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In Reply Refer To:
AESO/SE
22410-2011-F-0175

June 14, 2011

Mr. M. Earl Stewart
Forest Supervisor
Coconino National Forest
1824 South Thompson Street
Flagstaff, Arizona 86001-2529

RE: Inner Basin Pipeline Reconstruction Project

Dear Mr. Stewart:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated June 3, 2011, and received by us on June 6, 2011. This consultation concerns the possible effects of the City of Flagstaff's Inner Basin Pipeline Reconstruction Project located on the Flagstaff Ranger District, Coconino County, Arizona. The Forest Service has determined that the proposed action may affect the threatened Mexican spotted owl (*Strix occidentalis lucida*) (MSO).

You also requested our concurrence that the proposed project may affect, but is not likely to adversely affect, MSO critical habitat. We concur with your determination. The basis for our concurrence is found in Appendix A.

This biological opinion is based on information provided in the June 3, 2011, Biological Assessment (BA), conversations and electronic correspondence with Forest Service staff, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species addressed or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation History

Details of the consultation history are summarized in Table 1.

Table 1. Summary of Consultation History

Date	Event
January 20, 2011 to Present	We began discussions with the City of Flagstaff and the Forest Service regarding the Inner Basin Pipeline Reconstruction Project. Electronic mail correspondence regarding the project has continued to date.
March 24, 2011	We attended a meeting hosted by the City of Flagstaff to discuss the project and develop a collaborative process for moving forward on completing project design, National Environmental Policy Act (NEPA) compliance, and section 7 consultation under the Endangered Species Act.
May 27, 2011	We received a draft biological assessment for the project from the Forest Service.
June 2, 2011	We provided comments to the Forest Service on the draft biological assessment.
June 6, 2011	The Forest Service requested formal consultation for potential adverse affects to the MSO resulting from implementation of the Inner Basin Pipeline Reconstruction Project.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

In the aftermath of the 2010 Schultz Fire, monsoon storms triggered major debris flows on the steep slopes of the San Francisco Mountains, causing substantial damage to the Waterline Road (also known as Forest Road 146) and the Inner Basin Pipeline. The pipeline supplies drinking water to and is maintained and operated by the City of Flagstaff. Initial emergency repairs were made to the Waterline Road in the immediate aftermath of the wildfire; however, these repairs were washed out following additional precipitation events. The City of Flagstaff collected information over the winter 2010-2011 that showed the Waterline Road was damaged or rendered impassable in at least 40 locations and that the pipeline buried in the road was severed in at least 17 locations (see Figures 2 and 3 in BA, page 20).

The Inner Basin Pipeline provides water from a number of springs in the Inner Basin of the San Francisco Peaks and delivers this water through gravity flow to the City of Flagstaff's public works facilities. Without water from the Inner Basin Pipeline, the City is primarily dependent on the Lake Mary Reservoir, which requires higher costs for water delivery and includes a limited supply. This project involves repair of the water pipeline and Waterline Road in order to ensure continued adequate water supplies for the City of Flagstaff.

This project would involve reconstruction of the Inner Basin drinking water pipeline and Waterline Road located on the east slope of the San Francisco Peaks on the Flagstaff Ranger

District, Coconino National Forest. The project would also include relocation of approximately one mile of existing pipeline currently located in the Kachina Peaks Wilderness to the Waterline Road corridor and another pipeline right-of-way corridor outside of the wilderness.

Road and pipeline reconstruction activities would occur at 40 locations grouped into 28 sites where flood flows caused damage. Construction activities would occur simultaneously from both the north and south ends of the road, and as the road and pipeline are repaired, the pipeline would be buried in the road surface. As construction progresses, crews would continue reconstruction of the Waterline Road and pipeline towards the middle. Reconstruction efforts would include the following activities:

