



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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Cons: # 02ENNM00-2016-F-0440

Elizabeth A. Humphrey, District Ranger
Sacramento Ranger District
Lincoln National Forest
P.O. Box 288 (4 Lost Lodge Road)
Cloudcroft, NM 88317

Dear Ms. Humphrey:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16U.S.C. § 1531 et seq.), as amended (Act). We received the Biological Assessment (BA) dated April 7, 2016, which evaluates the impacts to the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) and the Mexican spotted owl (*Strix occidentalis lucida*) and their designated critical habitats, and the Sacramento Mountains thistle (*Cirsium vinaceum*) from ongoing livestock management on the Sacramento Allotment, Sacramento Ranger District, Lincoln National Forest (Forest Service). We also received an amended BA on September 30, 2016, incorporating changes to the proposed action for the 2016 grazing season.

The proposed action is the continuation of livestock grazing for the Sacramento Allotment. You determined that the proposed action “may affect, is likely to adversely affect” the endangered New Mexico meadow jumping mouse (jumping mouse) and its designated critical habitat; the threatened Mexican Spotted Owl and its designated critical habitat; and the threatened Sacramento Mountains thistle (thistle). The Forest Service requests initiation of formal consultation. The endangered Sacramento prickly poppy (*Argemone pleacantha* ssp. *pinnatisecta*) also occurs within the allotment. However, the ongoing action and improvements or changes in management to protect the jumping mouse do not affect the Sacramento prickly poppy differently than analyzed previously (consultation #22420-2000-F-473, February 21, 2012). Therefore, no additional analysis or biological opinion is needed for the Sacramento prickly poppy at this time.

This biological opinion relies on the revised regulatory definition of “destruction or adverse modification” of designated or proposed critical habitat from 50 Code of Federal Regulations (CFR) 402.02. As of February 11, 2016, the definition of “destruction or adverse modification” has been revised to align it with the conservation purposes of the Endangered Species Act of 1976, as amended (Act), and the Act’s definition of “critical habitat” (81 FR

7214). Specifically, the rule states: “Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.” The revised definition continues to focus on the role that critical habitat plays for the conservation of listed species and acknowledges that the development of physical and biological features may be necessary to enable the critical habitat to support the species recovery.

The current document constitutes the Service’s Biological Opinion (BO) based on our review of the proposed action and its effects on the jumping mouse, Mexican spotted owl, their designated critical habitats, and the thistle in accordance with section 7 of the Act.

CONSULTATION HISTORY

This BO is based on information submitted in the April 7, 2016, BA, the September 30, 2016, amended BA, other information available to the Service, email conversations with your staff, data in our files, site visits, data presented in the final rule to list the jumping mouse as endangered and the designated critical habitat rule (Service 2014a; Service 2016), and the May 2014 Species Status Assessment Report (SSA Report) for the jumping mouse (Service 2014b). The USDA Forest Service, Southwestern Region, and the Sacramento Grazing Association (Permittee) signed a Joint Proposal for Completion of Work in the Rio Peñasco Area on the Sacramento Allotment related to the NMMJM [New Mexico Meadow Jumping Mouse] (Agreement) on October 1, 2016, after several site visits and meetings to modify the proposed action for the 2016 grazing year (Appendix A). The Forest Service submitted an amended BA on September 30, 2016, based primarily on the terms of the Agreement. The Service hereby incorporates the BA, BA Amendment, and the Agreement by reference. References cited in this BO are not a complete bibliography of all literature available on the jumping mouse. A complete administrative record of this consultation is on file at this office.

BIOLOGICAL OPINION

Description of the action area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR section 402.02). In delineating the action area, we evaluated the furthest reaching physical, chemical, and biotic effects of the action on the environment. For this consultation, we have defined the action area as lands within the Sacramento Grazing Allotment, Lincoln National Forest, New Mexico, including lands used for existing and proposed livestock enclosures, and livestock traps.

DESCRIPTION OF THE PROPOSED ACTION

The proposed action for this consultation is the continuation of ongoing livestock grazing as authorized through the Term Grazing Permits for the Sacramento Allotment on the Lincoln National Forest for the next three years. The Forest Service reviews and validates the term grazing permit on the Sacramento Allotment through an annual operating plan for the life of the permit. The life of the consultation extends until the term grazing permit expires on December 31, 2018. However, the permit may be renewed upon expiration under the same terms and conditions and for the full term of the expired or waived permit. The current utilization standards for grazing include conservative use of forage based on the range conditions with the exception of livestock traps, which may experience use levels up to 70 percent. Utilization standards are determined using the stubble height method. The minimum stubble height measurement that is acceptable for key species range from 10.1 centimeters (cm) (4 inches (in)) for most grasses, 15.2 cm (6 in) for fescues, and 20.3 cm (8 in) for riparian vegetation.

Sacramento Allotment: The Sacramento Allotment contains 45,116 hectares (111,484 acres) of National Forest System lands and the elevation ranges from 1,371 to 2,956 meters (4,500 to 9,700 feet). The allotment consists of summer and winter pastures that have vegetation types such as mixed-conifer forest (e.g. white fir (*Abies concolor*), Douglas fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), oak (*Quercus* spp.), aspen (*Populus* spp.), pinyon-juniper woodlands, and desert shrublands along with various forbs and grasses. Riparian vegetation occurs along seeps, springs, and perennial streams within the allotment.

The Sacramento Allotment is composed of a summer and winter range (Table 2). The summer range consists of four pastures: North, South, Atkinson, and Nelson that are authorized for variable stocking from 200 to 412 cow/calf pairs from May 15 to October 31 and five horses from March 1 to February 28 (year-round). This also includes two traps: Rio Penasco and Wills Trap. Partial numbers of livestock may be allowed to enter the summer range prior to May 15 and after May 1 only when key forage species meet the range readiness criteria (2.54 cm (1 in) of new growth on Kentucky bluegrass). The maximum allowable forage utilization for all key areas on the summer range is 35 percent.

Ongoing Livestock Grazing: The Forest Service implements the grazing strategy for the allotment by using management prescriptions that are identified in the most current National Environment Policy Act (NEPA) document (USFS 2004). The Forest Service manages ongoing grazing within the allotment through Allotment Management Plans (USFS 2008), with adjustments that will protect jumping mouse occupied habitat and designated critical habitat from Forest Service regulated use.

The winter range also consists of four pastures: Alamo, Mule, Pasture Ridge, and Grapevine. The permittee grazes Alamo, Pasture Ridge, and Grapevine Pastures annually with 200 to 335 cow/calf pairs and 5 horses from November 1 to May 14. The maximum allowable forage utilization for all key areas on the winter range is 35 percent.

Table 2. The amount of acres associated with each pasture in the Sacramento Allotment.

Pasture	Total Hectares	Total Acres
Summer Range		
North Pasture (Formerly Benson)	6,755	16,692
South Pasture (Formerly Wills)	10,626	26,257
Atkinson	613	1,515
Wills Canyon Trap	38	94
Nelson	4,166	10,205
Total Summer Range	21,930	54,190
Winter Range		
Mule (Formerly Burleson)	4,666	11,531
Alamo	4,610	11,391
Grapevine	5,959	14,724
Pasture Ridge	7,507	18,551
Total Winter Range	23,186	57,294
Total Sacramento Allotment	45,116	111,484

Livestock use has not been assigned to the Mule Pasture for decades due to the non-functional water sources. Non-use of the Mule Pasture will continue until the water sources are functional and contain enough water to support livestock.

Livestock are managed by fencing, herding, salting, supplementing, and use of other water sources to disperse the livestock throughout the allotment. North and South Pastures are grazed simultaneously during the summer season. Grazing is not authorized in the enclosures located within the Sacramento Allotment. For example, the Forest Service constructed several enclosures throughout the allotment to protect threatened populations of thistle and to protect riparian habitat. The Forest Service administratively removed these enclosures from the Sacramento Allotment for the Sacramento Mountain thistle.

Additional Management Measures

- 1) Install temporary enclosures in Wills and Rio Peñasco canyons, reconstructing existing livestock traps with associated handling facilities in Wills Canyon and Wright Spring, and constructing a new livestock trap and associated handling facility in Atkinson Canyon. No heavy equipment or any sort of vehicle will be used in jumping mouse habitat. Limited personnel will stay out of habitat as much as possible during installation. The temporary enclosures will consist of electric wire, plastic stakes and a few t-posts (corner post).
- 2) Maintain temporary and existing enclosures for the jumping mouse. No heavy equipment or any sort of vehicle will be used in habitat. Personnel will stay out of habitat as much as possible during maintenance.

- 3) Grazing on all acres of jumping mouse habitat outside of exclosures, including the Rio Peñasco and Wills Traps, will be limited to 35 percent maximum utilization. Based on the October 1, 2016, Agreement, the Forest Service will remove the Rio Peñasco temporary exclosure (Peñasco Trap) for 2016 to allow the permittee to process the herd for shipping and movement to winter pastures (Figure 1). This will occur after October 10, 2016. The Forest Service will re-install the exclosure in the spring prior to May 14, 2017, and before livestock move into the summer pastures. Jumping mouse habitat monitoring protocols will be implemented to determine if agency action (e.g., fencing) is needed for additional protection of jumping mouse. This protocol will combine various monitoring methods used to capture information on a variety of attributes, such as ground cover, plant utilization, frequency, species identification, soil moisture, etc. If utilization is exceeded, the Forest Service will contact the Service to discuss whether reinitiation of consultation with the Service will be needed.
- 4) The Wright Spring, Atkinson livestock traps, and associated handling facilities will be authorized for a utilization of greater than 70 percent. Neither of these traps occurs in jumping mouse habitat. However, the Atkinson livestock trap is located in Mexican spotted owl foraging habitat near the Atkinson Protected Activity Center.
- 5) Beginning in 2017, and annually thereafter, the Forest Service will conduct jumping mouse inventory surveys to locate additional populations using standardized survey protocols. If surveys result in the identification of additional populations, the Forest Service will consider protective measures with any need for reinitiation or further NEPA analysis.
- 6) Compliance checks will be conducted throughout the summer on handling facilities and permanent and temporary exclosures within jumping mouse habitat.
- 7) Forest Service personnel will perform compliance checks weekly throughout the grazing seasons to ensure that incursions of excluded riparian areas and closed grazing pastures within designated critical habitat are detected quickly and reported to the Service and permittee within 24 hours of detection. Included with the notification would be remedial measures being taken. Additional checks will be performed when incursions are detected to ensure permittees remove livestock from exclosures and closed grazing pastures. These checks will be documented in the project record and provided to the Service after each grazing season. If livestock are found within the excluded riparian and areas closed to grazing, they will be reported to the permittee who will be instructed to remove the livestock and comply with the terms of the term grazing permit within 72 hours of official notification.
- 8) Effects of livestock incursions will be assessed using the Landscape Appearance Method (Bureau of Land Management (BLM) 1999) within 72 hours after livestock removal and the results of the assessment (i.e. landscape appearance utilization class) will be reported to the Service, within 24 hours of assessment.
- 9) If allocated take is exceeded, the Forest Service will contact the Service within 72 hours of the assessment, to discuss if reinitiation of formal consultation is warranted and plan

any emergency remedial action if necessary. Deviations from the proposed action that lead to livestock incursions into restricted areas will result in informal consultations with the Service to determine whether reinitiation of formal consultation is warranted.

Rio Peñasco Canyon:

- 1) In April/May, small groups of up to 40 head will be trailed through Rio Peñasco enclosure to the Rio Peñasco Trap on County Road C17; livestock will not be authorized within the Enclosure for more than 24 hours or in a Trap for more than 48 hours within a two week designated period.
- 2) Livestock use, within Rio Peñasco Trap, will be limited to the area outside of electric fence except during the two-week designated period. The Forest Service will assess impacts to critical habitat prior to the removal of the electric fence and after the livestock have been processed and shipped or moved to the winter pastures.
- 3) As many livestock as practicable will be worked at other existing facilities on the Winter Range prior to entry onto the Summer Range (e.g., the new Atkinson Trap).
- 4) There may be instances throughout the summer months (April/May-October) when sick or injured livestock (five to 10 head) may need to be placed temporarily in the Rio Peñasco Trap. Livestock will not be authorized to stay within the trap for more than 48 hours. Close communication between Forest Service and permittee will be necessary to ensure compliance.
- 5) In October, livestock (up to 200 cow/calf pairs in 2016) will be moved through the Rio Peñasco Trap (reverse of how they enter the Rio Peñasco/similar to how they come on in April/May) and livestock will be sorted into shippers and keepers. Shippers will be within the corral and small trap to south of corral and held for up to 12 days, when they will be removed by a shipping truck. Livestock will be shipped as quickly as possible for sale depending on weather conditions, change in the date of sale by the buyer, or any other unforeseen circumstances. All of the keepers will either be shipped or pushed to the winter pastures.
- 6) Once the new facility in Atkinson is constructed, as many livestock as practicable will be worked there to alleviate pressure within jumping mouse critical habitat and Sacramento Mountains thistle habitat.
- 7) In 2016, all electric fences east of the corral in the Rio Peñasco Trap will be removed the first week in October prior to roundup and shipping. The electric fences west of the corral will be realigned and narrowed with a 200-foot (60.1-meter) water gap. The realigned and narrowed enclosure will incorporate approximately 2.7 acres (1.1 hectares).
- 8) Livestock grazing impacts will not be measured by utilization but the condition of jumping mouse critical habitat primary constituent elements after the livestock are removed.

October to be processed for shipping. All others are pushed through the Wills Canyon to the Sacramento River to Winter Range. The working facility at Wright Spring in the Pasture Ridge pasture will be reconstructed to reduce the pressure within the Wills Canyon Trap.

- 4) There may be instances throughout the summer months (April/May-October) when sick or injured livestock (five-10 head) may need to be placed temporarily in the Wills Canyon Trap. Livestock will not be authorized to stay within the trap for more than 48 hours. Close communication between Forest Service and permittee will be necessary to ensure compliance.
- 5) The Forest Service established two study plots (40 ft. x 40 ft.) in Wills Canyon. The plots are designed to exclude not only livestock, but also elk and deer from the sites. These are to measure any differences in vegetation height due to grazing or non-grazing by elk and to measure any differences in stream bank stabilization using photograph points and visual obstruction readings using fence poles or a Robel pole. The Forest Service will also assess vegetation species composition in photographs to determine changes to the community based on varied levels of grazing pressure over time.
- 6) The previous authorized 70% maximum utilization for Wills Canyon trap and handling facilities will now adhere to 35% maximum utilization.
- 7) Forest Service personnel will perform compliance checks weekly throughout the grazing seasons to ensure that incursions of excluded riparian areas and closed grazing pastures within designated critical habitat are detected quickly and reported to the Service and permittee within 24 hours of detection. Included with the notification would be remedial measures being taken. Additional checks will be performed when incursions are detected to ensure permittees remove livestock from enclosures and closed grazing pastures. These checks will be documented in the project record and provided to the Service after each grazing season. If livestock are found within the excluded riparian and areas closed to grazing, they will be reported to the permittee who will be instructed to remove the livestock and comply with the terms of the term grazing permit within 72 hours of official notification.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND ADVERSE MODIFICATION DETERMINATIONS

Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this BO relies on four components in our evaluation for each species: (1) the Status of the Species, which evaluates the species' range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the Effects of the Action, which

determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and, (4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the species' current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The jeopardy analysis in this BO places an emphasis on consideration of the range-wide survival and recovery needs of the species and the role of the action area in the survival and recovery of the species as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Adverse Modification Determination

In accordance with policy and regulation, the adverse modification analysis in this BO relies on four components: 1) the Status of Designated Critical Habitat, which evaluates the range-wide condition of designated critical habitat for the species in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended recovery function of the designated critical habitat overall; 2) the Environmental Baseline, which evaluates the condition of the designated critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; 3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how they will influence the recovery role of affected designated critical habitat units; and, 4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the PCEs, and how they will influence the recovery role of affected designated critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the designated critical habitat are evaluated in the context of the condition of the designated critical habitat unit, taking into account any cumulative effects, to determine if the designated critical habitat unit would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the species.

STATUS OF SPECIES/DESIGNATED CRITICAL HABITAT

Mexican Spotted Owl

In 1993, the Service listed the Mexican spotted owl (hereafter, referred to as Mexican spotted owl, spotted owl, and owl) as threatened under the Act. The Service appointed the Mexican spotted owl Recovery Team in 1993 (Service 1993), which produced the Recovery Plan for the

Mexican spotted owl in 1995 (Service 1995). The Service released the final Mexican Spotted Owl Recovery Plan, First Revision (Recovery Plan) in December 2012 (Service 2012a). Critical habitat was designated for the spotted owl in 2004 (Service 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 (Service 1993), the original Recovery Plan (Service 1995), and in the revised Recovery Plan (Service 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 (Gutierrez 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 canyon lands. 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 first revision of the Recovery Plan, we renamed RUs as "Ecological Management Units" (EMUs) to be in accord with current Service 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 revised Recovery Plan (Service 2012a) 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 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 (Service 2012a). However, we do assume that an increase in the number of areas considered occupied is a positive indicator regarding owl abundance.

The Southwestern Region of the Forest Service is currently conducting population monitoring recommended in the Recovery Plan, First Revision (Service 2012a). The effort to conduct this work began during the 2014 breeding season, continued in the 2015 breeding season, and has commenced for the 2016 breeding season. The recommended population monitoring is occurring only on National Forest System (NFS) lands at this time. The Forest Service and the Bird Conservancy of the Rockies (formerly the Rocky Mountain Bird Observatory, contractor) are continuing to collect data and cooperatively develop a strategy with the Recovery Team 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 Bird Conservancy of the Rockies, we have a process for conducting rangewide population monitoring, but we need to further develop the potential strategy for collecting rangewide habitat monitoring data.

Two primary reasons were cited for listing 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 impacts associated with stand-replacing fire were also cited as a looming threat at that time. Since publication of the original Recovery Plan (Service 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 (Service 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 (Service 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 domestic livestock 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. Although, use of sites near heavy recreational use and successful breeding and fledging are indications the owls can acclimate to this type of activity. 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 rangewide.

