line to slow or stop the spread of the fire. Individual Arizona hedgehog cactus in the fire perimeter would have experienced the same impacts as described for the fire itself. Vegetation along this fire line was described as burning at low intensity by the TNF. Effects could include burns, singeing, or desiccation from heat stress. Ground scorching was not expected, though drying or soil disturbance is likely. We believe that it is reasonable to conclude that there is potential for cactus within this burn line to be negatively impacted through displacement, scarring, searing, loss of cover, or mortality. However, even though this burn line in potential Arizona hedgehog cactus habitat may have impacted the species, we recognize the suppression activities as necessary to prevent catastrophic losses to surrounding areas, and other habitats.

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 the Arizona hedgehog cactus, 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 Arizona hedgehog cactus. There is no critical habitat designated for the cactus, so no critical habitat was destroyed or adversely modified.

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.

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The Arizona hedgehog cactus will not be evaluated for incidental take due to the definition in the Act that there is not incidental take for endangered or threatened plant species.

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 potential habitat that was within the fire area be surveyed for two years post-fire consultation to determine if any potential seed bed that was present in the area regenerates.
2. We recommend that any other potential habitat in the action area be surveyed to determine if there are other Arizona hedgehog cactus individuals.
3. We recommend that the TNF continue to work with partners to study how fire effects the species which will assist in evaluation of future events.

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) 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; (2) 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 (3) a new species is listed or critical habitat designated that may be affected by the action.

We appreciate your consideration of the Arizona hedgehog cactus. For further information, please contact Nichole Engelmann (x237) or Debra Bills (x239). Please refer to consultation number 22410-2011-FE-0477 in future correspondence concerning this project.

Sincerely,

/s/ Mike Martinez for

Steven L. Spangle
Field Supervisor

Mr. Neil J. Bosworth

cc (electronic copy):

Wildlife Biologist, Fish and Wildlife Service, Phoenix, AZ (Attn: Kathy Robertson)

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

cc (hard copy):

Regional Supervisor, Region VI, Arizona Game and Fish Department, Mesa, AZ

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APPENDIX A

Concurrence

This appendix documents our concurrence with your determination of “may affect, not likely to adversely affect” for the Mexican spotted owl (MSO) and its critical habitat.

The Frio Fire burned a total of 3,966 acres of critical habitat, including four MSO protected activity centers (PACs). These PACs were the Madera Peak South, Madera Peak North, Frio Spring, and Sulphide del Ray. The Frio Fire burned predominantly at low to moderate intensities. Wildfires that are of low-moderate intensities have been shown to increase suitability of MSO habitat (USFWS 2012). The fire and suppression actions associated with the fire that may have affected the owl include smoke drift from backfiring, temporary displacement of prey, the use of ground ignitions around and in a few PACs, and noise disturbance from chainsaws and a dozer. Ground ignitions created an under burn at high severity that removed ground cover, brush, and smaller trees. These ground ignitions are a form of backfiring, and only removed vegetation in narrow strips. Ignitions ranged from zero to thirty-eight feet outside of PACs, with a few ignitions occurring within PACs.

Mexican spotted owl (MSO)

The MSO was listed as a threatened species in 1993 (USFWS 1993). Critical habitat was designated for the MSO in 2004 (USFWS 2004). 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. A revised Recovery Plan for the MSO was approved and finalized in 2012 (USFWS 2012), which includes a detailed account of the taxonomy, biology, and reproductive characteristics of the MSO (USFWS 2012). The information provided in those documents is included herein by reference. The MSO’s entire range covers a broad area of the southwestern United States and Mexico; however 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 Madera South, Madera North, Frio Springs, and Sulphide del Ray PACs are located in the Frio Fire perimeter, and all of the burn area was classified as critical habitat for the MSO. Occupancy was inferred or confirmed in the four PACs that were located within the burned area. The fire and suppression activities occurred between August 18, 2011 and October 15, 2011. This time period overlaps briefly with the MSO nesting season of March 1-August 31.