- *Debris Removal:* Deposited debris and sediment from the road surface and sites immediately upslope of the road would be removed. Debris removal would involve the use of heavy equipment to remove aggregate debris and large boulders. Much of this debris would be used for backfill or surfacing material.
- *Tree Removal:* Approximately 150 dead trees greater than nine inches diameter-at-breast height (dbh) would be removed adjacent to reconstruction sites to ensure a safe working environment. Trees in areas where no repair efforts are necessary would not be removed as part of this project.
- *Construction of Log Retaining Walls:* Cut and downed trees would be used to build log retaining walls on the downslope and upslope edges of the Waterline Road. All repaired or constructed retaining walls would be lined with geotextile fabric and backfilled with rock and sand.
- *Use of Rock Debris for Construction Materials:* Native materials and large boulders within the road right-of-way and disturbance areas would be used for backfill and road surfacing. This would minimize the need for hauling additional material to the project area.
- *Installation of Rock-based Structures:* Rock-based structures (stacked gabions and rock mattresses) would be built below and/or above the road and on the road surface to mitigate erosion that is compromising the slope above or under the road and to armor road surfaces to reduce erosion from future storm flows.
- *Creation of Temporary Staging and Turn-around Areas:* Staging and turn-around areas would be established to temporarily store equipment, materials, or re-fuel equipment. The footprint for these areas would total no more than 10 acres.

Each of these components is discussed in detail in the June 3, 2011, BA and is included herein by reference.

The project is expected to take approximately 80 working days to complete, from start to finish. Reconstruction activities may occur over two years and include portions of the 2011 and 2012 MSO breeding seasons (1 March – 31 August). The Forest Service will report when the project

begins and when work is completed, so that we may track effects to MSO.

Conservation measures to minimize impacts to MSO include:

1. Crews would work simultaneously on the north and south ends of the project towards the middle to attempt to minimize the temporal disturbance of the project.
2. Rock crushing, rock sorting, and chain sawing of trees would not be authorized at Staging Areas 2 and 4 (see Figure 2 in BA, page 20). Staging Area 4, which is within the Pipeline PAC, and staging area 2, which is closest to the known nest locations in the Weatherford PAC, would be used only for vehicle parking, turnarounds, and short-term (48 hours or less) staging of materials and equipment.
3. The project footprint will be kept to the existing road right-of-way whenever feasible in order to minimize ground disturbance and habitat effects.

STATUS OF THE SPECIES

The MSO was listed as a threatened species in 1993 (USDI 1993). The primary threats to the species were cited as even-aged timber harvest and stand-replacing wildland fire, 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 (USDI 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 (USDI 1993) and in the Recovery Plan (USDI 1995). The information provided in those documents is included herein by reference. Although the MSO's entire range covers a broad area of the southwestern United States and Mexico, the MSO does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older, uneven-aged forest, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico.

The United States range of the MSO has been divided into six recovery units (RU), as discussed in the Recovery Plan. The primary administrator of lands supporting the MSO in the United States is the Forest Service. Most owls have been found within Forest Service Region 3 (which includes 11 National Forests in Arizona and New Mexico). Forest Service Regions 2 and 4 (which includes 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 United States 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. Recreation 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 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 MSO through habitat modification and disturbance. As the human population grows, especially in Arizona, small communities within and adjacent to National Forest System 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, high-severity, stand-replacing wildland fire is probably the greatest threat to MSO within the action area. As throughout the West, fire severity and size have been increasing within this geographic area. Landscape level fires, such as the Rodeo-Chediski Fire (2002) and currently the Wallow Fire (2011), have resulted in the loss of thousands of acres of occupied and potential MSO habitat across significant portions of its range.

Global climate variability may also be a threat to the MSO and synergistically result in increased effects to habitat from fire, fuels reduction treatments, and other factors discussed above. 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, invertebrate, and vertebrate populations within coniferous forests and canyon habitats that affect ecosystem function and processes.

A reliable estimate of the numbers of owls throughout its entire range is not currently available (USDI 1995) and the quality and quantity of information regarding numbers of MSO vary by source. USDI (1991) reported a total of 2,160 owls throughout the United States. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico. However, Ganey *et al.* (2000) estimated 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 PACs established on National Forest System (NFS) lands in Arizona and New Mexico (B. Barrera, pers. comm. June 18, 2007). The FS 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 (Λ =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 227 formal consultations for the MSO. These formal consultations have identified incidences of anticipated incidental take of MSO in 436 PACs over the course of 18 years. The form of this incidental take is almost entirely harm or harassment, rather than direct mortality, and many of these actions have resulted in single or short-term disturbance to owls that has not resulted in long-term harassment, habitat degradation, or habitat loss. 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 BO was issued the same day.