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. Although owls will forage in burned areas and, at times, nest and successfully fledge (Personal Communication, Larry Cordova, Wildlife Biologist, Smokey Bear Ranger District, Lincoln National Forest), the long-term effects to roosting and nesting habitat by stand-replacing wildfire is unknown.

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 3.5 million hectares (8.6 million acres) of Federal lands in Arizona, Colorado, New Mexico, and Utah (Service 2004). Within the designated boundaries, critical habitat includes only those areas defined as protected and restricted habitats in the 1995 Mexican Spotted Owl Recovery Plan (Service 1995). Protected habitat is defined as Protected Activity Centers (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 all legally and administratively reserved lands (e.g., wilderness). Restricted habitat is defined as all other mixed conifer, pine-oak (except those pine-oak stands in the Southern Rocky Mountain Recovery Units and the Colorado Plateau Recovery Unit outside of New Mexico), and riparian forests not falling within PACs or slopes greater than 40 percent (Service 1995). The 2012 Mexican Spotted Owl Recovery Plan, First Revision (Service 2012a) describes unoccupied protected habitat and all restricted habitat as “Recovery Habitat,” no longer using the term restricted to describe foraging, dispersal, and future nest/roost habitat. The 2012 Recovery Plan also removes administratively reserved lands and steep slopes from automatic inclusion as protected areas. The PCEs for Mexican spotted owl critical habitat were determined from studies of their habitat requirements and information provided in the 1995 Recovery Plan (Service 1995). Since owl habitat can include both canyon and forested areas (Service 2004; 2012a), 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 (1.4 m or 4.5 feet above ground) of 30.5 cm (12 in) 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 30.5 cm (12 in).
- 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 listed above usually are present with increasing forest age, but their occurrence may vary by location, past forest management practices or natural disturbance events, forest-type productivity, and plant succession. These 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 two kilometers (1.2 miles) in width (from rim to rim), with canyon reaches often two kilometers (1.2 miles) 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 BO for the Coconino NF (Service 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.

Sacramento Mountains Thistle

The thistle was listed as a threatened species on June 16, 1987, without critical habitat (52 FR 22933). A recovery plan was completed in 1993 (Service 1993a). The thistle is also listed as a New Mexico State endangered plant species under Title 19, Chapter 21, Part 2 of the New Mexico Administrative Code (NMAC 2010). The New Mexico Forestry Division is the issuing agency and as directed under the statutory authority of NMSA 1978 Section 75-6-1, is responsible for prohibiting the taking, possession, transportation and exportation, and selling or offering for sale any listed plant species (EMNRD undated).

Life history

The thistle is a monocarpic, short-lived perennial initially forming robust rosettes of spiny leaves that live for one or more years as juvenile plants (Burks 1994). Each rosette eventually bolts a

flowering stem, spends a single growing season as a reproductive individual, and dies upon seed set. Mature plants reach 1.0 to 1.8 meters (m) (3.3 to 5.9 feet) tall and have stems that are brown-purple and highly branched. Basal leaves are green, 30.5 to 50.8 cm (12 to 20 inches) long, and up to 8 inches wide, with ragged edges. Flowering occurs only once from late June through August, when pink-purple flower heads form at the tips of stems (75 FR 30757). Seed production usually occurs from cross-pollination, although this species is capable of reproducing asexually, using genetic material from a single individual to produce a clone. Pollen is carried by a variety of animal vectors including several species of native bees, flies, butterflies, and hummingbirds (Griswold 1990; Tepedino 2002).

Habitat

The thistle is a wetland-obligate species generally confined to travertine deposits on springs and seeps, along streams in meadows or forest margins, and in water-saturated alkaline soils in open valley bottoms. These sites are rich in calcium carbonate from limestone that often precipitates out to create areas of travertine, which occasionally become large bluffs or hills. Suitable thistle habitats are relatively rare, spotty in distribution, and range in size from five square meters (m^2)(6 yards²) to several 1,000 m^2 (1,196 ft²). Within these habitats, thistles occur in small, dense groupings (Service 2005). Occupied habitats occur in relatively close proximity such that they may be sufficiently connected genetically to form one or more metapopulations (Burks 1994).

The extent of occupied sites and plant numbers fluctuate with rainfall conditions and available surface water. Plants are most abundant at sites with water available at or just below the surface. Water flow fluctuates with rainfall patterns from year to year and is believed to be re-channeled as passages are cemented in naturally with travertine deposits. This causes the flows to migrate back and forth across travertine slopes that are hundreds of years old (USFS 2003b).

Distribution and Abundance

The thistle occurs within the mixed-conifer zone between 2,286 to 2,804 m (7,500 to 9,200 feet) elevations. Occupied sites occur at springs, primarily in montane meadows and partly shaded forested areas in six large canyon drainages on the eastern slopes of the Sacramento Mountains. Only a few occupied sites occur on the western slope. More than 95 percent of known thistle sites occur on the Lincoln National Forest. The known geographic range of this species extends from about 6 miles northeast to about 27.4 km (17 miles) south of Cloudcroft in an area of about 388.5 square kilometers (150 square miles)(Service 1993b, 2010). There are two additional thistle sites near the southern boundary of the Mescalero Apache Reservation, and one known site on a private property seep in Fresno Canyon that is visible from State Highway 82. The extent of thistle habitat on private property inholdings within the Lincoln National Forest is unknown.

The Forest Service catalogs thistle occurrences as habitat locations or sites. In 1987, the thistle was known to occur in 20 populations in an approximately 388.5-square kilometer (150-square mile) area near the Village of Cloudcroft. This initial determination was based on an assessment

of discrete patches of thistles that were thought to experience little gene flow between occupied sites because of geographic distance. Subsequent discoveries of several additional patches of thistles between these ‘populations’ and observations of seed dispersal by stream flows have significantly reduced the number of thistle patches that could conform to the traditional biological definition of a population (Craddock and Huenneke 1997). These thistle groups more likely represent subpopulations.

Since 1987, however, newly occupied sites have been documented on the Lincoln National Forest. In 1993, 62 habitat sites were identified, with 58 of those on Forest Service land (Service 1993a). In 1995, 77 habitat sites were known on the Lincoln National Forest (Service 2004b). By 2005 and 2007, the Lincoln National Forest cataloged 104 extant, historic, or potential thistle sites. Of these, the Forest Service has monitored 83 sites since 1995 (Service 2010b). However, most of these sites are subdivisions of the original 20 ‘populations’ (Barlow-Irick 2007). Some sites are sporadically occupied by a few plants during wet years, and unoccupied or dormant during droughts (Barker, USFS pers. comm., 2006). Therefore, the 104 thistle sites identified by the Lincoln National Forest cannot be meaningfully compared numerically to the original 20 populations identified in 1987.

In another attempt to estimate the number of plants, the Service and the Lincoln National Forest estimated total population numbers of Sacramento Mountains thistles based on a 1995 adopted monitoring protocol of multiplying the number of flowering individuals by 10 to account for the numerous juvenile rosettes (USFS 2003a). This multiplier of 10 was based upon a 1989 count of all rosettes in 4 thistle patches, which found that flowering individuals ranged from 10 to 13 percent of the rosettes (Thomson 1991). However, because this protocol relied on a very limited sample in a single year, it likely does not provide an accurate estimate for the entire population in any given year. In 1995, and between 1998 and 2007, inventories for the thistle were based on standardized survey methods. These inventories counted only the number of flowering stems, rather than all age classes at most of the Lincoln National Forest locations known at the time and are the most accurate and consistent data available for the species.

Based on these data, there is an overall declining trend in the number of bolting (flowering) stems (Barlow-Irick 2007). Barlow-Irick (2007) documented a 30% decline in flowering stems from 1995 to 2007. Surveys for thistles were not conducted in 2009, 2010, or 2011. While most thistle patches have decreased in number of flowering stems during the monitoring period, a few sites have increased in stem numbers (Barlow-Irick 2007). Additionally, between 1998 and 2007, the thistle has been extirpated from seven sites.

Threats

Threats to the thistle include impacts from grazing, drought, water extraction, noxious weeds, insect predation, and recreation.

Livestock grazing

The thistle occurs on four grazing allotments on the Lincoln National Forest. Livestock grazing is the prevailing land use throughout the range of the thistle. Consumption and trampling of the thistle as well as hoof damage to travertine continue in areas with unmaintained or inadequate fencing. Threats from livestock include direct impacts such as herbivory, damage to vulnerable seedlings, rosettes and flowering stalks, as well as trampling damage to travertine and soft substrates (Thomson 1991, USFS 1994).

Drought

Because the thistle is a riparian species requiring surface or immediate sub-surface water flows, loss of water has resulted in a reduction of the number of individuals or caused a loss of all plants at previously occupied sites (USFS 2003b). Water loss in thistle habitat may occur both naturally and because of human impacts. Examples of naturally occurring water loss include changes in precipitation patterns and watershed condition, as well as shifts in travertine deposits and slopes (USFS 2003b).

January to August 2011 was the driest precipitation period ever recorded (National Weather Service 2011). Water flow at a number of springs occupied by the thistle has declined substantially. Monsoonal summer precipitation can be very patchy, with some areas receiving considerably less rainfall than others. Monitoring has shown that when water flow declines at springs, decreases in plant numbers and the size of occurrences have occurred (Huenneke, 1996). When increased water is available, the opposite has been observed (USFS 2003b). It is likely that the seasonal distribution of yearly precipitation also plays a role in water availability for the species (73 FR 66003).

Water Extraction

Appropriation of water rights from springs curtails the natural surface flows, and thus may negatively affect the thistle. Water diversion by roads, trails, and spring development are examples of loss of water flow to occupied sites due to human activity (USFS 2003b). Additionally, the listing rule described an unauthorized 1,900-foot long pipeline and cement spring box constructed at a thistle site, which negatively impacted nearby plants by impeding water flow (52 FR 22933). This unauthorized development of a spring near Bluff Springs resulted in an 84 percent loss of thistles, from 300 plants in 1984 to 47 plants in 1991 (Service 1993). Water diversions have increased with the growing population in south-central New Mexico (Office of the State Engineer 2003). The development of additional water rights will likely dewater thistle water sources in the foreseeable future.

Noxious weeds

Noxious weeds have invaded a number of thistle sites and pose a threat to the species. Decreased natural water flows at travertine springs create conditions that favor invasion of weeds such as teasel (*Dipsacus sylvestris*), musk thistle (*Carduus nutans*), and bull thistle (*Cirsium*

vulgare) (USFS 2003b). These weeds cannot tolerate the continuously saturated substrates that are typical in thistle patches on spring habitats. However, as soils dry, these plants have encroached in thistle habitat (Huenneke and Thomson 1995).

Insect Predation

The exotic seed-head weevil (*Rhinocyllus conicus*) was documented within thistle sites during 2006. *Rhinocyllus conicus* attacks native thistles and decreases their seed production (Dodge 2005). For example, in the Silver Springs area, the weevil used about 65 percent of thistle flower heads, causing damage to the plant (Sivinski 2008). The stem borer weevil (*Lixus pervestitus*) also has been found within the Silver Springs thistle population, resulting in a significant loss of seed production since 2006 (Sivinski 2007, 2008). *Lixus pervestitus* causes premature stem death and reproductive blooms can be virtually non-existent. Sivinski (2008) studied insect seed predation and herbivory of *C. vinaceum* in September of 2006, 2007, and 2008 in four populations: Silver Springs, Bluff Springs, Upper Rio Peñasco, and Scott Able Canyon. These insect species damaged flower heads or caused premature stem death in all years of the study and predation continues.

Recreation

Recreational impacts are occurring within areas of high visitation, such as Bluff Springs. The majority of the Bluff Springs population has been closed to foot traffic by building a fence around the travertine bluff feature. The Forest Service has routed trails around this population. Other thistle sites are also occasionally impacted by off-road vehicle traffic (Service 1993).

Additional Information

In April 2004 and in August 2007, the County of Otero petitioned us to remove the thistle from the list of endangered species. A not substantial 90-day finding was published on December 5, 2006 (71 FR 70479). As part of the 90-day finding, we announced the initiation of the 5-year status review. In 2008, we published a substantial 90-day finding in response to the second petition (73 FR 66003). Following a 12-month review, we published a not warranted finding, indicating the species still meets the definition of threatened based on continuing threats, limited range, and recent downward population trend (75 FR 30757). The 5-year status review provides additional information on the species and is available: <http://ecos.fws.gov/ecos/indexPublic.doi>.

New Mexico Meadow Jumping Mouse

The jumping mouse was proposed as an endangered species with critical habitat on June 20, 2013 (78 FR 37363; 78 FR 37328). On June 10, 2014, the jumping mouse was listed as endangered (Service 2014a). Final designated critical habitat was published on March 16, 2016 (Service 2016). In addition to the summary information provided below, we completed a species status assessment report (SSA Report) for the jumping mouse in May 2014, which is hereby incorporated by reference (Service 2014b). A Recovery Outline was also completed concurrent with the final rule listing the species as endangered (Service 2014c). The SSA

Report provides a thorough assessment of jumping mouse biology and natural history and assesses demographic risks (such as small population sizes), threats, and limiting factors in the context of determining viability and risk of extinction for the species. In the SSA Report, we also compile biological data and a description of past, present, and likely future threats (causes and effects) facing the jumping mouse.

The jumping mouse is a small mammal whose historical distribution likely included riparian wetlands along streams in the Sangre de Cristo and San Juan Mountains from southern Colorado to central New Mexico, including the Jemez and Sacramento Mountains and the Rio Grande Valley from Española to Bosque del Apache National Wildlife Refuge, and into parts of the White Mountains in eastern Arizona.

The jumping mouse life history (short active period, short life span, low fecundity, specific habitat needs, and low dispersal ability) makes populations highly vulnerable to extirpations when habitat is lost and fragmented. Based on historical (1980s and 1990s) and current (from 2005 to 2014) data, the distribution and abundance of the jumping mouse has declined significantly range-wide. The majority of extirpations have occurred since the late 1980s to early 1990s, as we found about 70 formerly occupied locations are now considered extirpated. Since 2005, there have been 31 documented remaining populations spread across the 8 conservation areas (2 in Colorado, 15 in New Mexico, and 14 in Arizona). Nearly all of the current populations are isolated and widely separated, and all of the 31 populations located since 2005 have patches of suitable habitat that are too small to support resilient populations of jumping mice. In addition, 11 of the 31 populations documented since 2005 have been substantially compromised since 2011 (due to water shortages, grazing, or wildfire and post-fire flooding), and these populations could already be extirpated (see Service 2014a for a detailed discussion).

Because the jumping mouse requires such specific suitable habitat conditions, populations have a high potential for extirpation when habitat is altered or eliminated. We found that there has been a significant reduction in occupied localities likely due to cumulative habitat loss and fragmentation across the range of the jumping mouse. The past and current habitat loss has resulted in the extirpation of historical populations, reduced the size of existing populations, and isolated existing small populations. Ongoing and future habitat loss is expected to result in additional extirpations of more populations. The primary sources of past and future habitat losses are from grazing pressure (which removes the needed vegetation) and water management and use (which causes vegetation loss from mowing and drying of soils), lack of water due to drought (exacerbated by climate change), and wildfires (also exacerbated by climate change). Additional sources of habitat loss are likely to occur from scouring floods, loss of beaver ponds, highway reconstruction, residential and commercial development, coalbed methane development, and unregulated recreation.

ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the effects of the action on federally listed species, the Service is required to take into consideration the environmental baseline.

Regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impacts of State and private actions that are contemporaneous with the consultation in progress.

History of Grazing on the Sacramento Allotment

Between 1981 and 1989, the Sacramento Allotment was either lightly stocked (see *Forest Guardians v. United States Forest Service, et. al.*, CIV 00-490 JP/RLP 2002; USFS 2004c) or was vacant (1983-1987) (USFS 1987). As a result, improvement of range conditions occurred until 1991. However, from 1991 until 2004, the Allotment was stocked with 553 cattle (cow/calf pairs), a level that was determined to exceed the Allotment forage capacity (Galt and Holechek 1998). Galt and Holechek (1998) recommended a rest-rotation on the winter and summer pastures, but if both pastures were used at the same time, extensive herding would be needed. During this period, range conditions became significantly degraded on the winter unit (Galt and Holechek 1998).

Two studies completed in 1996 and 1998 determined that stocking levels exceeded the Allotment grazing capacity (Kaufman et al. 1998; Forest Service 2003a). Grazing levels were set without considering forage production or the number of elk on the allotment. The 1996 study reported that excessive forage use was occurring in riparian zones and concluded that the Forest Plan guidelines were being exceeded, particularly in riparian zones. The decline in the quality of vegetation and soil conditions was caused by overutilization (*Forest Guardians v. United States Forest Service, et. al.*, CIV 00-490 JP/RLP 2002). These historic impacts from livestock continue to cause significant soil loss and modification of habitat.

By 2003-2004, stocking rates in the winter units were reduced to a range of 200-335 cow/calf pairs in order to align with the Allotment grazing capacity (USFS 2004c). An Allotment Management Plan (AMP) was developed in 2006, but the permittee refused to sign the document (USFS 2006a). It is unclear whether the AMP was ever implemented. To our knowledge, a new Allotment Management Plan for the current 2009 permit has not been developed.

Range and Riparian Conditions

Due to the rugged and steep topography of the Sacramento Allotment, livestock grazing is restricted to canyon bottoms, ridge tops, open grasslands, and along roads (USFS 2004c). Dominant forage species on the summer range include Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), intermediate wheatgrass (*Thinopyrum intermedium*), and orchardgrass (*Dactylis glomerata*). Dominant species on the winter pastures include blue grama (*Bouteloua gracilis*), sideoats grama (*Bouteloua curtipendula*), Sand muhly (*Muhlenbergia arenicola*), wolf tail (*Pennisetum glaucum*), and plains lovegrass (*Eragrostis intermedia*).

Many areas in the Sacramento Allotment have experienced varying degrees of erosion and vegetation changes due to past livestock management practices (USFS 2003c). Reduction in grasses and forbs by tree and shrub invasion and overutilization resulted in a loss of and decline in the quality of vegetation cover and an increase in soil loss (*Forest Guardians v. United States Forest Service, et. al., CIV 00-490 JP/RLP 2002*; USFS 2003b). Without adequate vegetative cover or litter, extensive loss of soils in the winter pastures continues (USFS 2004c, 2011d, Service 2011).