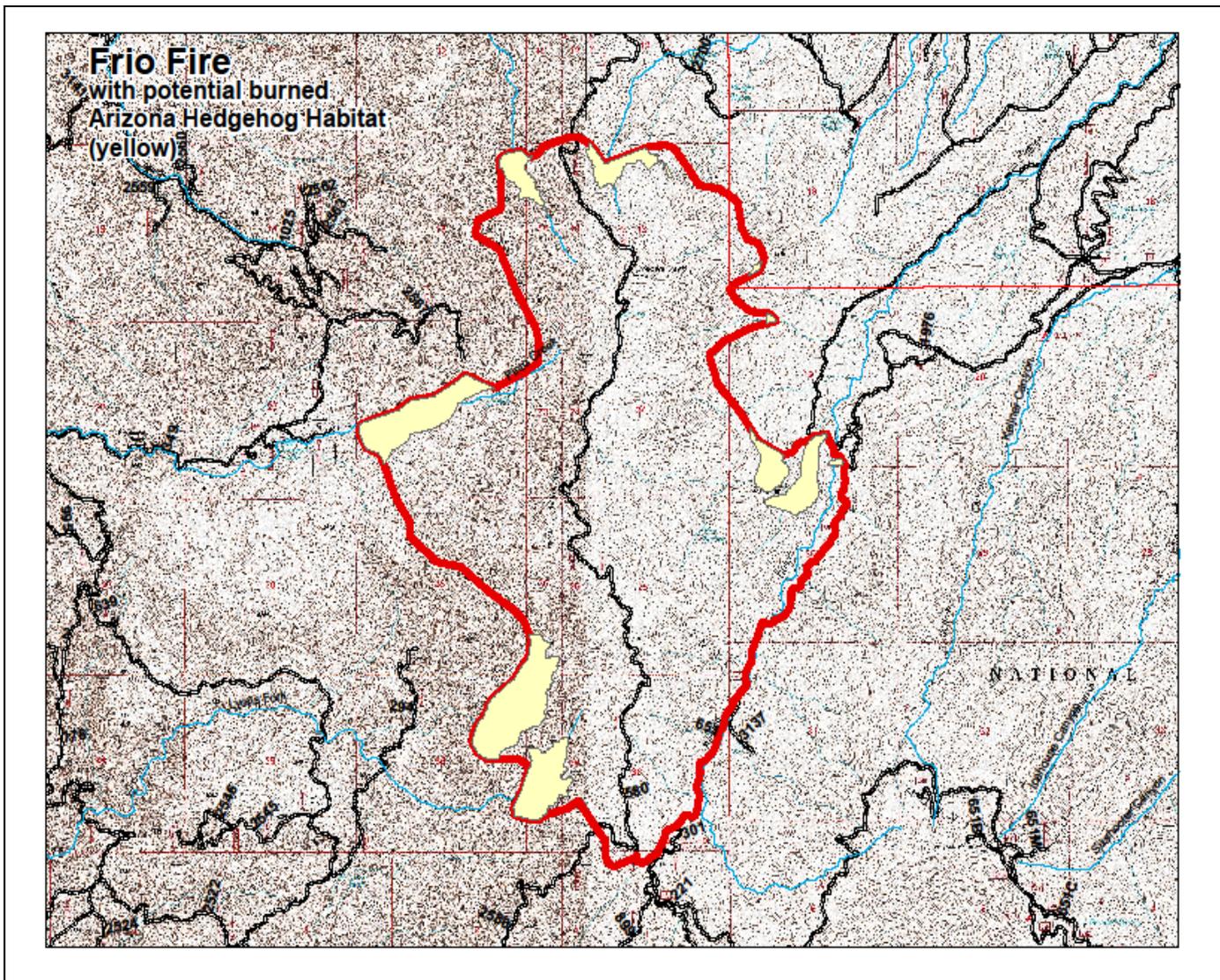
Despite the likely occupancy, and the brief overlap with the breeding season, the FWS concurs with your determination that the suppression actions may affect, but are not likely to adversely affect the Mexican Spotted Owl for the following reasons:

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1. No helicopters or aerial fire retardant, or water drops were used in suppression efforts for this fire.
2. Noise from equipment, chainsaws and dozers, which were in and near MSO PACs was minimal due to the short duration of the usage. Chainsaws were used for one week along roads, including FR 580 which goes through a PAC, so distance varied from 0-38 ft. (0-11 m.); chainsaw work started after August 31, 2011. The dozer line was approximately one mile away from the nearest PAC, and reinforced 1 mile of existing firebreak.
3. Smoke drift from the management ignitions was also minimal due to the short duration, and low-moderate burn intensity.
4. The distance between PAC boundaries and the ground ignitions ranged from three feet to thirty-eight feet; a few ignitions occurred within PACs, one being on the right side of the Madera Peak North Core area. Ground ignition burns only removed narrow strips of vegetation. Effects were concluded to be minimal with the amount of smoke from the suppression action being minimal. Hand ignitions burned at low-moderate burn intensities, occurred in phases with small areas burned for a few hours at a time, and overall occurred for a short duration of the action.
5. Impacts to PCEs, including large dead trees (snags), the presence of a wide range of tree species including hardwoods, and the presence of a high volume of fallen trees and other woody debris were minor. The adjacent critical habitat outside of the fire suppression zone was not impacted.

APPENDIX B

Frio Fire boundary with potential Arizona hedgehog cactus habitat



-  **Frio Fire Boundary**
-  **Potentially suitable Arizona hedgehog cactus habitat (Totaling 358 acres)**