In 1996, we issued a biological opinion on FS 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. FS 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 49 PACs over approximately five years. However, because some of this incidental take has been in the form of short-term harassment that has occurred and is no longer on-going, we are continuing to track incidental take in 42 PACs associated with actions covered under the 2005 LRMP BO (21 harm, 21 harass). Prior to the 2011 fire season, incidental take associated with Forest Service fire suppression actions, which was not included in the LRMP proposed action, had resulted in the incidental take of owls associated with 27 PACs (6 harm, 21 harassment).

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 action area is located on the east side of the San Francisco Peaks and encompasses a total of 3,531 acres, with elevation ranging between approximately 7,600 to 9,600 feet. It is composed entirely of Forest Service lands. Prior to June 2010, this area consisted of “green” mixed conifer and subalpine forests. In late June 2010, the Schultz Fire burned through approximately 83% (2,925 acres) of the action area. Fire behavior resulted in high-severity fire effects over most of the action area (44%), while 17% of the action area was not burned at all.

The action area, as described by the Forest Service, includes the Waterline Road and 0.25 mile either side of the road, including the construction sites and the area where the new pipeline would be installed. FWS general guidance is to limit potentially disturbing activities to areas at least 0.25 mile from MSO PACs during the breeding season. However, this guidance typically applies to areas that contain forested habitat (which help buffer sound) between the activity and the PAC. It is likely that noise will carry farther in recently burned landscape, so it is possible that the action area should be larger, particularly on the upslope side of the Waterline Road (noise tends to rise). Therefore, though all of the acreages reported for the action area reflect a 0.25 mile buffer on either side of the road, in our effects analysis, if there is not a strong topographic buffer (such as a ridge) bounding the 0.25 mile area, we will consider a larger action area because of the potential for noise to travel further upslope.

A. Status of the species within the action area

The action area contains portions of four MSO protected activity centers (PACs), steep-slope protected habitat, and restricted habitat. The four PACs (listed from north to south) in the action area are: East Bear Jaw (#030402033), Jack Smith (#030402009), Pipeline (#030402001), and Weatherford (#030402008). The status of the species prior to last summer throughout most of the action area was quite different from that following the Schultz Fire. The Schultz Fire was started by an abandoned campfire on June 20, 2010, and burned approximately 15,075 acres on the Coconino National Forest, including most of the action area for this project. Approximately 40% of the fire area resulted in high severity fire effects, killing most of the vegetation and resulting in public safety and rehabilitation concerns. Most of the MSO habitat and three of the PACs within the action area were impacted by high severity fire effects. Table 2 contains a summary of the MSO habitat and the amount that burned during the Schultz Fire within the action area. These numbers are somewhat different from the numbers provided in the BA, but are correct based upon conversations with Forest Service staff (Courtney Frost, pers. comm. June 6, 2011).

Table 2. Acres of MSO (PAC, protected steep-slope, and restricted) and other forest habitat in the action area and amount of each habitat that burned in the 2010 Schultz Fire.

MSO Habitat	Habitat in the action area¹ (acres)	Habitat in the action area (percent)	Habitat burned in Schultz Fire (acres)	Habitat burned in Schultz Fire (percent)
PAC	1,031	29%	977	95%
Protected steep-slope	750	21%	586	78%
Restricted	1,589	45%	1,327	84%
Other Forest	162	5%	34	21%
Total	3,532	100%	2,924	83%

Table 3 lists the acres of MSO habitat and fire severity effects following the Schultz Fire. The majority of the MSO habitat in the action area experienced moderate to high-severity fire effects. The fire resulted in high-severity fire effects in approximately 54% of PAC habitat and 61% of protected steep-slope habitat. Approximately 22% of protected (PAC and steep-slope) habitat within the action area was unburned or burned with low-severity effects. However, there is unburned and low to moderately burned habitat located outside of the action area, particularly to the west and northwest of the southern end of the project area (within and adjacent to the Weatherford PAC).