In 2004, the Forest reported that more than 90 percent of the riparian areas associated with perennial streams in the Sacramento Allotment were in poor condition (USFS 2004c). Streams on the summer range that are located in the Rio Penasco and Sacramento River Watersheds have incised channels isolated from the floodplain with unstable banks and high width-to-depth ratios. In 1999, a Proper Functioning Condition (PFC) Assessment occurred for several stream reaches and their associated riparian communities in Caballero Canyon on the winter range, and the Upper Rio Peñasco, Water Canyon, Wills Canyon, and Hubbell Canyon on the summer range. Although specifics were not provided, twelve reaches were identified as properly functioning with conditions that could withstand a 25-30 year flood event; fourteen were identified as functional but at risk, and one was identified as nonfunctional. Eighteen of the 27 reaches assessed had vegetation grazed too closely, with trampled banks, leading to the potential for decreased root strength and bank stability. Fourteen of the reaches did not have sufficient vegetation to protect bank stability during large floods. The deferred rest-rotation strategy on the summer range was expected to slowly improve range conditions; however, this strategy was only followed for two years before the Forest Service changed to a 6-month continuous seasonal-long grazing in 2006, which is now the proposed action.

From 1991 through 2006, forage utilization in most key areas on the summer range averaged between 70-81 percent (USFS 2003c). Forage utilization rates on the winter range have been irregularly monitored. In 1994 and 1995, forage use levels in the Alamo Pasture were observed to be between 50 and 70 percent (USFS 1994; USFS 1995). Galt and Holechek (1998) noted that a lack of old vegetation litter to protect soil was problematic on the winter range, with watershed degradation the biggest concern. From 2005-2010, the average percent vegetation litter at key areas has generally remained low: Upper Alamo 16 percent (range 1-38), Lower Alamo 6 percent (range 0-19), and Caballero 15 percent (range 1-44) (USFS 2006, 2007d, 2009a, 2010d, 2010e).

Monitoring at the end of the 2010 grazing season estimated forage utilization in Upper Alamo Canyon to be 53 percent, whereas at the end of the 2011 season Alamo and Caballero Canyons were estimated to be 79 and 76 percent, respectively (USFS 2010d, 2011c). These data were collected immediately following the grazing seasons and, particularly in 2011, far exceeded the permitted guideline of 45 percent. Moreover, measured stubble height data collected mid-season (March 3-5, 2010) within Upper Alamo and Caballero averaged 2.9 and 3.6 inches of measured stubble height, respectively (USDA Forest Service 2010e), which exceed the minimum stubble height guideline of 4 inches.

Monitoring using stubble height data indicates utilization for the 2011-2015 grazing years averaged greater than 50% in key areas of the allotment with a downward trend (USDA Forest Service 2012, 2013, 2015).

Cattle and Elk Competition

Elk use in the Sacramento Allotment is year-round, but seasonal movements across the Sacramento drainage occurs primarily during the spring and fall, depending on snow levels (USDA Forest Service 2004c). The Forest Service installed two study plots in Wills Canyon: one within the permanent livestock exclosures (Mauldin Exclosures) and one outside of the livestock exclosure. The Forest Service used the study plots to compare utilization by elk and deer only, livestock, deer, and elk together, with areas that were not exposed to ungulate grazing. There was no discernable difference between areas not grazed and those available to elk and deer grazing only. Significant utilization was apparent between wild ungulate grazed and those areas open to grazing by all wild and domestic grazers (Personal communication, Jack D. Williams, District Biologist, October 6, 2016).

The Forest Service changed to continuous seasonal-long grazing in 2006 as a strategy to distribute livestock and elk evenly within the summer range (USFS 2006). This strategy has not helped ameliorate long-term range degradation because the permitted forage utilization is still regularly exceeded, e.g., the average across key areas was 59.6% in 2015, 54% in 2013, 51% in 2012 (USFS 2012, 2013, 2015).

Drought

New Mexico has experienced a long-term drought since 1999. The Sacramento Mountains experienced extremely dry winters from 2005 to spring 2006, winter 2007 to spring 2008, and from winter 2010 to summer 2011. Notably, the extremely dry conditions in spring 2008 and spring/summer 2011 forced the closure of the entire Lincoln National Forest to the public. Drought will likely be a continuing factor affecting the action area in the foreseeable future. In fact, the National Weather Service (2011) predicted that the current drought would persist or intensify through 2011. Precipitation levels in the Sacramento Mountains have remained below average in recent years, and most recently have experienced a severe drought from February through March 2016. Near average precipitation fell in during 2016 (<http://droughtmonitor.unl.edu/>, accessed October 10, 2016).

History of the Sacramento Allotment and the Endangered Species Act

The Forest Service issued a 10-year term grazing permit for the Sacramento Allotment to the Sacramento Grazing Association (SGA) on November 27, 1989. That permit expired on November 27, 1999, and the agency issued a new 10-year term grazing permit to the SGA on November 23, 1999, authorizing 553 cow/calf pairs on the Sacramento Allotment, but the Forest Service did not request consultation. In 2000, Forest Guardians filed suit against the agency alleging that the issuance of the 1999 permit resulted in overgrazing and harm to the Mexican spotted owl and that the agency violated the Act's consultation requirements, National Forest

Management Act, and the Administrative Procedures Act. The Forest Service requested consultation on the Sacramento and Dry Canyon Allotments in November 2000 to analyze the effects of grazing 200-412 cow/calf pairs for a three-year period or until NEPA was completed.

The District Court filed judgment in April 2003 against the Forest Service and the Service for violating the consultation requirements under section 7 of the Act by failing to consult on the entire 10-year permit regarding the effects on the Mexican spotted owl from the issuance of the 1999 term grazing permit. We completed formal consultation in 2004. When the Forest Service modified the proposed action in 2006, they requested reinitiation of the consultation. The Forest Service notified us on August 4, 2010, that a new term grazing permit was issued on November 11, 2009, and is active until December 2018. The Forest Service stated that this is the first permit issued under the Record of Decision for the Sacramento Allotment.

Mexican Spotted Owl

Status of the Species and Designated Critical Habitat within the Action Area

The Lincoln National Forest is within the Basin and Range - East (BR-E) EMU. This EMU is an important source population for other areas (Service 1995, 2012a). Mexican spotted owls here occur in isolated mountain ranges scattered across the region, the largest portion occurring in the Sacramento Mountains. In this EMU, Mexican spotted owls have been reported on Forest Service lands in the Sandia, Manzano, Sacramento, and Guadalupe Mountains, and in Guadalupe National Park, Carlsbad Caverns National Park, and the Mescalero Apache Reservation. Mexican spotted owls are most common in mixed-conifer forest, but have been found in ponderosa pine forest and piñon/juniper woodland (Skaggs and Raitt 1988, Service 1995).

There are 199 PACs within the Basin and Range East EMU, with 148 PACs on the Lincoln National Forest. The Sacramento Ranger District has 117 PACs; the Guadalupe Ranger District has 10 PACs; and the Smokey Bear Ranger District has 22 PACs. Additional PACs are located on the Mescalero Apache Reservation (37 PACs), the Guadalupe Mountains National Park (11 PACs), and the Cibola National Forest (3 PACs).

Major threats to the Mexican spotted owl, in order of potential effects, include: 1) catastrophic, stand-replacement fires, 2) some forms of timber harvest, 3) fuelwood harvest, 4) grazing, 5) agriculture or development for human habitation, and 6) forest insects and disease (Service 1995; Service 2012a). Minor threats include: 1) certain military operations, 2) other habitat alterations (e.g. power line and road construction, noxious weed control), 3) mining, and 4) recreation. Minor threats are activities not currently extensive in time or space but are potential threats to the Mexican spotted owl.

The dominant land uses within the EMU include timber management, fuels management, and livestock grazing (Service 2012a). Recreational activities such as off-road driving, skiing, hiking, camping, and hunting are locally common within the RU (Service 1995, 2012a).

Past and present Federal, State, private, and other human activities that have undergone informal consultation and conferencing and may affect the Mexican spotted owl and its habitat are as follows: The Hay and Scott Able timber sales, Bridge salvage sale, Walker fire salvage sale, Wildland Urban Interface projects, livestock grazing, recreational activities, recreation and scenic vista developments, road construction, maintenance activities, land exchanges, right-of-way issuances, off-road motorcycle events, power line construction, wildlife research projects, urban development, and catastrophic wildfires, their suppression and rehabilitation activities.

The likelihood of Mexican spotted owls occurring within the action area is very high. Monitoring of the Mexican spotted owl by the Forest Service between 1987 and 2002 has been mostly informal and not consistent between years or among PACs. Still, we received Mexican spotted owl monitoring information in 2010 covering the period from 2002 to 2009. Occupancy was confirmed in 43 PACs, including Hubbell (2003-2009), Lightning (2006-2009), Rice (2004, 2009), and Zoo (2003-2009). The Service received additional information in 2016 for the Radio Tower (2005-2015), Wilmeth (2007-2015), Bluff Springs (2005-2011), Dark (2006-2010), Lightning (2006-2012), and the Hubble (2005-2010) PACs. Occupancy varied, but the Wilmeth, Bluff Springs, Lightning, and Hubble PACs were consistently occupied. Despite confirmation of occupancy, we consider Mexican spotted owl PACs within the action area to be occupied regardless of available survey data. This is consistent with the Recovery Plan's recommendation for the retention of PACs, the potential of mature survival to reach 16 years or more, and high site fidelity (Service 1995).

There are 46 PACs within the Sacramento Allotment. Forty-four PACs are located within the summer range and two PACs, the Joplin and Law-Andres PACs, are located within the Mule Pasture of the winter range. The Zoo PAC is located within the Natural Resource Area, an area of 259 hectares (640 acres) that is within the Nelson summer pasture. Only a sliver of the Bear Spring, Hidden, and Rio PACs are within the Sacramento Allotment boundary, whereas the majority of the PACs are located within a neighboring allotment. Occupied Mexican spotted owl habitat on the Sacramento Allotment is 9,455 hectares (23,363 acres) (USFS 2004c).

The majority of the vegetative community on in the summer range is mixed-conifer forest (approximately 8,094 hectares, or 20,010 acres) (Ward 2001; USFS 2004c). These mesic woodlands occur above 2,280 meters (7,480 feet) and are dominated by Douglas-fir (*Pseudotsuga menziesii*) or white fir (*Abies concolor*) on slopes of 16-40 percent and ridgetops. Other communities on the summer range include stands of quaking aspen (*Populus tremloides*) (approximately 287 hectares, or 708 acres) which occur on 0-40 percent slope and montane meadow grasslands (approximately 285 hectares, or 705 acres) that occur along canyon bottoms above 2,103 meters (6,900 feet) elevation. Montane meadows, which include montane grasslands and wet meadows, are dominated by the sod-bound, low producing form of Kentucky bluegrass (*Poa pratensis*) (Ward 2001; USFS 2006a). Pinyon-juniper and ponderosa pine dominated communities also occur on the winter range.

Factors Affecting the Species within the Action Area

Since consultation on the Mexican spotted owl and its designated critical habitat was finalized in 2004, a limited amount of new information has been provided, but has focused on analyses of effects to the Sacramento prickly poppy and the Sacramento Mountain thistle in the winter pastures of the Sacramento Allotment. Other sources of information, including prior consultations, Lincoln National Forest status reports, or published research, were used to better understand on-the-ground conditions from 2006 to present.

Vegetation in the Sacramento Allotment has been substantially altered over the past century by extensive logging, livestock grazing, agriculture, and water extraction (Ward 2001; USFS 2004c). Natural fire frequencies have been suppressed and fire has been absent in many stands for 60 to 100 years, resulting in changes to the composition of plant communities (at higher elevations, aspen are a successional stage which change to fir/spruce communities, e.g.), increased tree densities, and changes to the microclimate (Ward 2001).

All PACs are subjected to some form of disturbance, such as livestock grazing, road maintenance, trail maintenance, and utility line maintenance that has likely resulted in short-term disturbance to the Mexican spotted owls and has impacted habitat that support prey species. Grazing occurs in all but ten PACs (USFS 2003b). Some PACs also receive moderate to heavy use by recreational activities associated with Forest Service roads and trails that traverse either around, through, or near the PAC. These activities include winter snow recreation, hiking, camping, hunting, mountain biking, and motorized trail use (OHV).

Forage utilization levels in meadow habitat has been exceeded regularly since 2001 (USFS 2007a, 2010f, 2012, 2013, 2015). The Forest Service did not complete an analysis on the effects of continued seasonal grazing on the Mexican spotted owl and its designated critical habitat. The Forest Service stated in their 2006 BA that their effect determination from the 2003 BA remained unchanged (USFS 2006). In addition, the agency stopped conducting prey base monitoring and implemented forage utilization monitoring, using residual stubble height as the metric for measuring prey habitat quality and suitability for Mexican spotted owls.

Past impacts to Mexican spotted owl critical habitat include defoliation of mixed-conifer and aspen forest communities by insect outbreaks to ponderosa pine (USFS 2007a). Defoliation was first observed in 2002 in the Rio Peñasco and Wills Canyons east of the Sunspot observatory, with subsequent defoliation observed each year. The Sacramento Ranger District reported an outbreak of New Mexico fir looper resulted in defoliation of the mixed conifer forest affecting 2,394 ha (5,915 acres) in 2004 and 2,143 ha (5,295) acres in 2005. The western spruce budworm also caused defoliation of approximately 283 ha (700 acres) but the Ranger District reported that no defoliation by the insect was visible during the aerial surveys in 2005. On September 5, 2007, the Lincoln National Forest Supervisor signed a finding of no significant impact authorizing aerial spraying to suppress the New Mexico fir looper (*Nepytia janetae*) winter conifer defoliation. Approximately 1,788 ha (4,419 acres) of NFS lands around the Village of Cloudcroft, New Mexico, was treated in November 2007 using the biological insecticide *Bacillus thuringiensis* var. *kurstaki* (*Btk*). Aspen defoliation caused by the western tent caterpillar was

minor, but increased to 204 ha (505 acres) in 2005 from 42.5 ha (105 acres) in 2004 (USFS 2006). Bark-beetle-caused tree mortality occurred on 4,925 hectares (12,170 acres) in 2006, down from 7,960 hectares (19,670 acres) in 2005. Lastly, ponderosa-pine mortality was observed on 870 hectares (2,150 acres) and fir mortality on approximately 4,047 hectares (10,000 acres) in 2005 compared to 6,874 hectares (16,985 acres) in 2005. Fir mortality in the mixed conifer (caused by fir engraver beetles) caused the increase in overall bark beetle activity. The Lincoln National Forest reported that this was the greatest amount of fir mortality observed in the past 10 years (USFS 2006).

On April 8, 2009, we consulted on the effects of the Sacramento Mountains Defoliation Project on the Mexican spotted owl and its designated critical habitat. The Forest Service determined that the project was “not likely to adversely affect” the species and its designated critical habitat but we disagreed with the determination and issued a BO. We determined that commercial harvesting of dead conifer trees, caused by four conifer tree defoliating insects, including a looper species, *Nepytia janetae*, would not non-jeopardize the continued existence of the species or adversely modify its designated critical habitat (Consultation 22420-2009-F-0011).

In the 2004 BO for this allotment, we issued incidental take in the form of harassment for two Mexican spotted owl pairs and their young associated with the Hubbell and Bluff Springs PACs for ongoing loss of Mexican spotted owl prey habitat. One of the Terms and Conditions was to provide a report documenting how the project is in compliance with the proposed action. The Forest Service had in addition, proposed to create two new key areas inside these PACs to monitor utilization rates and determine whether adequate prey cover was being provided. The Forest Service reported in their 2006 and 2007 biological assessments that this has not been initiated (USFS 2006; 2007a). However, there are currently key areas established adjacent to or near the Thunder, Lightning, April, and Bear Springs PACs.

Sacramento Mountains Thistle

Status of the Species within the Action Area

The Sacramento Allotment contains the majority of the known thistle populations. When this species was listed as threatened in 1987, its range was thought to consist of approximately 20 known population areas containing an estimated 10,000-15,000 sexually reproducing individuals (52 FR 22934). It is believed that more than 95 percent of the known populations occur on the Lincoln National Forest. However, it is difficult to accurately assess population numbers because these plants are capable of spreading by adventitious roots. Also, some sites are sporadically occupied by individuals during wet years and unoccupied or dormant during periods of drought. Over the years, numerous accounting techniques have been used in an attempt to assess population numbers; however, the most accurate population data collections were made from 1998 to the present. These collection efforts utilized a standard method of counting only the number of flowering stems rather than all age classes. These data suggest that thistle population levels are declining (Service 2010, Roth 2013). In fact, out of 61 previously documented thistle sites, only 43 of those sites still contained live plants (Roth 2013). In 2008, the Lincoln National Forest experienced heavier than average seasonal monsoons, triggered by

Hurricane Dolly, which led to severe flooding events within the Scott Able Canyon. As a result of the flooding, most of the thistle populations located in the lower portion of Scott Able Canyon was eliminated (J. Williams, pers. comm.). Additional surveys have been conducted within the Wills and Rio Peñasco canyons in 2014 and 2015.

Factors Affecting the Species within the Action Area

Factors affecting the thistle in the action area include livestock grazing, drought and water extraction, recreation, and insect predation.

Livestock Grazing

The vast majority of known thistle individuals are located in the Sacramento Allotment. Using a combination of historic and current population data, approximately 16,030 individual thistles are located within the Sacramento Allotment. Of those, approximately 37 percent are accessible by livestock, while 63 percent are inaccessible to livestock because of topographic barriers or they reside in an enclosure. District-wide, an estimated 30 percent of Sacramento Mountains individual thistles are currently accessible to livestock, while an estimated 70 percent are inaccessible.

To control herbivory and trampling within the Sacramento Allotment, the Forest Service has maintained 23 enclosures around thistle sites, covering approximately 290 acres. These enclosures have protected 23.5 percent of the known occupied thistle habitat in the allotment. Thistle numbers can rebound substantially when they are fenced. For example, thistle numbers in Hubble Canyon increased from no plants in 1984, when an enclosure was built, to about 500 plants in 1991 (USFS 2003b). Enclosures require constant vigilance and work; livestock have routinely been observed in enclosures of the Sacramento Allotment due to unmaintained fencing, including the 2011 summer season. Since 2006, many instances of livestock presence within thistle enclosures were noted on summer range (USFS 2003b, 2007a, Barlow-Irick 2008). The Forest Service believes all of their enclosures on the Sacramento Allotment are effective, and they will be doing compliance checks at least 2 to 3 days each week, along with any needed maintenance, while cows are on the summer pastures.