Fire severity is a post-fire assessment of effects that incorporates both fire line intensity and heat per-unit-area; it is a qualitative and quantitative measure of the effects of fire on site resources such as soil and vegetation. Definitions we use to define low, moderate, and high severity fire are from the Forest Service Region 3 Burn Area Emergency Rehabilitation General Guidelines and are briefly summarized below:

- **Low Severity** is typical of high-frequency, low-intensity burns common in the ponderosa pine type in the Southwest. Surface fuels may be nearly completely consumed along with much of the duff layers. Organic matter in the soil profile below the duff is

¹ Acres include the Waterline Road and 0.25 mi on either side.

generally left intact. Individual trees or groups of trees may be torched and killed, but generally the larger trees that are burned have retained some green needles, and most of the scorched needles are still present on the trees.

- **Moderate Severity** fires are typical of a mix of low-severity and stand-replacement fires. Most, if not all of the surface fuels are consumed and the overwhelming majority of the trees are 100% scorched. Dead needles are still present on the scorched trees and usually begin to fall shortly after the fire. The needle cast can serve as a protective layer on the soil surface until surface vegetation begins to reestablish. The duff layers and some of the organic material in the soil are consumed, though ground char does not indicate the removal of the organic matter in the upper soil horizons. Scattered pockets of high-severity burn may exist that are too small to separate out as individual high-severity burn areas.
- **High Severity** fires are typical of stand-replacement fires. Surface fuels, duff, and organic matter in the soils are volatilized. Needles are completely consumed and hydrophobic soils are often created in certain types of soils.

Table 3. Total amount (in acres) of MSO habitat (PAC, protected steep-slope, and restricted) and other forest habitat by fire severity within the action area.

Habitat	Fire Severity								
	Unburned		Low		Moderate		High		Total
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres
PAC	54	5%	151	15%	272	26%	554	54%	1,031
Protected steep-slope	163	22%	53	7%	74	10%	459	61%	750
Restricted	262	16%	315	20%	459	29%	553	35%	1,589
Other Forest	128	79%	22	14%	9	5%	3	2%	162
Total	607	17%	541	15%	814	23%	1,569	44%	3,352

As stated above, four MSO PACs are located in the action area. Table 4 lists the PACs, their size, the amount of each PAC in the action area, and the amount of each PAC that burned (by severity) in the Schultz Fire. Roughly half of the Pipeline and Jack Smith PACs are located within the action area, while approximately two-thirds of the Weatherford PAC is within the action area. Only a very small percentage (~1%) of the East Bear Jaw PAC intersects the action area. Prior to the Schultz Fire, the Weatherford PAC was the only PAC with known nest locations.

Table 4. Total PAC size, amount of each PAC within the action area, and amount of each PAC burned (by severity) in the Schultz Fire.

PAC	Total PAC Size (acres)	Acres (%) of PAC within action area	Total Acres (%) of Low/Moderate/High Fire Severity within each PAC		
			Low	Moderate	High
East Bear Jaw	722	7 (1%)	0 (0%)	0 (0%)	0 (0%)
Jack Smith	604	259 (43%)	97 (16%)	249 (41%)	250 (41%)
Pipeline	644	334 (52%)	10 (2%)	102 (16%)	529 (82%)
Weatherford	653	431 (66%)	95 (15%)	209 (32%)	268 (41%)

The Weatherford and Pipeline PACs have been consistently occupied by owls over the last 22 years (1984 -2006). Based upon the history of occupancy and apparent high site-fidelity of MSO to these areas, it is highly likely that MSO associated with these PACs are still present within the action area, though nesting and roosting habitat is likely very limited. The East Bear Jaw and Jack Smith PACs have not been surveyed as often as the other two PACs, so the frequency of known occupancy for these sites is unknown. However, as indicated above, nesting and roosting habitat is still present within the East Bear Jaw PAC as it is located outside the Schultz Fire perimeter. None of these PACs were surveyed immediately pre-fire or have had surveys following the Schultz Fire.

B. Factors affecting the species within the action area

The factors currently affecting the MSO within the action area are the post-fire habitat effects from the Schultz Fire (i.e., loss of key habitat components such as canopy cover, multi-story canopy layers) and the long-term burned area emergency rehabilitation (BAER) activities (efforts to improve public safety and assist with the regeneration process, consultation #22410-2011-I-0150). Following the fire, a BAER team prepared an Emergency Stabilization and Rehabilitation Plan to document fire effects and to recommend short-term mitigation and long-term management. Though we have consulted on the long-term BAER activities, we have yet to receive consultation requests for the short-term BAER actions or suppression impacts associated with the fire.

As indicated in Tables 3 and 4 above, a majority of the action area burned at high-severity leaving very little MSO nesting and roosting habitat within the action area, or within three of the four PACs. In addition, much of the MSO mixed-conifer restricted habitat burned at high-severity within (and outside of) the action area.

Direct and indirect fire effects on MSO habitat include the alteration of vegetation structure, soil, and watershed conditions. These effects can be detrimental, beneficial, or both depending on the severity and intensity of the fire and suppression actions taken in owl habitat, the type of owl

habitat impacted (e.g., nesting, foraging), the extent of the fire, and the time of year. High-severity burns, such as the Schultz Fire, have the most negative long-term effects on spotted owl nest and roost habitats. However, these fires may also result in enhanced foraging habitats used by owl prey species. Bond et al. (2002) monitored the fate of 21 banded spotted owls representing the northern, California, and Mexican subspecies. They concluded that when relatively large wildfires burned known nest and roost sites, the fires appeared to have a low short-term effect on survival, site fidelity, mate fidelity, and reproductive success when compared to estimates independent of fire effects. We have no data regarding the long-term use of these habitats by MSO.

Bond et al. (2009) evaluated fire effects on seven radio-marked California spotted owls and found that owls roosting during the breeding season selected low-severity burned forest and avoided moderate- and high-severity burned areas. Bond et al. (2009) also found that most owls foraged in high-severity burned forest more than other burned-forest categories. Furthermore, within 0.6 mile of the center of foraging areas, foraging owls selected all severities of burned forest and avoided unburned forest. Anecdotal evidence from MSO monitoring suggests that PACs burned with moderate-to-high fire severity continue to be occupied by owls; however, owl surveys conducted two years post-fire in previously occupied but severely burned areas (e.g., within the Dude and Rodeo-Chedeski fires on the Mogollon Rim in Arizona) failed to locate spotted owls. We do not have any current survey information from the action area with which to infer absence or presence of MSO. However, based upon the fact that spotted owls have high site fidelity (pre- and post-fire), we would infer that MSO are likely still using the action area, though nest and roost sites likely do not occur within the high-severity burn areas.

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 caused by the proposed action and are later in time, but are still reasonably certain to occur.

The proposed action will result in the minimal loss of MSO PAC habitat, a small loss of some key habitat components, and short-term (one to two years) noise disturbance to MSO. We define disturbance as a non-habitat altering action (e.g., noise, lights) that disrupts or is likely to disrupt owl behavior. Based upon the project description, disturbance is likely to occur during the latter half of the 2011 and first half of the 2012 MSO breeding seasons. We discuss the potential habitat and disturbance effects to MSO below.

Habitat Effects

We expect that habitat impacts from the project (the loss of approximately two acres of MSO habitat and removal of 150 snags) will be insignificant and discountable to MSO within the

action area. The BA estimates that one acre of MSO PAC habitat (~0.53 acres lost in the Pipeline PAC, ~0.44 acres in the Weatherford PAC) and 0.75 acre of protected steep-slope and restricted habitat will be temporarily modified for the use of approximately four flat areas along the Waterline Road as equipment/supply staging areas. All of these locations are immediately adjacent to the Waterline Road, which is already a cleared corridor, so impacts to MSO are likely to be negligible. MSO key habitat components will be lost through the removal of approximately 150 snags (dead trees) greater than nine inches dbh. Approximately 22 snags will be removed from the Weatherford PAC and 29 snags from the Pipeline PAC. Snags will also be removed from protected steep-slope and restricted mixed-conifer habitats. However, though this project will remove these snags permanently, due to the Schultz Fire, snags are plentiful throughout the action area and landscape, and the removal of these dead trees will not affect the overall abundance and distribution of snags.

In summary, the effects of the removal of approximately 150 snags and the loss of two acres of MSO habitat is not expected to result in significant impacts to MSO in the action area or impede the recovery MSO habitat within the action area or the Upper Gila Mountain RU. Due to the effects of the Schultz Fire, the eastern side of the San Francisco Peaks contains an abundance of snags of many size classes. In addition, the loss of the one acre of MSO PAC habitat and 0.75 acre of protected steep-slope and restricted habitat will not influence our ability to manage MSO habitat on the San Francisco Peaks into the future.