Thistles occur in the North (Newman, Benson, Lucas, and Dark canyons) and South (Water and Brown canyons) summer pastures, the Atkinson pastures, the Alamo Watershed, the Peñasco Trap, and in the following enclosures: Bluff Spring, Hubbell, Peñasco, and Wills Canyon. The North, South, and Atkinson pastures are all summer pastures; therefore the grazing regime will be the same for all three. The current term grazing permit authorizes 200 to 412 cow-calf pairs within the summer pastures between April and October. Grazing is not authorized in the enclosures located within the allotment, which have been administratively removed from the allotment. All acres of mouse habitat outside of the enclosures will be grazed to 35 percent maximum utilization, and this also applies to thistle habitat where these overlap. The allotment contains a large trap that was previously authorized for 70 percent utilization, but will now be dropped to 35 percent maximum utilization. In addition, two new enclosures will protect approximately 20 additional acres of occupied thistle habitat in the Rio Peñasco trap, including

an additional 0.3 acres in Water Canyon. However, the Peñasco trap electric fence will be removed for two weeks at the end of October 2016 to process livestock.

Drought and Water Extraction

Water flow at a number of springs occupied by the thistle has declined substantially since 2004. There have been no additional special use permits issued by the Forest Service for diversion of water from thistle habitats since this species was listed as threatened in 1987 (Barker, personal communication, 2006). Several thistle habitats have been subjected to direct and indirect impacts from land uses that damage travertine substrates and hydrological characteristics. In 2001 and 2002, a riparian improvement project in Water Canyon and the Rio Penasco improved drainage under roads. This action has increased water availability in formerly occupied habitat, allowing the thistle to reoccupy these sites (Service 2005).

Recreation

Recreational impacts to Sacramento Mountains thistles have occurred at the Bluff Springs locality (Service 1993, Service 2008, Barlow-Irick 2008, USFS 2008b, Service 2010). Fencing around thistles in this area has been maintained and foot trails rerouted to protect this population (USFS 2003b). After construction of the fence in 1983, thistles rebounded. Recreationalists have also been observed driving OHVs through other exclosures typically fenced to exclude livestock (USFS 2008b).

Insect Predation

Sivinski (2007, 2008) documented insect seed predation and herbivory of the thistle in late summer within four thistle population zones: Silver Springs, Bluff Springs, Upper Rio Penasco, and Scott Able Canyon. Four native and one introduced insect species damaged flower heads or caused premature stem death of the thistle (Sivinski 2007, 2008). The flower head and seed predators were: 1) a native, specialist tephritid gall fly (*Paracantha gentilis*); 2) a native pterophorid artichoke plume moth (*Platyptilia carduidactyla*); 3) a native, generalist scarabaeid bumble flower beetle (*Euphoria inda*); and 4) an introduced curculionid flower head weevil (*Rhinocyllus conicus*) (Sivinski 2007). The fifth insect predator, the native curculionid stem borer weevil, *Lixus pervestitus*, was also observed (Sivinski 2007, 2008). In September, 2007, these insect predators damaged up to 80 percent of the Bluff Springs population; up to 66 percent in the Upper Rio Penasco population; and 90 percent of the Scott Able Canyon population (Sivinski 2007). Although thistle rosettes can reproduce asexually from rhizomes, seed production from insect attack was significantly reduced, particularly as a result of the stem boring weevil (Sivinski 2007, 2008).

New Mexico Meadow Jumping Mouse

Status of the Species and Designated Critical Habitat within the Action Area

In combination with other factors, livestock grazing has contributed to altering many ecosystem functions and processes associated with this allotment, resulting in the fragmentation and isolation of jumping mouse habitat. Current livestock numbers and management of the allotment has resulted in altered herbaceous riparian vegetation and reduced development of grass seed heads; both are necessary to provide cover from predators and food for the jumping mouse. This situation has resulted in adverse effects to jumping mice by reducing the amount of suitable habitat and the number of extant populations. Drought likely has a major influence on the status and distribution of the jumping mouse because the reduction of water has reduced the amount of suitable habitat available (Frey 2005; Frey and Malaney 2009). As precipitation decreases, surface water retreats and the adjacent soils become drier and unable to support the herbaceous riparian vegetation required by the jumping mouse. Nevertheless, no livestock management changes have been enacted or proposed to manage jumping mouse habitat through years of drought.

The SSA Report for the jumping mouse includes information on the status of the species in the action area (Service 2014b). In 2005, the New Mexico meadow jumping mouse was captured at two localities within the Sacramento Mountains in southern New Mexico, Otero County (Frey 2005a). In 2010, the jumping mouse continued to occupy at least one of the 2005 localities (Forest Service 2010). In 2012, the subspecies was detected at two additional sites (Forest Service 2012h). It is unlikely that the jumping mouse is currently present throughout each stream segment where the four localities occur because continuous suitable habitat, which would otherwise provide for foraging, active season movements, and genetic exchange, is lacking.

Cox Canyon and Rio Peñasco, Sacramento Mountains, Lincoln National Forest, Otero County. Based on surveys and museum records from 1988 to 2012 and recent visual surveys, much of the habitat was thought to be historically occupied (Morrison 1989 pp. 7–10, Frey 2005a, pp. 32–33; Forest Service 2012h, entire; Service 2012d). In 2005, surveys were conducted in some areas of the Rio Peñasco, but no jumping mice were captured; however, some short stream segments contain suitable habitat (Frey 2005a, pp. 19–20, 32–34). In 2012, two jumping mice were captured at the intersection of Cox Canyon and the Rio Peñasco where the dominant plant was spikerush, soil moisture was high, and there was visible flowing water within 6.1 m (20 ft) of the site (Forest Service 2012a, entire; 2012c, entire; 2012h, pp. 2–3).

Mauldin Spring, Wills Canyon, Sacramento Mountains, Lincoln National Forest, Otero County. In 2012, one jumping mouse was captured at Lower Mauldin Spring within a grazing enclosure with permanent flowing water that contained primarily redtop (*Agrostis alba*), *Poa* spp., sedges (*Carex* spp.), and cutleaf coneflower (Forest Service 2012b, entire; 2012c, entire; 2012h, pp. 2–5). In 2013, another jumping mouse was captured at Upper Mauldin Spring within a grazing enclosure with permanent flowing water (Forest Service 2013a, entire). Based on surveys and museum records from 1988 to 2013 and recent visual surveys, we think much

of the habitat was historically occupied (Morrison 1989, pp. 7–10; Frey 2005a, pp. 9, 34; Forest Service 2012a, entire; 2012h, p. 2–5; 2013a, entire; Service 2012d, pp. 2, 8). The two small segments within the livestock enclosures are considered occupied; however, it is unknown whether the jumping mouse persists throughout Will Canyon downstream of the springs.

Designated Critical Habitat

Designated critical habitat within the action area includes a portion of Unit 4. Unit 4 consists of 777 ha (1,920 ac) along 36.2 km (22.5 mi) of streams within five subunits on private lands and areas managed by the Forest Service within Otero County, New Mexico. Areas designated as critical habitat for the jumping mouse in this unit incorporate the only habitat known to be occupied by the species since 2005 within the Sacramento Mountains with the capability to support the breeding and reproduction of the species. Designated critical habitat in the action area consists of riparian and upland areas associated with current (since 2005) and historical documentation of individual jumping mice along the Rio Penasco (Unit 4B) and Wills Canyon (Unit 4D). Within the action area, there are 31 hectares (77 acres) of occupied designated critical habitat and 183 hectares (453 acres) of unoccupied designated critical habitat on the Forest Service excluding private land inholdings that is deemed suitable for jumping mouse and that contains the PCEs. Occupied habitat was calculated by delineating an area 0.8 km (0.5 mi) upstream and downstream from 2005 and 2006 capture locations and 100 m (328.1 ft.) each side of the water's edge.

Subunit 4B; Upper Penasco

This subunit begins at the junction of Forest Service Road 164 and New Mexico Highway 6563 and follows the Rio Peñasco drainage downstream to about 2.4 km (1.5 mi) below Bluff Spring at the boundary of private and Forest Service lands. Although much of the habitat was historically occupied with individuals detected as recently as 1988 (Morrison 1989 pp. 7–10, Frey 2005a, pp. 30–31), no jumping mice were captured during surveys in 2005 (Frey 2005a, pp. 19–20, 32–34). Therefore, we evaluated the area as if it was unoccupied, and have determined that it is important for the subspecies to provide connectivity to additional suitable habitat and allow for possible reintroduction of jumping mice populations within the Upper Rio Peñasco drainage into historically occupied habitat. This subunit contains perennial flowing water with saturated soils and has a high potential of being restored to suitable habitat. This subunit also contains the highest elevation historic population in the Sacramento Mountains and is located at the headwaters of the Rio Peñasco watershed, suggesting it may be less prone to wildfire and flooding than other areas. Because there has only been one population of the jumping mouse found since 2005 in the Rio Peñasco drainage with limited suitable habitat.

Subunit 4D; Wills Canyon

This subunit begins at upper Mauldin Spring, the head of the Wills Canyon, and follows the drainage downstream about 5.6 km (3.5 mi) along Forest Service Road 169 to the boundary of

Forest Service and private lands in the vicinity of Bear Spring. The stream segment surrounding the 2012 and 2013 capture locations is considered occupied (Forest Service 2012a, entire; 2012h, p. 2–5; 2013a, entire; Service 2012d, pp. 2, 8); however, it is unknown whether the jumping mouse persists throughout the remaining almost 5.6 km (3.5 mi) of the Wills Canyon downstream. The downstream segment does not currently contain suitable habitat, but has perennial flowing water with saturated soils (Frey 2005a, p. 34) and a high potential of being restored to suitable habitat. Therefore, we evaluated the segment downstream of the 2012 and 2013 capture locations as if it was unoccupied. Because there has only been one population of the jumping mouse found since 2005 in the Wills Canyon drainage with limited suitable habitat of 1.7 ha (4.15 ac) (Forest Service 2012a, entire; 2012h, p. 2–5; 2013a, entire; Service 2012d, pp. 2, 8), additional populations are needed to provide connectivity and expand jumping mouse populations throughout the drainage. Consequently, we also evaluated whether to include the stream section downstream of Bear Spring, the possible terminus of the subunit, to include the entire Wills Canyon drainage downstream where it joins the middle Rio Peñasco Subunit. This additional stream section would provide further connectivity to occupied habitat within the Wills Canyon Subunit and increase the length and size of the area by connecting to the occupied habitat within the middle Rio Peñasco Subunit. However, this additional stream segment, from Bear Spring downstream to the Rio Peñasco, is not perennial and does not contain suitable habitat (Frey 2005a, p. 31). Without seasonally available water, suitable habitat is unlikely to be restored, and therefore, this downstream segment cannot support a population of jumping mouse nor enhance viability of subspecies in this geographic management area. For these reasons, we limited the Wills Canyon Subunit to 5.6 km (3.5 mi), which would augment the current size and connectivity of suitable habitat to increase the distribution of the jumping mouse in the Sacramento Mountains and provide population redundancy and resiliency.

Within these areas, the primary constituent elements of the physical or biological features essential to the conservation of the New Mexico meadow jumping mouse consist of the following:

- (i) Riparian communities along rivers and streams, springs and wetlands, or canals and ditches that contain:
 - (A) Persistent emergent herbaceous wetlands especially characterized by presence of primarily forbs and sedges (*Carex* spp. or *Schoenoplectus pungens*); or
 - (B) Scrub-shrub riparian areas that are dominated by willows (*Salix* spp.) or alders (*Alnus* spp.) with an understory of primarily forbs and sedges; and
- (ii) Flowing water that provides saturated soils throughout the New Mexico meadow jumping mouse's active season that supports tall (average stubble height of herbaceous vegetation of at least 61 cm (24 in) and dense herbaceous riparian vegetation composed primarily of sedges (*Carex* spp. or *Schoenoplectus pungens*) and forbs, including, but not limited to one or more of the following associated species: spikerush (*Eleocharis macrostachya*), beaked sedge (*Carex rostrata*), rushes (*Juncus* spp. and *Scirpus* spp.), and numerous species of grasses such as

bluegrass (*Poa* spp.), slender wheatgrass (*Elymus trachycaulus*), brome (*Bromus* spp.), foxtail barley (*Hordeum jubatum*), or Japanese brome (*Bromus japonicas*), and forbs such as water hemlock (*Circuta douglasii*), field mint (*Mentha arvensis*), asters (*Aster* spp.), or cutleaf coneflower (*Rudbeckia laciniata*); and

- (iii) Sufficient areas of 9 to 24 km (5.6 to 15 mi) along a stream, ditch, or canal that contain suitable or restorable habitat to support movements of individual New Mexico meadow jumping mice; and
- (iv) Adjacent floodplain and upland areas extending approximately 100 m (330 ft) outward from the boundary between the active water channel and the floodplain (as defined by the bankfull stage of streams) or from the top edge of the ditch or canal.

Critical habitat does not include manmade structures (such as buildings, fire lookout stations, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on April 15, 2016.

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

Mexican Spotted Owl

This section includes an analysis of the direct and indirect effects of the proposed action on the species and its interrelated and interdependent activities. The effects of livestock grazing on Mexican spotted owl prey populations and their habitats are extraordinarily complex. The discussion below outlines the current information we have on Mexican spotted owl-prey relationships and the current knowledge of the effects of grazing on Mexican spotted owl and their habitat.

Although the effects of livestock and wild ungulate grazing on the habitat of Mexican spotted owl prey species is a complex issue, there exists some knowledge regarding the effects of livestock grazing. Investigators identified significant effects to mesic and montane plant communities occupied by small mammals that are consumed frequently by Mexican spotted owls (Ward and Block 1995; Ward 2001). For example, Szaro (1991) examined the effects of grazing in New Mexico within livestock enclosures compared to areas continuously grazed. Greater numbers and more species of small mammals were captured in the enclosure compared to the grazed areas. Schultz and Leininger (1990) examined effects of cattle exclusion along a riparian community in Colorado. Deer mice were significantly more abundant in grazed areas (65%

utilization) and western jumping mice were significantly more abundant in ungrazed areas. Further, long-tailed and mountain voles were not observed in grazed areas. Other studies have shown similar results: lack of a numerical decrease by deer mice following grazing (Reynolds 1980), and significant decrease in voles caused by grazing induced by loss of cover in mesic habitats (Grant et al. 1982).

Impacts can vary according to grazing species; degree of use, including numbers of grazers, grazing intensity, grazing frequency, and timing of grazing; habitat type and structure; and plant or prey species composition (Service 1995). Vegetation cover is often greatly reduced on grazed relative to ungrazed areas, and vegetation typically appears more dense in ungrazed areas (e.g., see Belsky and Blumenthal 1997). Because Mexican spotted owl eat primarily small mammals, obligate herbivores are the most likely to experience adverse effects from grazing. Rodents, especially voles, are vulnerable to grazing impacts because they rely on grasses and forbs for food and cover. The proposed action includes conservative grazing utilization for the allotment which should promote and maintain good to excellent range conditions over time if consistently implemented.

The Recovery Plan summarizes the effects of grazing to Mexican spotted owls in two categories: 1) those that result in relatively short-term effects requiring short recovery periods to restore suitable habitat characteristics; and, 2) those that result in long-term alterations in plant-species composition and vegetation structure. For example, properly managed grazing in key owl foraging areas that consistently maintains residual herbaceous biomass of forage species, sufficient to allow for individual plants to recover and reproduce during most growing seasons, should provide cover and food sources for some prey species (especially during drought periods). In contrast, grazing that allows for moderate- to high-intensity grazing throughout several successive growing seasons may result in impaired vegetation productivity and ultimate changes in species composition, density, and vigor, which can degrade spotted owl prey habitat characteristics over the long-term. In general, predicting the magnitude of grazing effects on Mexican spotted owls and their habitats requires a better understanding of the relationship between Mexican spotted owl habitat and grazing (Service 2012a).

The Recovery Plan postulates on the direct and indirect effects of both grazing by livestock and wildlife (e.g., elk, deer) (Service 2012). Grazing by domestic and wild ungulates is a potential threat to spotted owls when managed improperly. Improper grazing may affect prey species habitat (e.g., reducing herbaceous ground cover), nest/roost habitat (e.g., limiting regeneration of important tree species, especially in riparian areas), and the capacity for resource managers to restore and maintain conditions supporting natural fire regimes within an array of habitat types. Grazing by domestic and wild ungulates is common within most Mexican spotted owl habitat types. However, intensity is typically minimal in forested areas that meet the definition of protected, restricted, or recovery habitat. Meadows on gentler slopes or no slope at all within the broader forested types do receive higher use by grazing ungulates. This potential threat occurs throughout the owl's range and often during periods of its reproductive cycle when prey availability is most critical. The magnitude of the threat is greatly dependent on the duration, timing, and intensity of grazing, and if improperly managed, both short-term and long-term adverse effects on the owl's habitat and that of its prey species may occur (Service 2012).

To minimize these impacts, the Recovery Plan and 1996 amendment to the Forest Plan recommend that grazing by livestock and wildlife be monitored in key areas, including riparian areas, meadows, and oak types. Further recommendations focus on implementing and enforcing grazing utilization standards and guidelines that would attain good to excellent range conditions within the key grazing areas. To do this, the Recovery Plan and the amended Forest Plan incorporate allowable use levels based on current range condition, key species, and the type of grazing system. The management strategy of the amended Forest Plan is to restore good conditions to degraded riparian communities as soon as possible, and strive to attain good to excellent range conditions by implementing range-related standards and guidelines.