Disturbance Effects

MSO are likely to be affected by noise and visual disturbance associated with project activities. Vehicular traffic will occur on a daily basis within 0.25 mile of the East Bear Jaw PAC and directly within the Jack Smith, Pipeline, and Weatherford PACs. Heavy construction (rock crushing, chain saws, etc.) will occur on a daily basis within the Pipeline and Weatherford PACs and in adjacent restricted and protected steep-slope habitat throughout the action area. Impacts from traffic and construction activities will occur for the length of the project (80 working days) and will occur consistently during latter half of the 2011 and first half of the 2012 MSO breeding season.

To minimize the impacts of noise from project activities, activities with the highest risk of causing sound impacts on MSOs will not be allowed to occur in staging areas 2 and 4, which are centrally located within Weatherford and Pipeline PACs (see BA, Figure 3). Prohibited activities at these sites will include rock crushing, rock sorting, and chain sawing of trees. The staging area in the Pipeline PAC (staging area 4), and the staging area closest to known nest locations in the Weatherford PAC (staging area 2) will be used only for vehicle parking, turn-arounds, and short-term (≤ 48 hours) staging of materials and equipment. This will prohibit excessive stockpiling of materials at these staging areas, and limit the amount of material, manpower, and noise that will occur at a staging area at any one time.

There are a growing number of studies attempting to describe and quantify the impacts of non-lethal disturbance on the behavior and reproduction of wildlife, and MSO in particular. Delaney *et al.* (1997) reviewed literature on the response of owls and other birds to noise and concluded the following: 1) raptors are more susceptible to disturbance-caused nest abandonment early in

the nesting season; 2) birds generally flush in response to disturbance when distances to the source are less than approximately 200 feet and when sound levels are in excess of 95 dBA; and 3) the tendency to flush from a nest declines with experience or habituation to the noise, although the startle response cannot be completely eliminated by habituation. Delaney *et al.* (1999) found that ground-based disturbances elicited a greater flush response than aerial disturbances. Our guidance is to limit potentially disturbing activities to areas ≥ 0.25 mile from MSO PACs during the breeding season (March 1 through August 31). This corresponds well with the Delaney *et al.*'s (1999) 0.25 mile threshold for alert responses to helicopter flights. In addition, Delaney *et al.* (1999) found that MSO did not flee from helicopters when caring for young at the nest, but fled readily during the post-fledgling period. This may be a result of optimal fleeing decisions that balance the cost-benefit of fleeing. Frid and Dill (2002) hypothesize that this may be explained using predator risk-disturbance theory, and perhaps the cost of an adult MSO fleeing during the nestling period may be higher than during the post-fledgling period.

Noise and visual disturbance associated with vehicular traffic and construction may disturb breeding and foraging behaviors of MSOs. Though nesting and roosting habitat is limited within the action area, there is potential unburned nest/roost habitat within and adjacent to the Weatherford PAC in the southern portion of the action area, in areas just west of the Jack Smith PAC, the area along the upslope portion of the northern end of the action area, and throughout the East Bear Jaw PAC (see Figures 3 and 4 in BA, pages 21-22). Such disturbance may cause adults to flush from roosts, abandon nests, flush from nests while tending young, or avoid a nest altogether for an extended period of time. This could have effects on young owls through a reduction in the number of prey deliveries, reduced thermoregulation, and/or increased susceptibility to predation (Knight and Cole 1995). In addition, MSO may avoid areas of construction, which could disrupt foraging habits and cause an increase in energy expenditure for a lower return on foraging success. This could, in turn, result in a decline in physical condition and could ultimately affect both the survival of adults and their young. Human disturbance can also act as a form of increased predation risk (Frid and Dill 2002).