There are approximately 24,281 hectares (60,000 acres) of mixed conifer habitat within the Sacramento Allotment. There are 46 established PACs that have some portion within the Sacramento Allotment. Two are on the winter unit and the other 44 PACs are within the summer unit. Eleven of these 44 PACs have little or no grazing due to steep slopes, access and very little meadow habitat within the PACs. In general, these 11 PACs and other protected habitats would receive light forage use because of high canopy closure, multistoried conditions, and high basal area of woody species that limit understory production; and because of the association these areas have with steep slopes and distance from large meadows. The remaining 33, which are subject to cattle grazing, have differing amounts of meadow habitat, ranging from 0.4 to 39.3 ha (1 to 97 acres) per PAC (total 34.4 ha (805 acres) of meadows within PACs). Meadow habitat including riparian areas consist of 673.8 ha (1,665 acres) within the Sacramento Allotment, indicating that meadows within PACs make up a significant proportion of these areas (i.e., 325.8 out of 673.8 ha, or 805 out of 1,665 acres).

The proposed action is that the Forest Service will maintain the following range/forage guidelines on the Sacramento Allotment (i.e., the term grazing permit will be managed to ensure that the range conditions are not reduced below these minimum thresholds): 1) **herbaceous ground cover height**, which applies to both palatable and unpalatable species and is a standard that relates to the Forest Plan. Herbaceous ground cover height is proposed to be 10.2 cm (4 in) across the allotment; and 2) **forage utilization** is a percentage that indicates the difference between the amount of annual forage (i.e., as it applies to key palatable forage species) produced and consumed during the growing season. The Forest Service proposed forage utilization to be 35% for the summer and winter units, and 70% within the Wright Spring, Rio Peñasco, and proposed Atkinson livestock traps.

The Forest Service developed grazing criteria to assist in determining effects to the Mexican spotted owl and other species from ongoing grazing. Allotment management activities that must be met to make a determination of may affect, not likely to adversely affect for the Mexican spotted owl are:

1. In the action area, livestock grazing or livestock management activities will occur within PACs, but no human disturbance or construction actions associated with the livestock grazing will occur in PACs during the breeding season;

2. Livestock grazing and livestock management activities within PACs, in the action area, will be managed for levels that provide the woody and herbaceous vegetation necessary for cover for rodent prey species, the residual biomass that will support prescribed natural and ignited fires that would reduce the risk of catastrophic wildfire in the Forest, and regeneration of riparian trees; and
3. In Mexican spotted owl foraging areas, forage utilization will be maintained at conservative levels (i.e., between 30-40 percent of annual forage production by weight). Qualitative indicators of conservative use can be described by the following: forage plants have abundant seed stalks; areas more than a mile from water show little use; about one third to one half primary forage plants show grazing on key areas.

Proposed grazing actions that are inconsistent with the Forest Service's guidance criteria may adversely affect the Mexican spotted owl. We analyze the proposed action below by reviewing the Forest Service's grazing criteria, the Lincoln National Forest Plan (as amended), and the 2012 Recovery Plan.

Recovery Plan and Forest Plan Standards and Guidelines

In the following discussion, the grazing guidelines identified in the Recovery Plan are summarized (paragraphs numbered 1, 2, and 3) along with the Forest Plan standards and guidelines that address the intent of the Recovery Plan recommendations.

1. Monitor grazing use and livestock and wildlife in "key grazing areas" to detect changes in plant composition. The intent is to maintain good to excellent range conditions in key areas while accommodating the needs of the Mexican spotted owl and its prey.

The Forest Plan standards and guidelines for grazing management include identification of key ungulate forage monitoring areas. Within these areas, key species are to be selected to monitor average allowable use. The proposed action is consistent with the guidance to monitor key grazing areas. However, the Forest Service acknowledges in the BA that during periods of drought, these proposed forage/range guidelines may not be attained. We noted in the 2004 BO that good range conditions for some PACs might take years to achieve. This is still accurate. Recent and historical overgrazing may preclude range restoration for decades, even with strict compliance with forage/range guidelines. Moreover, the BA indicates that the proposed monitoring and permit administration procedures do not allow for adjustments to grazing levels until after forage/range guidelines have been exceeded. When forage/range guidelines are exceeded, adverse effects to Mexican spotted owl prey habitat will likely occur.

2. Implement and enforce grazing utilization standards that would attain good to excellent range conditions within the key grazing areas. Establish maximum allowable use levels that are conservative and that will expedite attaining and maintaining good to excellent range conditions. A primary purpose is to maintain and restore adequate levels of residual plant cover, fruits, seeds, and regeneration to provide for the needs of prey species and development of future Mexican spotted owl foraging and dispersal habitat.

Allowable use guidance for given range conditions and management strategies is provided in the Forest Plan standards and guidelines, with the provision that they be applied in the absence of more specific guidelines currently established through site specific NEPA analysis for individual allotments. Within the Sacramento Allotment, forage/range conditions and use levels were excessive from 1991 to 2005, and not consistent with the needs of long-term range management and the Mexican spotted owl. The BA indicates that monitoring of the winter pastures did not occur during 2004/2005. Similarly, during 2005, 2006, 2007, and 2010 forage use on key areas in the winter pastures exceeded the forage/range guidelines (USFS 2006, 2007a, 2007d, 2010f). The Service extrapolates a similar utilization level for key areas in Mexican spotted owl habitat in the summer pastures. This was confirmed through discussions with the district biologist (Personal communication, Jack Williams, District Biologist).

3. Implement management strategies that will restore good conditions to degraded riparian communities as soon as possible. Strategies may include reductions in grazing levels and increased numbers of exclosures to protect riparian plant cover and regeneration, and to prevent damage to streambanks and channels.

Currently, the ecological condition of the range within some Mexican spotted owl key areas is poor, and high forage use has led to soil instability and watershed degradation across much of the Sacramento Allotment (USFS 2004c). For example, a proper functioning condition evaluation was conducted on 27 stream reaches and associated riparian communities throughout the Sacramento Allotment. Most of the reaches (18 of 27) that were assessed had vegetation that had been grazed too closely, with banks trampled, and no vegetation to protect bank stability during large floods (USFS 2004c).

The Forest Service found that livestock and wildlife use within riparian areas would be high, and plant vigor and density would decline when the 35 percent forage use guideline is not met (USFS 2004c). Belsky and Blumenthal (1997) note that general livestock grazing can lead to compacted soils, which results in increased runoff and decreased water storage; and can also lead to increased erosion and runoff due to reduced plant cover and compacted soils. These factors, which lead to the degeneration of riparian plant communities and impair the ability of plant communities to develop into Mexican spotted owl habitat, are likely to continue if grazing utilization exceed the conservative use level in multiple years.

Grazing Criteria

Grazing criteria number 2 relates to managing forage levels within Mexican spotted owl occupied and critical habitat to provide residual woody and herbaceous vegetation necessary for prey habitat, and support prescribed natural and ignited fires. Under the forage/range guidelines of the proposed action, we believe the current proposed action will generally meet this criterion (the exception will be within livestock traps). When the Forest Service meets the range/forage guidelines, residual Mexican spotted owl prey habitat will be provided from the previous year. For example, the 65 percent residual forage amount, as determined by leaf length or other appropriate measurements, should provide adequate prey habitat during fall, winter, and spring

months. Alternatively, when the proposed herbaceous ground cover height and forage utilization standards are not met, adverse effects likely will occur to Mexican spotted owls and their prey habitat.

Grazing criteria number 3, identified above, relates to maintaining forage utilization at conservative levels from the onset of the summer rains or August 1 (whichever comes first) through the end of the grazing season on the summer pastures (the end of October). It is our understanding that no data currently exist on Mexican spotted owl prey habitat requirements for September and October, but during these months the proposed action is to apply the conservative forage utilization guidelines. Currently, the 35 percent forage utilization guideline for this allotment is based upon a 4 in leaf length for Kentucky bluegrass, and a 6 in leaf length for orchard grass and smooth brome.

The intent of the 1995 Recovery Plan is that the grazing guidelines should be applied year-round (Block 1998). If adequate habitat is not maintained during the plant dormant period (i.e., winter), prey species may be negatively impacted, reducing the Mexican spotted owl's prey base. Adverse effects to the Mexican spotted owl and its prey habitat will occur when these guidelines are not met.

The yearly stocking rate will be determined and specified in the annual operating instructions, which will include a variable stocking rate from 200 to 415 cattle and 5 horses during the summer and from 200 to 335 cattle and 5 horses during the winter. The annual stocking rate will be varied based upon forage production and utilization monitoring (i.e., implementation of the forage/range guidelines). Such revision could include, for example, seasons of use or numbers of livestock (36 CFR 222.4). The BA and subsequent discussions indicate that the Forest Service will monitor key areas to determine compliance with forage/range guidelines. They may take appropriate management action to achieve the guidelines in some years; otherwise, adverse impacts to the Mexican spotted owl and its habitat likely will occur.

Forage/range guidelines

We agreed with the Forest Service's conclusion that a downward trend in range condition can be expected from the current grazing pressure (USFS 2004c). They submitted monitoring data in the 2006 BA and again in December 2007. These data indicate that forage/range guidelines are still being exceeded in some areas within certain years (e.g., Benson, Kerr, Wills, and Lucas Canyons) and that current range conditions likely remain in poor condition. The information we reviewed indicate that the forage/range guidelines have been consistently exceeded across the Sacramento Allotment during 2005, 2006, 2007, 2010, 2012, 2013, and 2015 (USDA 2006, 2007a, 2007d, 2010f, 2012, 2013, 2015). The effects of heavy grazing have reduced herbaceous cover and grass/forb herbaceous ground cover height, likely resulting in a significant decrease in the number of voles within some PACs (Ward 2001). For these reasons, we conclude that some Mexican spotted owl PACs containing meadows that are within ½ mile of nest/roost areas may be adversely affected by use levels that exceed 35 percent.

A multitude of factors (e.g., weather patterns, fluctuating prey populations, etc.) influence the nesting success of the Mexican spotted owl and these factors change yearly, suggesting that the amount of foraging and protective cover a Mexican spotted owl may need on a given year may also change. It is possible that Mexican spotted owl pairs that lose a small amount of habitat within a 600-acre PAC are able to survive and successfully reproduce in good years or make up for this loss of habitat by foraging beyond the designated boundary of the PAC. However, the additional energy expenditure of foraging beyond PAC boundaries may reduce the likelihood of reproductive success. As a result, we are concerned about the condition of meadows within the Sacramento Allotment, and the possible effects on Mexican spotted owl prey habitat.

When forage utilization of 35 percent is met on the summer range, the Service believes it will provide adequate herbaceous habitat for prey species. If grazing, particularly in meadow areas within PACs (i.e., 5 to 16 percent of PACs), exceeds conservative use levels, the Service believes that habitat for Mexican spotted owl prey species may be adversely affected. The Forest Service acknowledges that rodent prey habitat may be affected if: 1) forage utilization is too high; 2) forage growing conditions are below what was expected in a given year; or 3) drought conditions persist. The Forest Service concludes that their proposed action may allow adverse effects to occur in Mexican spotted owl prey habitat because the 35 percent guideline could be exceeded during dry periods. We agree with their conclusion.

We identified six PACs within the Sacramento Allotment that contain greater than 50 ac of meadow habitat (Radio Tower, Wilmeth, Bluff Springs, Dark, Lightning, and Hubble). Although we do not have information on the range/forage conditions within four of these PACs (Radio Tower, Wilmeth, Dark, or Lightning), we believe that grazing in meadows can adversely affect breeding Mexican spotted owls when range/forage guidelines are not maintained because prey habitat is expected to be negatively affected.

In 2004, riparian conditions on the allotment did not meet Forest Service Regional criteria, the ecological condition of the range was not satisfactory, and many key areas did not meet or maintain leaf length, herbaceous ground cover height or utilization guidelines (USFS 2000d, 2001, 2002, 2002b, 2003a, 2003b, 2003c, 2003d). As noted above, during 2005, 2006, 2007, 2010, 2012, 2013, and 2015 forage use on key areas exceeded the forage/range guidelines (USFS 2006, 2007a, 2007d, 2010f, 2012, 2013, and 2015). As such, current range conditions across the allotment do not meet the intent of the Recovery Plan and the needs of the Mexican spotted owl.

When the forage/range utilization exceeds the maximum proposed use level, the amount of suitable Mexican spotted owl prey habitat may be reduced in the short term. Sustained exceedance over multiple seasons may result in long term alteration of spotted owl prey habitat. Although we believe that the current proposal has the potential to gradually improve the range/forage conditions within PACs, the current degraded conditions within some PACs, indicate that the range/forage condition levels may not be attained within the remaining years of the permit. If utilization levels persistently exceed 35 percent over multiple seasons, this could result in a significant portion of the prey habitat being lost or modified, disrupting normal behavior patterns such as breeding, sheltering, or feeding.

Interdependent and Interrelated Actions

We also must consider indirect effects and the effects of interdependent and interrelated actions of this proposed project to the Mexican spotted owl. Indirect effects are those that are caused by, or result from, the proposed action, and are later in time, but are reasonably certain to occur. Interrelated actions are actions that are part of a larger action, and are dependent on the larger action for their justification. Interdependent actions are actions that have no independent utility apart from the action under consideration. The allotment management activities include enclosures, livestock traps, and the use of salt blocks and other livestock management activities (e.g., vehicle use) and are considered interrelated and interdependent with the implementation of the proposed project. The Forest Service proposes 70% forage utilization standard for the Wright Spring, Rio Peñasco, and Atkinson livestock traps, which is double the proposed utilization across the allotment. We conclude that habitat for Mexican spotted owl prey would be diminished within livestock traps, and that this action may adversely affect foraging habitat for nearby PACs.

A new 75-acre livestock trap is proposed to be constructed in the Atkinson pasture. The Forest Service is proposing 70 percent forage utilization within the new livestock trap. As noted above, this high forage utilization is considered inconsistent with the recommendations in the Recovery Plan to maintain good to excellent grazing conditions. For this reason, we conclude that foraging habitat will likely be adversely affected.

Additional activities that concentrate cattle (trailing, gathering, and placement of waters, salt, and nutrient supplements) in occupied habitat during the Mexican spotted owl breeding season may affect individuals. Activities that concentrate livestock within PACs and/or riparian areas may result in localized impacts to prey habitat. Salt blocks placed within PACs or riparian areas is not likely to result in good to excellent range conditions within the key grazing areas or restore good conditions to degraded riparian communities as soon as possible. For this reason, we expect that Mexican spotted owls will likely be adversely affected by these activities.

The use of vehicles by permittees or Forest Service personnel is considered interrelated and interdependent with the implementation of the current proposed project. Effects related to these or other activities are considered incidental and should not be any greater than those described above, because the Forest Service will ensure that road use from vehicles will be kept to the existing roadbeds and pullouts. Consequently, the potential for effects from vehicle use, including OHVs, are expected to be limited and not likely to result in adverse effects.

Mexican spotted owl critical habitat

Under the current proposed action, we conclude that livestock grazing only has the potential to affect Mexican spotted owl critical habitat when grazing occurs within areas that contain the PCE of “adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.” Throughout this biological opinion we refer to this PCE as Mexican spotted owl prey habitat.

Similar to our findings in the final rule designating critical habitat for the Mexican spotted owl, we note that grazing usually does not occur within mixed conifer habitat because livestock generally remain within meadows or riparian areas (69 FR 53182). On the Lincoln National Forest, designated critical habitat is generally composed of mixed conifer (Service 1995). Thus, the majority of potential effects related to livestock grazing within designated Mexican spotted owl critical habitat will be insignificant and discountable, because high volumes of fallen trees and other woody debris in addition to the other primary constituent elements in forested habitats will not be substantially affected. Additionally, the habitat-based guidelines and definitions of protected and restricted habitat of the Mexican spotted owl 1995 Recovery Plan were utilized for our critical habitat designation and the previous consultations. Consequently, much of our previous analyses and conclusions are relevant to the current adverse modification analysis. Therefore, our analyses and conclusions detailed below are similar with regards to effects on protected and restricted areas and the PCE for Mexican spotted owl prey habitat.

The designation includes primary constituent elements related to canyon habitat, but this habitat type does not occur within the Sacramento Allotment or will be unaffected by livestock grazing activities. Therefore, we do not analyze the effects of livestock grazing activities on primary constituent elements within canyon habitat.

In general, critical habitat will receive light forage utilization because of high canopy closure, multistoried conditions, and high basal area of woody species that limit understory production; and because of the association these areas have with steep slopes and distance from large meadows. For these reasons, grazing within these areas is considered insignificant and discountable with regard to designated Mexican spotted owl critical habitat. Using information from previous BAs, we find that critical habitat on the Sacramento Allotment that has the potential to be adversely affected by the proposed action consists of meadow habitat and riparian areas totaling approximately 1,665 ac. Grazing above conservative use levels within designated critical habitat will adversely affect the PCE related to Mexican owl prey habitat, particularly within livestock traps with proposed utilization levels set at 70 percent.

Recovery Plan and Forest Plan Amendments

Our analyses and conclusions above apply equally to designated critical habitat. We find that parts of the proposed action are consistent with the grazing guidelines identified in the Recovery Plan and will thus minimize some, but not all, of the adverse effects to the relevant PCE of designated Mexican spotted owl critical habitat. We anticipate some adverse effects on the PCE relating to adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration. Nevertheless, the function and conservation role of this primary constituent element would not be compromised by the proposed action because, in general, the Forest has included forage and range guidelines to maintain Mexican spotted owl prey habitat. Moreover, we recognize that even if the PCE Mexican spotted owl prey habitat is temporarily affected in some areas, these impacts will be limited to scope.

Grazing Criteria

Under the forage/range guidelines of the proposed action, the Forest Service will monitor key areas. During 2005, 2006, 2007, 2010, 2012, 2013, and 2015 forage use on key areas exceeded the forage/range guidelines (USFS 2006, 2007a, 2007d, 2010f, 2012, 2013, and 2015). Although this process is designed to ensure compliance with the grazing criteria as they relate to designated Mexican spotted owl prey habitat (the exception will be within livestock traps), we anticipate that some adverse effects to the Mexican spotted owl prey habitat are likely to occur when this utilization guideline is exceeded. Nonetheless, we anticipate that the function and conservation role of the PCE Mexican spotted owl prey habitat would not be compromised by the proposed action because adverse effects will be limited in geographic scope and would not be expected to occur throughout the entire Mexican spotted owl habitat on the allotment.

Forage/range guidelines

We noted in previous BOs for the allotment that the range conditions are declining, and it is likely that some Mexican spotted owl critical habitat may be in poor condition. We continue to believe this information is accurate. These areas are considered critical habitat and include the PCE related to Mexican spotted owl prey habitat. The best scientific and commercial information consistently indicate that the forage/range guidelines have not been maintained on the Sacramento Allotment. During 2005, 2006, 2007, 2010, 2012, 2013, and 2015 forage use on key areas exceeded the forage/range guidelines (USDA 2006, 2007a, 2007d, 2010f, 2012, 2013, and 2015). When forage/range guidelines are exceeded, adverse effects to Mexican spotted owl prey habitat will continue to occur. We find that the PCE related to Mexican spotted owl prey habitat is currently being adversely affected in some areas.

We remain concerned about the condition of meadows within the Sacramento Allotment, and the possible effects on Mexican spotted owl prey habitat. This is especially significant because the proposed action allows adverse effects to Mexican spotted owl prey habitat if forage/range guidelines (e.g., 35 percent utilization) are exceeded during dry periods (USFS 2002, 2004c). We agree with this conclusion.

Information is available that indicates a conservative use level is regularly exceeded. These data also indicate that Mexican spotted owl critical habitat is currently being adversely affected. Consequently, we conclude that the amount of Mexican spotted owl prey habitat is currently reduced. Until the monitoring data indicate that the forage/range guidelines are met throughout the year, we conclude that adverse effects to the PCE related to Mexican spotted owl prey habitat will occur. We find that the effects to the function and conservation role of critical habitat relative to the EMU and the entire designation are not significant because the impacts are temporary and occur in a very small area relative to the Recovery Unit and the overall critical habitat designation. Therefore, we conclude that Mexican spotted owl critical habitat will serve the intended conservation role for species with implementation of the proposed action.

Interdependent and Interrelated Actions

The Forest Service concludes that Mexican spotted owl prey habitat would not be provided within livestock traps, and that the proposed 70 percent forage utilization would adversely affect designated critical habitat contained within livestock traps. We agree with the conclusion because the action is inconsistent with the recommendations in the Recovery Plan. Although 70 percent forage utilization within livestock traps may adversely affect designated critical habitat, we do not expect the effects to appreciably alter the function and conservation role of Mexican spotted owl critical habitat because the surrounding critical habitat will remain intact and provide adequate levels of Mexican spotted owl prey habitat.

The proposed livestock projects on the winter unit are not expected to affect Mexican spotted owl critical habitat because they are outside of protected and restricted habitat. Additional activities that concentrate cattle (trailing, gathering, and placement of waters, salt, and nutrient supplements) may be conducted within critical habitat (i.e., within some PACs). For example, salting is proposed and likely will occur within designated critical habitat. The Service believes this activity has the potential to concentrate livestock and result in adverse effects to the PCE related to Mexican spotted owl prey habitat in meadows and riparian areas. Utilization levels with these areas is not consistent with levels consistent with recommendations for attaining good to excellent range conditions within the key areas or to restore good conditions to degraded riparian communities as soon as possible. For this reason, we expect that the PCE related to Mexican spotted owl prey habitat will be adversely affected by these activities.

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 BO. 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. In past BOs, it has been stated that, “Because of predominant occurrences of the Mexican spotted owl on Federal lands, and because of the role of the respective Federal agencies in administering the habitat of the Mexican spotted owl, actions to be implemented in the future by non-Federal entities on non-Federal lands are considered of minor impact.” However, there has been a recent increase of harvest activities on non-Federal lands within the range of the Mexican spotted owl.

Future actions on non-Federal lands adjacent to the Forest within or adjacent to the project area that are reasonably expected to occur include livestock grazing, urban development, road construction, logging, fuelwood gathering, vegetation management (e.g., mowing or herbicide treatments), fuels management, fire suppression activities, wildland urban interface vegetative treatments, trail construction, and other associated actions. These activities reduce the quality and quantity of Mexican spotted owl nesting, roosting, and foraging habitat, cause disturbance to Mexican spotted owls and will contribute as cumulative effects to the proposed action.

The State of New Mexico manages wild ungulate populations within the action area. Grazing by wild ungulates contributes a significant amount of use of vegetation in the Sacramento

Allotment. However, the proposed action should consider the use of forage by wild ungulates in key areas. Therefore, this cumulative effect is already incorporated into the analysis.

Sacramento Mountains Thistle

Grazing practices in the Sacramento Allotment are sufficiently significant to influence the general status of the thistle because this allotment contains the majority of sites and individuals. In 2001, the Sacramento Grazing Allotment contained 74 of 86 occupied *C. vinaceum* sites found on the Lincoln National Forest. As of 2007, 68 of the 75 occupied sites were within the Sacramento Grazing Allotment, with approximately 62 percent of the total number of thistle stems for the species (Barlow-Irick 2007). The proposed action would continue permitting livestock to be present in the summer pastures occupied by the thistle during the entire summer season (USFS 2007a). The thistle is frequently grazed by livestock outside of fenced areas, with peak use occurring early and late in the grazing season (USFS 2007a). Season-long presence of livestock within the North, South, and Atkinson pastures will increase grazing and trampling impacts to the thistle. The Forest Service concluded that increased exposure to livestock, with forage use and documented thistle herbivory peaking early and late in the summer grazing season (May to October), may not provide the thistle an opportunity to recover (USFS 2007a). We agree with this assessment and anticipate that, within sites that are grazed, thistles will be significantly affected.

Starting around 1990, livestock management practices to control herbivory and trampling and to ensure the suitability and sustainability of thistle habitat have been implemented, such as the construction of 23 enclosure fences covering approximately 290 acres around thistle populations located in the Sacramento Allotment (USFS 2004c). Within the Sacramento Allotment, enclosures protect 23.5 percent of the area of known occupied habitat. Some fenced sites now have thistles extending outside enclosures, indicative of the positive effects of excluding cattle. The existing enclosures are extremely important for the survival and recovery of the species, because, when they are functional, they limit livestock grazing and trampling of these sites by precluding access. However, livestock routinely have been sighted in enclosures due to unmaintained fencing and have been documented drifting from their prescribed winter range into the summer pastures before the set entry date (USFS 2003a, 2007a, Barlow-Irick 2008). We believe these impacts are likely to continue, resulting in further effects to the thistle.

Sixty-three percent of the occupied thistle population sites on the Sacramento Allotment have been fenced to exclude livestock or are considered to be inaccessible to livestock due to very steep slopes or cliffs. In addition, approximately 59 acres proposed for fencing for the jumping mouse will also protect occupied thistle habitat. The Forest Service has constructed two more grazing enclosures (Wills Canyon and Water Canyon) with the goals of restricting cattle access to thistles, protecting bank stability, and maintaining vegetative cover. These new enclosures will protect an additional 19.5 acres of occupied thistle habitat (USFS 2016, pers.comm.).

Thistles located in livestock traps are likely to be severely impacted. One occupied site continues to be a location for cattle drives twice each year (USFS 2003b). Traps will also

concentrate livestock for short periods of time, with utilization levels from 35 percent up to 70 percent. Impacts to thistles through herbivory and trampling are likely to increase correspondingly.

Damage to travertine crusts can adversely affect surfaces critical to the successful germination and reproduction of thistle and inhibit thistle seed movement and dispersal by flowing water (USFS 2003). During drought, the effects of compaction and trampling in drying travertine thistle sites may be even more severe. This damage causes a loss of normal soil structure and permeability that may inhibit processes necessary for the development and establishment of new plants when water flows return to these sites. Grazing and trampling of thistles can damage seedlings, rosettes, and flowering stalks (USFS 2003b). Broken flowering stalks render affected thistles incapable of reproduction (USFS 2007a).

The extended presence of livestock may adversely affect seedlings and their rate of successful establishment and recruitment (USFS 2007a). Trampling can affect recruitment of new plants in soft-substrate outflow streams to the extent that disturbance and damage reduce seedling establishment. We expect that herbivory and trampling at a vulnerable point in the thistle life cycle when seedlings are young and not well established can cause significant losses of plants.

Within the summer pastures, the majority of sites providing water for livestock are springs, with many containing thistles. During drought conditions, livestock are likely to concentrate around springs for water or forage, which is frequently in occupied thistle habitat. This fragile habitat would continue to be subjected to trampling and hoof damage. Impacts to flowering mature plants may effectively negate reproduction because a plant bolts and produces flowers only once in its lifetime. Therefore, we anticipate that broken or consumed flowering stems will render individual affected thistles incapable of reproduction. We find that livestock grazing remains an ongoing threat to the thistle, particularly from season-long grazing throughout the summer pastures.

Cumulative Effects

Cumulative effects may accrue to the thistle through actions taking place on private lands and along highway rights-of-ways. Water rights granted by the State Engineer, and the subsequent development of wells and water systems affect water availability in springs and seeps to varying degrees, depending upon their locations. Development, clearing, grazing, noxious weeds and their treatment on private lands may affect the thistle and its habitat. State highway crew maintenance of the Federal Highway 82 right-of-way regularly impacts plants and habitat on non-National Forest System land between Cloudcroft and High Rolls.

New Mexico Meadow Jumping Mouse

The jumping mouse is restricted to riparian and wetland habitats using herbaceous microhabitats that are generally found as narrow strips of habitat between the edge of flowing water and shrubs (Frey 2007). The jumping mouse has been and continues to be negatively affected by domestic wild ungulate grazing. Ungulate grazing affects jumping mice when it

eliminates or reduces herbaceous plants and litter or alters the composition and structure of herbaceous riparian habitats used by the subspecies (Fleischner 1994; Belsky *et al.* 1999; Frey 2005; Frey and Malaney 2009). Grazing results in the loss of vegetative cover and depletion of food resources needed by individual jumping mice (*Zapus hudsonius*) (Fagerstone and Ramey 1996). Cattle, and elk (*Cervus elaphus*), have contributed substantially to alterations of riparian ecosystems (Beschta *et al.* 2012), including throughout the Sacramento Mountains. Grazing within riparian areas can also result in soil compaction, herbaceous removal, physical damage to plants, and changes in fluvial processes (Trimble and Mendel 1995; Poff *et al.* 2011).

The short life span of the jumping mouse, coupled with the comparatively low fecundity of the species, make it vulnerable to serious adverse effects from ungulate grazing. Any effect that eliminates or greatly reduces reproduction or survival would severely deplete recruitment and persistence of jumping mice. Because the species is only active 3 to 4 months of the year, effects to dense herbaceous riparian vegetation from livestock grazing and trampling can be extremely detrimental. Additionally, if livestock are within occupied habitat during the active season, trampling of individuals in day or maternal nests becomes more probable.

The exceptionally specialized habitat requirements are prone to modification from ungulate grazing and may only be met when herbaceous wetland vegetation is protected and achieves full potential growth (Frey 2007). Disproportionate use of riparian areas occurs in the Sacramento Mountains due to their productivity and sources of perennial water. When ungulates graze in riparian areas, the required vertical cover for the jumping mouse will not be met. Because the Forest Service will construct both permanent and temporary fences along jumping mouse designated critical habitat, grazing will be limited to water gaps, portions of the uplands that are part of the critical habitat designation, and occasional livestock use when cattle enter the area because the fences are down. Grazing will directly reduce vegetative cover in the water gaps and adjacent uplands through removal of plants (ingestion through grazing) and trampling (crushing).

Grazing within jumping mouse habitat affects individual mice by reducing the availability of food resources (Morrison 1987; Morrison 1990; Frey 2005; 2011). Timing of livestock grazing on the allotment coincides with the active season of the jumping mouse. The jumping mouse has a short active season, hibernating about eight or nine months each year (Morrison 1990; VanPelt 1993; Frey 2005). Grazing particularly reduces the amount of food available to jumping mice in the late summer just prior to hibernation, which can limit the accumulation of sufficient fat reserves needed to survive. The species is extremely sensitive to habitat alterations because it must enter hibernation with enough fat reserves to survive the winter and to successfully survive and breed the following spring (Morrison 1990). Whitaker (1972) found that meadow jumping mice (*Zapus hudsonius*) that enter hibernation with a low body mass do not survive. Therefore, factors that reduce the availability of grass seeds and other foods can lower overwinter survival (Whitaker 1972; Morrison 1990) and result in reduced population sizes and eventually extirpation of populations when suitable riparian habitats are overgrazed by ungulates.

The Upper Penasco and Wills Canyon are extremely important streams and are a crucial part in the survival and recovery of jumping mouse. Because jumping mouse habitat is fragmented and isolated, long-term conservation of the jumping mouse requires more than just the maintenance of status quo for the rivers. It requires restoring the system to the point where floodplains rebuild with fine-soiled banks and terraces, which provide habitat for dense riparian vegetation, and the base-flow channel narrows with steeply sloping or overhanging banks.

Although jumping mouse habitat is dynamic and with protection should develop into suitable habitat within several years, slow rates of population growth inherent to the subspecies' biology necessitate long-term commitments to habitat protection. This means permanent protection from livestock grazing that removes, significantly alters, or precludes the development of dense riparian herbaceous vegetation.

Current forage utilization guidelines for the allotment is 35 percent maximum, meaning 65 percent of forage should remain as residual herbaceous vegetation. The current maximum utilization standards are 35 percent, which equate to a minimum stubble height measurement for key species that range from 10.1 cm (4 in) for most grasses, 15.2 cm (6 in) for fescues and 20.3 cm (8 in) for riparian vegetation. These standards are inadequate to provide suitable jumping mouse habitat. Moreover, within riparian habitat where cattle have grazed, the streambanks are trampled and collapsing. Current grazing practices on the Lincoln National Forest have resulted in the removal of dense riparian herbaceous vegetation that historically provided jumping mouse habitat and likely contributed substantially to the loss of historical populations. Importantly, the construction of fences and frequent monitoring will protect habitat and allow natural restoration to proceed unimpeded by livestock.

The Forest Service has proposed significant management changes on this allotment as discussed in the proposed action. Fencing could facilitate the expansion of jumping mouse habitat and limit further extirpation of current populations that would have otherwise occurred, due to the small isolated nature of occupied habitat. The design and installation of effective fencing barriers will limit livestock grazing and protect riparian habitats from damage. The proposed fencing and management changes will greatly assist in improving habitat and connectivity of these systems because they are long-term commitments. As a result of the proposed fencing and changes in livestock management, dense herbaceous riparian vegetation is expected to develop and be maintained in riparian areas that are protected for the foreseeable future.

Habitat loss from ungulate grazing has also resulted in fragmentation of jumping mouse populations, which is the separation of extensive habitats into smaller, isolated patches. Fragmentation has two negative components: loss of total habitat area and isolation of remaining habitat patches. In fact, ungulate grazing has frequently resulted in the extirpation of jumping mouse populations (Morrison 1991; Frey 2005; 2011). It is probable that this pattern was related to little or no long-distance movements or dispersal of jumping mice from lack of connectivity between patches of suitable habitat within specific stream reaches.

Consequently, when ungulate grazing results in loss of suitable habitat, movements and dispersal between populations of jumping mouse are unlikely to occur because movements and dispersal occur almost exclusively along riparian areas with appropriate habitat (Frey 2011). Fencing and other protective measures to restore and maintain jumping mouse habitat will restore additional areas that are currently unsuitable to allow for population expansion and provide connectivity between riparian areas to make re-occupancy possible if localized extirpations occur from natural causes (e.g., flooding, fire, or drought).

Based on the best available science, SSA Report, and listing, we have determined areas considered occupied are where the jumping mouse is reasonably certain to occur. The jumping mouse may be found on additional livestock grazing allotments on the Sacramento Ranger District that have not been surveyed or have had insufficient survey effort to document absence. This will likely be evaluated through future surveys over the next several years. In the interim, any jumping mouse populations or suitable habitat within these areas will likely be subjected to adverse effects from ongoing livestock grazing. However, there are no known jumping mouse populations beyond those analyzed in this BO.

The proposed action will assist in the maintenance and restoration of jumping mouse habitat to support the survival and recovery of the species. We anticipate that 35 percent utilization standards within upland habitat will potentially allow for some use by the jumping mouse but is not likely to provide suitable habitat. This level of grazing could result in habitat loss and/or fragmentation, loss of food resources during the active season or residual vegetation after hibernation.

The installation of 0.3 acres (0.12 hectares) of temporary fencing in Water Canyon just above the confluence of Rio Penasco and Water Canyons contains some potential and suitable habitat for the jumping mouse. The enclosure is near an historical siting of a jumping mouse in the upper Rio Penasco and will provide greater connectivity between other areas of potential or suitable habitat within the watershed.

Interdependent and Interrelated Actions

We also must consider the effects of interdependent and interrelated actions of this proposed action to the jumping mouse and its habitat. Interrelated actions are actions that are part of a larger action, and are dependent on the larger action for their justification. Interdependent actions are actions that have no independent utility apart from the action under consideration.

Under the proposed action, we anticipate unauthorized grazing may occur infrequently within enclosures when fences are down or gates are inadvertently left open. These effects are considered interrelated and interdependent with ongoing grazing. Therefore, we anticipate that some jumping mice will be adversely affected by trampling, the loss of protective cover, or a reduction in the amount of food available.

In conclusion, the Forest Service is initiating long-term conservation measures within these river systems to ensure protection of riparian habitats and watershed that will assist in the survival and recovery of the jumping mouse. Without these measures, the survival and recovery of the jumping mouse would be in peril. The proposed action along with the constructed fences will assist in the maintenance and restoration of jumping mouse habitat. This action will limit trampling of streambanks and alteration of dense herbaceous riparian vegetation that would have adverse effects on the species, especially because there is a strong tendency for livestock to congregate in riparian habitat. The proposed action will also ensure that food is available within exclosures for jumping mice to accumulate fat reserves prior to hibernation. Although the proposed action will not fence all jumping mouse designated critical habitat, frequent monitoring will inform the Sacramento Ranger District of unauthorized livestock use and enable rapid response. This would ensure these areas provide the necessary features for the species. If these features are not being maintained, then consultation will be reinitiated. Limiting grazing within jumping mouse habitat will also benefit the jumping mouse by increasing the amount of forage and cover for the species. The proposed action of protecting riparian habitat from livestock grazing will restore and maintain important hiding and escape cover from potential predators, which may lead to greater survival and increased dispersal capabilities.