MSO associated with the Weatherford and Pipeline PACs are known to have consistently used the action area (pre-wildfire). We suspect that the Jack Smith PAC was occupied pre-fire, and there is no reason to assume that MSO are not using habitat associated with the East Bear Jaw PAC. However, due to the Schultz Fire, MSO associated with the Jack Smith, Pipeline, and Weatherford PACs are likely still adjusting to the habitat changes within and adjacent to the action area and may be more sensitive to noise disturbance due to the loss of their historical nest/roost locations (those nest/roost locations we knew of in the Weatherford and Pipeline PACs). There are also unburned, low, and moderate severity burned areas on the upslope side of the Waterline Road just beyond the 0.25 mile buffer along these three PACs. Owls could be roosting, or even nesting, in this habitat and noise may extend beyond 0.25 mile from project activity where habitat is severely burned and there is little topographic screening. In addition, prey abundance is likely high post-fire throughout the action area, so we would expect to find MSO foraging in this area, regardless of the reduction in nest/roost habitat. Based upon close examination of the topography between the East Bear Jaw PAC and the action area, it is likely that topography and vegetation may assist with screening (or at least reducing) project generated noise in this PAC.

In summary, the proposed action will result in short-term (one to two year) disturbance to MSO associated with the Jack Smith, Pipeline, and Weatherford PACs. This disturbance could result in decreased fitness to owls associated with these PACs and/or impacts to reproduction as described above. However, based upon the duration (no more than two breeding seasons) and the insignificant habitat effects from the proposed action, this project will not impede the recovery of MSO within the Upper Gila Mountain RU. We do not believe that owls associated with the East Bear Jaw PAC will be as impacted by the noise as owls associated with the other PACs due to topography and vegetation that will likely buffer the noise. In addition, habitat used by owls associated with this PAC was not as impacted by the Schultz Fire as the other three PACs.

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 land within the project vicinity is almost exclusively managed by the Forest Service, most activities that could potentially affect listed species are Federal activities and subject to additional section 7 consultations. Future non-Federal actions within the project area that may be reasonably certain to occur include continued operation of the Inner Basin Pipeline by the City of Flagstaff. This activity consists of the occasional vehicle driving up the Waterline Road and minor road maintenance, and may result in localized disturbance to MSO. The extent of such possible disturbance is unknown but is expected to be relatively minor and would not impact the long-term recovery and/or conservation of MSO and their habitat within the project area or RU.

CONCLUSION

After reviewing the current status of the MSO, the environmental baseline for the action area, the effects of the proposed pipeline reconstruction project, and the potential for cumulative effects, it is our biological opinion that implementation of the Inner Basin Pipeline Reconstruction Project, as proposed, is not likely to jeopardize the continued existence of the MSO.

We present this conclusion for the MSO for the following reasons:

1. The project footprint is relatively small temporally and spatially and will not result in long-term or permanent disturbance of MSO associated with the action area.
2. The implementation of the proposed action is not expected to impede the survival or recovery of MSO within the Upper Gila Mountains RU as an insignificant amount of

MSO habitat will be removed and/or modified, and noise disturbance will occur over no more than two breeding seasons.

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

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further 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.

For the purpose 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 the birds are considered lost as viable members of the population and 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 habitat no longer meets the owl's needs.

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

We anticipate that the proposed action is reasonably certain to result in incidental take of MSO during the project. We anticipate that the take of MSO will be difficult to detect because finding a dead or impaired specimen is unlikely. However the level of incidental take can be anticipated by the short-term disturbance that create the likelihood of injury to MSO to such an extent as to

significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering.

Using available information as summarized within this document, we have identified conditions of incidental take for the MSO associated with implementation of the Inner Basin Pipeline Reconstruction Project within the Jack Smith, Pipeline, and Weatherford PACs. We anticipate the take of one pair of MSOs and/or associated eggs/juveniles in the form of harassment associated with the Jack Smith (#030402009), Pipeline (#030402001), and Weatherford (#030402008) PACs due to short-term disturbance that will occur over two breeding seasons (2011 and 2012) immediately adjacent to the PACs. This anticipated take is in the form of short-term (one to two year) disturbance (non-habitat altering action that disrupts or is likely to disrupt owl behavior within the PACs). The noise generated by these actions during the breeding season is likely to interrupt, impede, or disrupt normal behavior patterns to the point that breeding and feeding activities are impacted over the course of two breeding seasons.

We do not believe that noise impacts will rise to the level of incidental take for the East Bear Jaw PAC for the following reasons: 1) topography between the PAC and the action area will likely protect the majority of this activity center from noise that rises to the level of harassment; and, 2) MSO associated with this activity center may be less resource-stressed (i.e., historical nest/roost habitats are likely still available) and better able to adjust their habitat use in response to this project.