New Mexico Meadow Jumping Mouse Critical Habitat

Because over 50% of all suitable designated critical habitat will be fenced as part of a previous action or managed to restore and maintain the PCEs, the conservation value of proposed jumping mouse designated critical habitat will be met. The PCEs, particularly dense riparian vegetation within protected areas, are not expected to be adversely impacted, except within small areas of unoccupied designated critical habitat where water breaks are placed between livestock exclosures or in designated areas where livestock will cross from one pasture to another. Within the water breaks and crossing areas, livestock will continue to trail and stage because they have a strong tendency to congregate in riparian habitat. Soil compaction, trampling of streambanks, and modification of riparian communities will persist within these small areas; however, these will be placed in locations that do not currently have adequate PCEs present to limit any further impacts to designated critical habitat.

For this consultation, the amount of critical habitat identified is less than what is actually designated in the final designation of critical habitat. The total amount of designated critical habitat in the Sacramento Allotment is 297 ha (733 ac). However, the Forest Service, provided additional information, where in 2015, Open Range Consulting (ORC) was contracted by the US Forest Service to use advanced reconnaissance and remote sensing techniques to generate quantitative map information and trends analysis on vegetation structure and composition within riparian extents for the jumping and its proposed critical habitat. The final outputs include mapping of riparian vegetation structure, a trends assessment based on archive imagery representing past conditions, and an accuracy assessment of products. The change in percent of bare ground, upland vegetation, riparian vegetation, and sedge cover for the CH riparian areas for the Sacramento Allotment was compared using the classifications made from

1m imagery for 1992, 2009, and 2014. Therefore, in the biological assessment the Forest Service provided the acreage for the amount of potential or existing suitable habitat for the jumping mouse for their assessment.

The current forage maximum utilization guideline for this allotment is 35 percent, meaning livestock should not remove 65 percent of forage. The current maximum utilization standards are 35 percent, which equates to a minimum stubble height measurement for key species that range from 10.1 centimeters (4 inches) for most grasses, 15.2 centimeters (6 inches) for fescues and 20.3 centimeters (8 inches) for riparian vegetation. These standards are inadequate to provide suitable PCEs within designated jumping mouse critical habitat. Moreover, within riparian habitat where cattle have grazed, the streambanks are trampled and collapsing. Current grazing practices on the Lincoln National Forest have resulted in the removal or alteration of the PCE dense riparian herbaceous vegetation that historically provided jumping mouse habitat. Importantly, the construction of fences and frequent monitoring will protect designated critical habitat and allow natural restoration of PCEs to proceed unimpeded by livestock. Based on the Forest Service efforts in ground truthing suitable critical habitat based on the species needs 192 ha (476 acres) of the 296 hectares (733 acres) of critical habitat on the Sacramento Allotment was determined unsuitable for the jumping mouse for any portion of its life stages. Whereby, determining that the remainder of habitat was suitable for the jumping mouse 119 hectares (295 acres). Approximately, 53% of designated critical habitat (based on the Forest Service ground truthing exercise) within Sacramento Allotment will be protected because of current grazing and proposed grazing management as described in the biological assessment and supplemental information.

Interdependent and Interrelated Actions

We also must consider the effects of interdependent and interrelated actions of this proposed action to the jumping mouse and its habitat. Interrelated actions are actions that are part of a larger action, and are dependent on the larger action for their justification. Interdependent actions are actions that have no independent utility apart from the action under consideration.

Under the proposed action, we anticipate unauthorized grazing may occur infrequently within enclosures when fences are down. These effects are considered interrelated and interdependent with ongoing grazing. The Forest Service has proposed a minimum of weekly inspections and other irregular visits to identify and remedy these situations. When livestock are found within enclosures, the Forest Service will inform the permittee within 24 hours to remove the livestock and repair the fence within 72 hours. Nevertheless, it is possible that livestock could graze these areas for several days between inspections. Therefore, we anticipate that some PCEs will be adversely affected by trampling and consumption of riparian vegetation can cause the loss of protective cover, or a reduction in the amount of food available. We estimate that no more than 0.4 (ha) (1.0 ac) of designated critical habitat may be adversely affected by high impacts or up to 4.0 ha (10 ac) of designated critical habitat may be adversely affected by light impacts during short-term incursions into excluded areas depending on the number of livestock and duration of time livestock stay in the excluded areas (BLM

1999). In addition, small, unprotected areas and trail ways will be adversely affected by trampling, the loss of protective cover, or a reduction in the amount of food available but this is not anticipated to appreciably reduce the function of designated critical habitat.

The proposed action includes specific measures that were recommended in the Recovery Outline (Service 2014c). Therefore, implementation of the proposed action is not expected to diminish the function and conservation role of designated critical habitat to the recovery of the jumping mouse. Therefore, given approximately 53% of designated critical habitat within Sacramento Allotment will be protected from grazing and the remaining 47% will be grazed within the 35% grazing maximum utilization standards, except the Wright Spring and Atkinson livestock traps and associated handling facilities will be authorized for a utilization up to 70% which is outside of critical habitat. We determine that the proposed action will not reduce the Unit's functionality to support recovery of the jumping mouse or impede the Unit's ability to contribute to the recovery of the species within the watershed. The proposed action of managing ongoing livestock grazing will not prevent Unit 4 from contributing to the species' redundancy and resiliency within the watershed and throughout its entire range.

In conclusion, the Forest Service is initiating long-term conservation measures within these riparian ecosystems to ensure protection of riparian habitats and watershed that will assist in the survival and recovery of the jumping mouse. Without these measures, the survival and recovery of the jumping mouse would be in peril. The proposed action will assist in the maintenance and restoration of PCEs within designated jumping mouse critical habitat. This action will limit trampling of streambanks and alteration of dense herbaceous riparian vegetation that would have adverse effects on the PCEs, especially because there is a strong tendency for livestock to congregate in riparian habitat. Although the proposed action will not fence all designated jumping mouse critical habitat, frequent monitoring will ensure these areas provide the necessary PCEs of designated critical habitat

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. 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.

Elk populations, which are managed by the State, regularly affect jumping mouse populations by reducing the suitability of habitat through the elimination of food or cover resources. Careful management is needed to address the reduction, alteration, or elimination of vertical cover of dense herbaceous riparian vegetation, which renders the habitat too sparse for use by the jumping mouse or may disrupt normal behaviors. Beyond wild ungulate grazing, we are not aware of any future State, local, or private actions expected to occur within the action area that would not require some type of Federal permitting or review due to potential impacts to waterways, wetlands, or the habitats of federally listed species.

We also anticipate that jumping mouse habitat will be negatively affected by climate change occurring now and into the future, which may amplify the lack of available water within streams and springs resulting from lower precipitation trends and drought (see also SSA Report; Service 2014c). For example, increased and prolonged drought associated with changing climatic patterns is likely to adversely affect jumping mouse habitats by reducing water availability and potentially shrinking the amount of herbaceous riparian vegetation as water recedes. However, we lack sufficient certainty to accurately predict how climate change will ultimately affect jumping mouse populations.

CONCLUSION

Jeopardize the continued existence of is defined as to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

Recovery is defined as the improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a) (1) of the Act (50 CFR § 402.02).

This biological opinion relies on the revised regulatory definition of “destruction or adverse modification” of designated or proposed critical habitat from 50 Code of Federal Regulations (CFR) 402.02. As of February 11, 2016, the definition of “destruction or adverse modification” has been revised to align it with the conservation purposes of the Endangered Species Act of 1976, as amended (Act), and the Act’s definition of “critical habitat” (81 FR 7214).

Mexican Spotted Owl

After reviewing the current status of the Mexican spotted owl, the environmental baseline for the action area, the effects of the proposed ongoing grazing for the Sacramento Allotment, and the cumulative effects, it is our biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the Mexican spotted owl nor is it likely to destroy or adversely modify designated critical habitat within the Basin and Range East EMU or rangewide. We also do not expect the effects of the proposed action to appreciably alter the function and intended conservation role of Mexican spotted owl critical habitat, nor is it expected to impede the survival or recovery of the Mexican spotted owl. We make these findings for the following reasons:

1. We found that some aspects of the proposed action have the potential to cause adverse effects to areas within 6 PACs (Atkinson, Radio Tower, Wilmeth, Bluff Springs, Dark, Lightning, and Hubble) of the Sacramento Allotment that contain greater than 50 acres of meadow habitat. Nevertheless, it is anticipated that these impacts will be short-term and will not affect the role of critical habitat unit BR-E-1b relative to the conservation of the Mexican spotted owl and to the overall critical habitat designation.

2. The PCE that will be affected by the proposed action is Mexican spotted owl prey habitat. Even with adverse effects occurring to this PCE in some areas of the allotment, we conclude that the surrounding PCEs of critical habitat will remain intact and essentially unaffected (i.e., the effects will be insignificant and discountable) by livestock grazing.
3. The proposed forage/range guidelines and monitoring and enforcement should allow the overall range conditions to gradually improve within PACs on the summer pastures within the allotment. Still, we found that the current degraded conditions within some PACs indicate that the range/forage guidelines may not be attained in the short-term.
4. The primary effect to Mexican spotted owl will be loss of prey cover in some years. As noted above, only seven of 46 PACs have greater than 50 acres of meadow habitat. We anticipate that only three of six PACs will not have prey cover within meadows in a given year, which represents less than 2 percent of the 196 PACs identified in the Basin and Range East EMU and less than .02 percent of the 1,025 PACs located within the Forest Service lands of Arizona and New Mexico. This is a relatively small percentage of the total number of PACs.

Sacramento Mountains Thistle

The proposed management of the Sacramento Allotment allows interaction between livestock and accessible thistle occurrences, as well as with suitable and potential habitat. Impacts are both direct and indirect. After reviewing the current status of the thistle, the environmental baseline for the action area, the effects of the proposed livestock grazing on the Sacramento Allotment and the cumulative effects, it is our biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the thistle. Critical habitat for this species has not been designated; thus, none will be affected. We make this finding because 63 percent of the occupied population sites on the Sacramento Allotment have been fenced to exclude livestock or are considered to be inaccessible to livestock due to very steep slopes or cliffs. In addition, approximately 59 acres proposed for fencing for the jumping mouse will also protect occupied thistle habitat. Even though the proposed action will result in annual significant adverse effects to the species, protection provided by the exclosures has resulted in high survival of thistle populations and the ability to recover in areas, even expanding populations outside fences. The District has committed to conducting compliance checks 2 to 3 days each week or more frequently if needed, along with any needed maintenance, while livestock are on the summer pastures. The maintenance of these existing exclosures is extremely important and will continue to protect occurrences of the thistle from livestock impacts.

New Mexico Meadow Jumping Mouse

After reviewing the current status of the jumping mouse, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's

biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the endangered jumping mouse. We also find that the effects are not likely to destroy or adversely modify designated critical habitat. Consequently, we do not expect the effects of the proposed action to impede the survival or recovery of the jumping mouse. We make these findings for the following reasons:

1. We anticipate a relatively small amount of low to moderate quality jumping mouse habitat and PCEs that will be impacted by the proposed action through water gaps and trailing.
2. We anticipate minor, temporary, direct and indirect effects to areas currently occupied by jumping mice through occasional unauthorized use, which will be minimized by frequent inspections and monitoring.
3. Most of the impacts to suitable habitat within exclosures will be due to rare, random events and are anticipated to be short-term from frequent inspections and monitoring.
4. The implementation of protective measures for the jumping mouse will result in a significant gain in habitat and connectivity over existing conditions.
5. The Forest Service adjusted their proposed action and committed to initiating a series of protective and recovery actions designed to reduce direct and indirect threats and improve the status of the jumping mouse.

We do not believe the likelihood of survival and recovery of the jumping mouse will be compromised due to the implementation of the proposed action because improved habitat quality and quantity are anticipated as the PCEs in riparian areas are predominantly restored and maintained due to fencing and changes in management.

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 is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Forest Service so that they become binding conditions of any grant or permit issued to an applicant/permittee, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest Service (1) fails to assume and implement the terms and conditions or (2) fails to require the (applicant) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest Service must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [see 50 CFR 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

Mexican spotted owl

Amount or extent of take

Our policy states that incidental take can only be supported if an activity compromises the integrity of a Mexican spotted owl PAC (Service 1996). The Service anticipates that the proposed action will result in incidental take of Mexican spotted owls in the form of harassment due to potential for significant habitat alterations of Mexican spotted owl prey habitat.

To the extent that this statement concludes that take of Mexican spotted owl, a migratory bird, will result from the agency action for which consultation is being made, the Service will not refer the incidental take of any such migratory bird for prosecution under the MBTA of 1918, as amended (16 U.S.C. §§ 703-712), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

For the purpose of evaluating incidental take of Mexican spotted owls from the action under consultation, incidental take can be anticipated as the alteration of habitat that affects behavior (e.g., breeding or foraging) of birds only temporarily, or to such a degree that the birds are considered lost as viable members of the population and thus “taken.” Birds experiencing only temporary or short-term effects may fail to breed, fail to successfully rear young, or raise less fit young; longer-term disturbance may result in owls deserting the area because of chronic disturbance or because habitat no longer meets the owl’s needs.

We anticipate that the proposed action is reasonably certain to result in incidental take of Mexican spotted owls. However, it is difficult to quantify the number of individual owls taken because: (1) dead or impaired individuals are difficult to find and losses may be masked by seasonal fluctuations in environmental conditions; (2) the status of the species could change over

time through immigration, emigration, and loss or creation of habitat; and (3) the species is secretive and we rarely have information regarding the number of owls occupying a PAC and/or their reproductive status. For these reasons, we will attribute incidental take at the PAC level. This fits well with our current section 7 consultation policy which provides for incidental take if an activity compromises the integrity of an occupied PAC to an extent that we are reasonably certain that incidental take occurred (Service Memorandum, February 3, 1997). Actions outside PACs will generally not result in incidental take because we are not reasonably certain the owls are nesting and roosting in areas outside of PACs. We may modify this determination in cases when areas that may support owls have not been adequately surveyed and we are reasonably certain owls may be present.

For this proposed project, take of Mexican spotted owls may be in the form of harassment within affected PACs. The level of incidental take can be anticipated when forage utilization results in Mexican spotted owl prey cover less than 4 inches. The primary type of take expected to result from grazing on the Sacramento Allotment is through harassment by the reduction of suitability of the habitat for prey species, thus limiting the availability of prey for Mexican spotted owls. Based on the best available information concerning the Mexican spotted owl, habitat needs of this species, the proposed project description, and information furnished by the Forest Service, take is considered likely for the Mexican spotted owl as a result of the following actions:

We believe that some PACs currently have reduced prey cover from not meeting the forage utilization guideline during the Mexican spotted owl breeding season. Range restoration is a long-term process. Improvement in the overall range conditions on the Sacramento Allotment will likely be a slow process and will only occur if forage/range guidelines are met every year. Consequently, good to excellent range conditions are not likely to be attained in PACs. We believe that implementation and enforcement of forage/range guidelines will be enough to improve prey habitat conditions within and adjacent to most PACs on the allotment. We identified seven PACs within the Sacramento Allotment that contain greater than 50 ac of meadow habitat (Atkinson, Radio Tower, Wilmeth, Bluff Springs, Dark, Lightning, and Hubble). We anticipate that incidental take is reasonably certain to occur within three of these PACs in a given year. As such, three pairs of Mexican spotted owls and their associated young are anticipated to be harassed by the proposed action.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to jeopardize the continued existence of the Mexican spotted owl.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take.

1. Conduct all proposed activities in a manner that will minimize disturbance to the Mexican spotted owl.

2. Conduct all proposed activities in a manner that will minimize modification and loss of Mexican spotted owl habitat.

Terms and Conditions for the Mexican Spotted Owl

In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service and their employees, contractors, or subcontractors must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Service established the following Terms and Conditions to implement Reasonable and Prudent Measure 1.

- 1.1 Fences, corrals, trick tanks, livestock traps, or other livestock management construction or maintenance activities that occur within PACs will continue to be conducted outside of the Mexican spotted owl breeding season or after non-nesting status has been determined.
- 1.2 Within PACs, Forest Service employees and the livestock permittee shall strictly limit their activities, vehicles (including off-highway vehicles), equipment, and construction materials to the open roads and motorized trails or appropriate livestock management areas/activities (e.g., livestock traps). Exceptions are allowed to monitor key areas.
- 1.3 Mexican spotted owl PAC boundaries shall be discussed with the permittee to ensure that livestock concentrations and associated activities such as salt or mineral supplement sites shall not occur within PACs. Salting guidelines from the FEIS shall be followed. Exceptions will only include salting within those areas of some PACs (i.e., ridgetops and open-canopied areas) when used as a range management tool to decrease impacts in riparian and Mexican spotted owl high-use areas. The AOIs shall indicate areas that are appropriate for salting to minimize impacts to Mexican spotted owls.

The Service established the following Terms and Conditions to implement Reasonable and Prudent Measure 2.

- 2.1 The Forest Service shall provide a report documenting how the project is in compliance with the proposed action (i.e., implementation monitoring). The Forest Service shall provide the Service with all of the forage/range guidelines monitoring information, any related

documents (e.g., a copy of the AOI), and an annual implementation progress report. Except for the reporting requirements for forage/range guidelines that will be due within 30 days of each monitoring period (including any management actions taken as a result of monitoring), the AOI and the project report shall be submitted to the Service annually within one month of issuing the AOI, or any amendments to the AOI.

2.2 During periods when forage production may be low on summer pastures, the Forest Service will monitor forage/range guidelines and manage the Sacramento Allotment consistent with the Forest Service's range management regulations (e.g., 36 CFR 222), (e.g., adjustments will occur to meet forage/range guidelines).

2.3 The Forest Service shall establish two more key areas within the Hubble, and Bluff Springs PACs. Monitoring of these and other key areas shall follow appropriate monitoring methods. Monitoring of herbaceous ground cover will be conducted during the required time frame. These data will be used to determine when forage/range guidelines within key areas are attained and will follow the reporting schedule above.