Effect of the Take

In this biological opinion we determine that this level of anticipated take is not likely to result in jeopardy to the species considered herein.

Reasonable and Prudent Measures with Terms and Conditions

No reasonable and prudent measures are included in this incidental take statement as there are no reasonable means by which this incidental take may be minimized. The Forest Service and City of Flagstaff have worked with us to minimize the potential effects of this action to the extent that they can and still accomplish the pipeline and Waterline Road reconstruction.

DISPOSITION OF DEAD, INJURED, OR SICK MSO

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

If possible, the remains of intact species shall be provided to this office. If the remains of the species 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 species survive, contact our office 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 purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that the Forest Service work with us to conduct MSO surveys across the San Francisco Peaks over the next several years to attempt to determine how MSO modify their territories in response to the Schultz Fire.
2. We recommend that the Forest Service continue to work with us to design forest restoration treatments across the Coconino National Forest that enhance and protect MSO habitat from high-severity fire.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in this biological opinion. As provided in 50 CFR Section 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat 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. 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 responsibility to American Indian Tribes, when an agency consults with us on a proposed action that may affect Indian lands, Tribal trust resources, or Tribal rights, we provide a copy of the final biological opinion to affected and interested Tribes and the Bureau of Indian Affairs. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

Thank you for your continued coordination. In all future correspondence on this project, please refer to the consultation number 22410-2011-F-0175. Should you require further assistance or if

you have any questions, please contact Shaula Hedwall at (928) 226-0614 (x103) or Brenda Smith (x101) of our Flagstaff Suboffice.

Sincerely,

/s/ Brenda Smith for

Steven L. Spangle
Field Supervisor

cc (electronic):

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Field Supervisor, Arizona Game and Fish Department, Region 2, Flagstaff, AZ
District Ranger, Flagstaff Ranger District, Flagstaff, AZ
Forest Biologist, Coconino National Forest, Supervisor's Office, Flagstaff, AZ
District Biologist, Flagstaff Ranger District, Flagstaff, AZ

cc (hardcopy):

Director, Aha Makav Cultural Society Fort Mohave Indian Tribe
Tribal Secretary, Havasupai Tribe, Peach Springs, AZ
Director, Hopi Cultural Preservation Office, Kykotsmovi, AZ
Program Manager, Tribal Historic Preservation Office, Hualapai Tribe, Peach Springs, AZ
Director, Historic Preservation Department, Navajo Nation, Window Rock, AZ
Director, Apache Cultural Program, Yavapai-Apache Nation, Camp Verde, AZ
Director, Yavapai Cultural Program, Yavapai-Apache Nation, Camp Verde, AZ
Director, Cultural Research Program, Yavapai-Prescott Indian Tribe, Prescott, AZ
Director, Zuni Heritage and Historic Preservation Office, Zuni, NM
Director, Cultural Resources, Kaibab Band of Paiute Indians, Fredonia, AZ
Director, San Carlos Tribal Historic Preservation Office, San Carlos, AZ
Director, Cultural Resources Department, Tonto Apache Tribe, Payson, AZ
Director, Cultural Resources, White Mountain Apache Tribe, Whiteriver, AZ
NEPA Coordinator, Environmental Services, Navajo Regional Office, Bureau of Indian Affairs, Gallup, NM
Environmental Specialist, Environmental Services, Western Regional Office, Bureau of Indian Affairs, Phoenix, AZ
Regional Biologist, Bureau of Indian Affairs, Southwest Regional Office, Albuquerque, NM
Native American Liaison, Southwest Region, Fish and Wildlife Service, Albuquerque, NM
(ARD-EA)

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APPENDIX A - CONCURENCE

This appendix contains our concurrence with your “may affect, not likely to adversely affect” determination for MSO critical habitat.

Mexican spotted owl critical habitat

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the MSO critical habitat. We base this concurrence on the following:

- The project will have no effect on the range of trees species composed of different sizes, the shade canopy, the availability of woody debris, the retention of Gambel oaks, or residual plant cover. Therefore, these primary constituent elements of MSO critical habitat will not be impacted by the project.
- Though approximately 150 snags may be removed, snags currently dominate the landscape within and adjacent to the action area and the removal of these snags will result in insignificant and discountable effects to this primary constituent element of MSO critical habitat.