New Mexico Meadow Jumping Mouse

Amount or extent of take

Based on the best available information concerning the jumping mouse, the habitat needs of the species, the project description, and information furnished by the Forest Service, take is considered likely, given surveys that documented presence of the species, the project's proximity to water, vegetation structure, as well as historical records of occurrence within nearby high quality habitats. Based upon the proposed action, it is estimated that temporary changes in the habitat characteristics needed by the species will occur as a result of the project. The Service anticipates that ongoing livestock grazing will result in the incidental take of an undetermined number of jumping mice associated with 0.4 to 4.0 hectares (1.0 to 10.0 acres) of jumping mouse habitat, based on severity of grazing, per year. Take may occur through livestock use of unprotected areas in jumping mouse habitat (critical habitat outside of exclosures), or utilization that is more than very light grazing (>20%) within exclosures as measured using the Landscape Appearance Method.

We anticipate that in most cases, take as a result of the proposed action will be in the form harassment of the jumping mouse through effects that disturb or alter habitat from livestock grazing. Some individual jumping mice may be injured or food and cover resources affected as a result of the implementation of the proposed action, but we anticipate this number to be small because the Forest Service will conduct regular monitoring of exclosures and livestock will be removed quickly.

We anticipate that incidental take of the jumping mouse will be difficult to detect because the species has a small body size and detection of an injured individual will be extremely difficult. For these reasons, it is not reasonable to express the amount of anticipated take of in terms of the number of individuals. Moreover, we conclude there is a causal link between jumping mice and

suitable microhabitat conditions (e.g., tall, dense riparian vegetation primarily composed of sedges and forbs) because the jumping mouse requires specialized habitat requirements to support its life-history needs. As a result, jumping mice would not be found in areas that lack suitable habitat. Because the jumping mouse is intimately tied to its habitat, take may occur in areas that currently contain suitable physical and biological features of habitat if those features would be adversely affected by the proposed action, as well as in areas that are prevented from developing suitable physical and biological features by the proposed action. As a result, we are using suitable habitat within exclosures (27 ha (66 ac)) as well as riparian and upland habitat outside of exclosures as a surrogate for determining when the authorized take has been exceeded. This metric is appropriate because suitable jumping mouse habitat is composed of dense herbaceous riparian vegetation and intact adjacent uplands, which are elements of habitat that are anticipated to be altered or disturbed if livestock temporarily enter exclosures or over utilize areas in critical habitat. Take may occur outside of exclosures where livestock may concentrate due to topography or livestock management practices. We assume that this will occur in designated critical habitat outside of exclosures. It is likely that some level of habitat alteration will result in take during implementation of the proposed action. In these cases, take would likely be in the form of reduced habitat suitability that may affect individual mice (and much needed recruitment) by reducing food, cover, or increased potential for predation due to loss of cover or a need to move.

Incidental take will be determined by using the severity of impact from unauthorized livestock grazing in exclosure areas or closed grazing areas and utilization in jumping mouse habitat outside of exclosures. The following scenarios are defined by the impacts to habitat using the Landscape Appearance Method (BLM 1999) and/or stubble height measures. Take may occur in the following scenarios:

- 1) Up to 20% herbaceous utilization class, averaged for any given exclosure after documented unauthorized use; or
- 2) Up to 35% herbaceous utilization occurs within critical habitat, both riparian and upland, outside of exclosures where livestock grazing is authorized. The exception would be in water gaps where livestock may concentrate, within corrals, and within the horse pasture.

If this amount of take is exceeded (as stated above), then as provided in 50 CFR Section 402.16, reinitiation of formal consultation would be required.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to jeopardize the continued existence of the jumping mouse. We have based this determination on the small amount of habitat to be temporarily impacted and because we expect that connectivity will be improved through livestock management and fencing. The Forest Service installed fencing prior to onset of the 2016 grazing season to minimize and prevent entry and grazing by livestock. However, based on agreement by the Forest Service

and the permittee, the electric fence for the Peñasco trap enclosure was removed at the beginning of October 2016 to allow for processing of livestock in this area for a two week designated period.

REASONABLE AND PRUDENT MEASURES

The reasonable and prudent measures, and implementing terms and conditions are designed to minimize the effects of incidental take that might otherwise result from the action. In addition to the Conservation Measures already proposed as part of the project description, the Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the jumping mouse:

- a. The Forest Service will monitor all aspects of ongoing grazing within the action area to assure project completion and success.
- b. The Forest Service will consider all information collected for the 2016 summer grazing season and implement adaptive management to minimize impacts to New Mexico meadow jumping mouse habitat.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service and their employees, contractors, or subcontractors must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring. These terms and conditions are nondiscretionary.

The Service established the following Terms and Conditions to implement Reasonable and Prudent Measure 1.

- 1.1 The Forest Service will perform compliance checks two times per week throughout the grazing season and report weekly to the Service via phone or email.
- 1.2 The Forest Service will conduct and record ocular estimates using the Landscape Appearance Method at established photo points in each protected area four times during the grazing season.
- 1.3 The Forest Service will also monitor key species utilization at established photo points and adjust the list throughout the season. This will reflect the potential that, on the Lincoln National Forest, seed stalk may not be evident from April to July, and growth in these areas may not exhibit these characteristics in that time frame because of temperatures and elevation. It is more prone for that kind of development when temperatures and monsoonal precipitation increase after July.

KEY SPECIES: APRIL thru JULY

- April –July = 0-5%: The key species show no evidence of grazing use or negligible use.
- April – July = 6-20%: The key species has the appearance of very light grazing. Some plants may be topped or appear slightly grazed. Young plants are little disturbed.

KEY SPECIES: JULY thru NOVEMBER

- July – November = 0-5%: The key species show no evidence of grazing use or negligible use.
- July – November = 6-20%: The key species has the appearance of very light grazing. Some plants may be topped or appear slightly grazed. Current seedstalks and young plants are little disturbed.

- 1.4 If livestock gain entry into exclosures, the Forest Service will contact both the Service and permittee within 24 hours of their discovery.
- 1.5 If livestock gain entry into exclosures, the Forest Service will analyze impact to the area relative to the incidental take scale as estimated with the Landscape Appearance Method or other suitable method. The Forest Service shall report to the Service the extent of habitat affected to ensure that it does not exceed the authorized take limits within 72 hours of removal of cattle (resource measurement).
- 1.6 The Forest Service shall discuss conservation measures, management actions, and terms and conditions that limit grazing impacts in jumping mouse habitat with all permittees to ensure that ongoing livestock grazing does not affect jumping mouse habitat outside of exclosures and beyond conservative use.
- 1.7 The Forest Service shall ensure that exclosures and other fences are functional and maintained prior to livestock entry for the grazing season and throughout the grazing season.
- 1.8 The Forest Service shall report any unauthorized activities (i.e., impacts outside of the proposed action) immediately to the Service.
- 1.9 The Forest Service shall provide an annual post-grazing season report documenting how the project complied with the proposed action (i.e., implementation monitoring).
- 1.10 The Forest Service shall work with the Allotment Permittees to reduce incursions into jumping mouse exclosures. During the first three years of the term of this BO, the Forest Service shall document a baseline of mean annual incursions. During the next 5 years, the Forest Service shall work with the permittees to reduce the number of incursions by greater than 50% and then greater than 75% over the following 3 years.

- 1.11 The Forest Service shall minimize the effects of herding, trailing, and trampling and report measures taken in their annual post-grazing season report.
- 1.12 To lessen or eliminate detrimental effects to riparian areas, the Forest Service shall take advantage of opportunities to trail livestock on the existing road system while moving cattle to and from grazing pastures.
- 1.13 To reduce the likelihood or amount of take occurring outside of exclosures in occupied habitat, with the exception of small, strategically placed water gaps/lanes, minimize utilization (less than 20%) in the uplands and riparian zone within critical habitat.

The Service established the following Terms and Conditions to implement Reasonable and Prudent Measure 2.

- 2.1 The Forest Service will assess conditions of the Peñasco trap prior to the two week designated period for herd processing to determine baseline conditions and post-processing to determine impacts to habitat previously protected by the electric fencing.
- 2.2 Based on the Landscape Appearance Method or other suitable method, if conditions in the Peñasco trap, previously excluded from livestock grazing by the electric fencing, are determined to be greater than light to moderate (21-40%) use, removing the fencing below the weigh station shall not occur in 2017 or beyond.

Review requirement: The Service designed reasonable and prudent measures, with their implementing terms and conditions, to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Forest Service must immediately provide an explanation of the causes of the taking and review with the New Mexico Ecological Services Office the need for possible modification of the reasonable and prudent measures.

Disposition of dead or injured listed animals

Upon finding dead, injured, or sick individual endangered or threatened species, initial notification must be made to the nearest Service Law Enforcement Office. In New Mexico, contact the Law Enforcement Office (505-346-7828) or the New Mexico Ecological Services Field Office (505-346-2525). Written notification must be made within five (5) calendar days and include date, time, and location, photograph, and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible condition. If feasible, remains of intact specimens of listed species will be submitted to educational or research institutions holding appropriate State and Federal permits. If such institutions are not available, information noted above will be obtained and the carcass left in place.

Arrangements regarding proper disposition of potential museum specimens will be made with the institution before carrying out of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any listed species survive treatment, we should be contacted regarding final disposition of the animal.

Certain project activities may also affect species that are protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA). The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. BGEPA prohibits anyone, without a permit issued by the Service, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you believe migratory birds will be affected by the project, we recommend you contact our Migratory Bird Permit Office, P.O. Box 709, Albuquerque, NM 87103, (505) 248-7882, or permitsR2mb@fws.gov. For more information regarding the MBTA, please visit the following websites: <http://www.fws.gov/migratorybirds> and <http://www.fws.gov/migratorybirds/mbpermits.html>.

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. The term "conservation recommendations" has been defined as Service suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a) (1) responsibility. In order for the Service to be kept informed of activities that either minimize or avoid adverse effects or that benefit listed species or their habitats, the Service requests notification of the implementation of the conservation recommendations below. The Service recommends the Forest Service implement the following conservation recommendations.

Mexican Spotted Owl

1. We recommend that the Forest Service work with other entities to identify studies designed to gain a comprehensive understanding of how ungulate grazing affects the habitat of the Mexican spotted owl and its prey species.
2. We recommend that the Forest Service assess the carrying capacity for livestock grazing in the allotment during National Environmental Policy Act analysis.

New Mexico Meadow Jumping Mouse

1. We recommend that the Forest Service complete comprehensive jumping mouse surveys within areas that have not been surveyed since 2005 and 2006, but also in areas that contain suitable habitat. Surveys should also be conducted within areas

where riparian vegetation is restored to document project success. This information will greatly assist all parties in gaining a better understanding the current status and whether habitat restoration leads to additional populations of the species. The Service discourages the Forest Service from assuming potential habitat is unoccupied until up-to-date surveys have been conducted. Therefore, the Forest Service should assume future projects in potential habitat may adversely affect jumping mice and should consult with the Service before implementing new projects.

2. We recommend that the Forest Service continue to collect information on New Mexico meadow jumping mouse, such as diet, use of uplands, etc., to assist in better describing habitat requirements.
3. We recommend that the Forest Service assess the carrying capacity for livestock grazing in the allotment during National Environmental Policy Act analysis.

Sacramento Mountains Thistle

1. The Forest should continue to pursue restoration of hydrological processes that are required by the thistle throughout the Sacramento Allotment by cooperative efforts with the permittee.
2. The Forest should explore and continue to pursue control of exotic competitors of the thistle, such as teasel. Likewise, the Forest should monitor the potential range expansion of insect predators to determine whether the threat is increasing.
3. The Forest should implement proactive measures to prevent new infestations or treat infestations of insect predators if determined to be an increasing threat.
4. The Forest should continue extensive monitoring of thistle occurrences.
5. We strongly encourage the continued protection of thistles through construction and maintenance of exclosures.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed action on the effects of ongoing livestock management on the Sacramento Allotment on the Lincoln National Forest. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (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 exceeds authorized amounts, any operations causing such take must cease pending reinitiation.

In future communications regarding this consultation please refer to consultation #02ENNM00-2016-F-0440. If you have any questions, please contact Ron Maes at the letterhead address or at (505) 761-4710.

Sincerely,

Wally Murphy
Field Supervisor

cc: Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico (electronic copy).
Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division, Santa Fe, New Mexico (electronic copy)

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APPENDIX A

The USDA Forest Service, Southwestern Region, and the Sacramento Grazing Association (Permittee) signed a Joint Proposal for Completion of Work in the Rio Peñasco Area on the Sacramento Allotment related to the NMMJM [New Mexico Meadow Jumping Mouse] (Agreement) on October 1, 2016, after several site visits and meetings to modify the proposed action for the 2016 grazing year.

Final Draft

Joint Proposal for Completion of Work in the Rio Peñasco area on the Sacramento Allotment Related to the NMMJM

September 29, 2016

Both the Forest Service and the Goss's are agreeing to make a good faith effort to fully comply with the terms of this proposal. This is not a legally-binding commitment by either party and does not waive or modify existing requirements or rights that any party might have under applicable law.

- 1) All electric fences east of the corral in Rio Peñasco (Enclosure #2 and #3) will be removed the first week in October (3-7) prior to roundup and shipping. The electric fences west of the corral will be realigned and narrowed down to bank to bank with a water gap as proposed in the attached map.
- 2) A small electric fence enclosure will be constructed in Water Canyon prior to cattle coming into the trap during October 3-7.
 - a. All electric fence alterations will be completed by the Forest Service during the first week of October (October 3-7, 2016).
 - b. All electric fences will be upgraded to 2-3 wires prior to livestock moving into the Rio Peñasco in October.
 - c. Any changes in enclosures will be disclosed to the Goss's prior to implementation for consultation and review. Any changes to the existing temporary fence line will be agreed upon by all parties prior to implementation in order to accommodate ranching operations while still protecting the habitat for the mouse.
 - i. Movement of the fenced areas is not to be construed as an agreement that any water rights claim by the Goss's in the Rio Peñasco or Wills Canyon may be taken.
- 3) Up to 200 head of cow/calf pairs can be worked in the Rio Peñasco trap for up to 12 days in mid to late October (not prior to October 10), with the understanding that they would be moved in to the corrals/trap, separated, and calves shipped as quickly as possible depending on weather conditions, change in the date of sale by the buyer, or any other unforeseen circumstances.
- 4) Monitoring in the fall and after livestock leave the area will be done using RAM or RAPID methods or another monitoring method agreed upon with the Goss's and will be done in the same areas as 2015. Monitoring in the winter and spring will measure elk impacts on depth and forage utilization. All monitoring sites will be coordinated with the Goss's. Monitoring will take into account unforeseen weather events.
- 5) The rest of the herd will be worked in the new corrals at Atkinson and in the Wills Canyon corrals and trap once constructed in accord with paragraph 8) a. below for a period of up to 12 days.
- 6) Grazing utilization can be up to 70% within the Rio Peñasco corrals and the adjacent Horse Pasture.
- 7) Fencing will be constructed to keep elk out as well as cattle when funding is made available. If elk fencing is constructed, adequate gates will be installed to allow SGA access to the traps for grazing and watering.

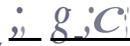
- a. Congressman Pearce's office is working on securing funding for half of the 11.5 miles of fence line.
 - i. An estimate of costs to construct elk fencing to replace electric fencing provided to Congressman Pearce's staff on July 6, 2016.
 - b. Congressman Pearce's office, Rep. Townsend and FS will address elk issue with NM Game & Fish.
 - c. FS will discuss options with the NM Game & Fish, Rep. Townsend, and Rep. Pearce's office to address the effects of elk grazing on forage availability on grazing allotments. FS will look at increasing grazing numbers during the NEPA process.
- 8) The FS will help the Goss's construct holding pens by October 2016 to relieve pressure on Rio Peñasco corrals and facilities during fall roundup. The Goss's will not be taking the lead in building these facilities, but will work with the FS to draw up how the facilities need to be built.
- a. New corrals will be constructed in the Atkinson Pasture in 2016 prior to Fall roundup (October 1, 2016). The corral and trap in the Wright Spring and the corrals Wills Canyon areas will be upgraded to allow for additional livestock gathering to reduce impacts in critical habitat in the Rio Peñasco area. This will be completed in 2016, prior to fall roundup (October 1, 2016).
- 9) Trap facilities should handle only as many cattle as will be processed in the 12day period and should utilize adjacent upland holding facilities as they become available. This will also depend on weather conditions, change in the date of sale by the buyer, or any other unforeseen circumstances.
- 10) The Goss's will use their best effort and good faith to remove cattle that are within enclosure areas in a timely fashion to allow for PCE's to be established within those areas. The temporary nature and condition of fencing will be taken into account in meeting PCE's. The Forest Service will take into account the condition of the current fences in determining if any action will be taken regarding cattle in the enclosures – Goss's
- 11) The Goss's are not giving consent, implied or otherwise, for any government agency to take away any valid existing rights.
- 12) This agreement will not affect any existing water rights regardless of any fencing being put up.
- 13) These are short-term solutions. The terms of this agreement will last through December 31st, 2016. All concerned parties will need to meet again to discuss long-term solutions.

Moving forward, the Forest Service generally agrees to the following:

- a. The Sacramento allotment is currently scheduled for NEPA analysis in 2019. If the current permit expires before the NEPA process has been completed, the FS, notwithstanding any other law, shall issue a new permit on the same terms and conditions and for the full term of the expired or waived permit. Upon completion of the scheduled NEPA analysis and decision for the allotment, the terms and conditions of existing grazing permits may be modified or re-issued, if necessary to conform to such NEPA analysis.
- b. Additional corrals proposed in the Goss's 2/8/2016 letter will be considered during the NEPA analysis and decision making process for implementation of long-term protection of critical habitat for the NMMJM. This proposal includes the following: Hay Canyon Corral and Trap;

Russia Canyon drinker, corrals and trap; Lucas/Dark trick tank reconstruction; Benson Canyon corral and large trap; Dark holding trap; Dry Canyon trap and corral reconstruction; Peñasco horse trap elk fence; Peñasco northside expansion; Pasture Ridge trap and corral expansion; River trap expansion and corrals below lake and corrals above lake; Taylor Canyon washout reconstruction; Pasture Ridge Road grade repair; general trick tank repair; and general tank cleaning. Facilities in the 64 Rd and head of the Sacramento River will be discussed for long term solutions.

 9/30/2016
Cal Joyner
Regional Forester


Justin Goss
Sacramento Grazing
Association

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