DRAFT ENVIRONMENTAL ASSESSMENT FOR THE DESIGNATION OF CRITICAL HABITAT FOR THE NEW MEXICO MEADOW JUMPING MOUSE

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FOR THE DEPARTMENT OF INTERIOR
U.S. FISH AND WILDLIFE SERVICE

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ACRONYMS

AGFD	Arizona Game and Fish Department
ACEC	Area of Critical Environmental Concern
ASLD	Arizona State Land Department
AO	Authorized Official
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CBM	Coalbed Methane
BO	Biological Opinion
CCP	Coordinated Conservation Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CODOW	Colorado Division of Wildlife
COE	U.S. Army Corps of Engineers
DOI	U. S. Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FO	Field Office
FR	Federal Register
HUC	Hydrologic Unit Code
IPM	Integrated Pest Management
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NMDGF	New Mexico Department of Game and Fish
NRCS	Natural Resources Conservation Service
NWR	National Wildlife Refuge
OHV	Off-Highway Vehicle
PCE	Primary Constituent Element
SSA	Species Status Assessment Report
USFWS	United States Fish and Wildlife Service
WSCA	Wildlife of Special Concern in Arizona

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

INTRODUCTION

The purpose of this draft Environmental Assessment (EA) is to analyze the environmental consequences that may result from the designation of critical habitat for the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*). On June 20, 2013, the USFWS published a proposed rule to list the New Mexico meadow jumping mouse as endangered under the Endangered Species Act of 1973 (ESA), as amended (78 FR 5369) concurrently with a proposed rule to designate critical habitat for the species (78 FR 5351). It is the USFWS's position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses pursuant to the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 *et seq.*) in connection with designating critical habitat under the Act. However, when the range of the species includes States within the Tenth Circuit, in this instance Colorado and New Mexico, under the Tenth Circuit ruling in *Catron County Board of Commissioners* v. *U.S. Fish and Wildlife Service*, 75 F.3d 1429 (10th Cir. 1996), the USFWS will undertake a NEPA analysis for critical habitat designation.

This draft Environmental Assessment (Draft EA) will be used by the USFWS to decide whether critical habitat will be designated as proposed or if further refinements or analyses are needed. If the proposed action is selected as described, or with minimal changes, and no further environmental analyses are needed, a Finding of No Significant Impact (FONSI) would be prepared. If significant impacts are found, or major changes are needed, an Environmental Impact Statement would be prepared. This Draft EA presents the purpose of and need for critical habitat designation, the proposed action, and an evaluation of the direct, indirect, and cumulative effects of the alternatives pursuant to the NEPA of 1969 as implemented by the Council on Environmental Quality (CEQ) regulations (40 CFR 1500, et seq.) and according to the U.S. Department of the Interior (DOI) NEPA procedures (43 CFR 46).

PURPOSE AND NEED FOR THE ACTION

The New Mexico meadow jumping mouse is threatened by a combination of factors including habitat loss and degradation, inadequate existing regulatory mechanisms, and other natural or manmade factors (78 FR 37363). Habitat loss and degradation is the primary stressor causing the subspecies to have low probability of persistence and high probability of extinction over the near term (USFWS 2013b). The habitat for each of the 29 existing populations has been reduced to

patches which are too small to withstand future catastrophic events (USFWS 2013b). These populations are not resilient to future habitat losses or degradation.

The purpose of the action is to propose critical habitat for the New Mexico meadow jumping mouse. The proposed designation of critical habitat identifies geographic areas that are essential for conservation of the New Mexico meadow jumping mouse. The designation also proposes primary constituent elements (PCEs), which are the specific elements of physical or biological features that provide for a species' life-history processes and are essential to the conservation of the species.

PROPOSED ACTION

The Proposed Action is to designate eight geographic units as critical habitat for the New Mexico meadow jumping mouse (78 FR 37328). These units are within Bernalillo, Colfax, Mora, Otero, Rio Arriba, Sandoval, and Socorro Counties in New Mexico; Las Animas, Archuleta, and La Plata Counties in Colorado; and Greenlee and Apache Counties in Arizona. These critical habitat units contain features that the USFWS considers essential to the conservation of the species. The eight units are comprised of 23 subunits.

The USFWS decided that verified collections of the species between 2005 to 2012 would be used to identify the areas considered occupied by the New Mexico meadow jumping mouse at the time of listing. This timeframe was selected because no capture records of New Mexico meadow jumping mice were found between 1996 and 2005. For a detailed review of this assessment, see Chapter 3 of the May 2013 SSA Report (Service 2013) where the USFWS referenced historical records as those from the 1980s and 1990s and current records as those verified from 2005 to 2012. This assessment resulted in 29 locations of the New Mexico meadow jumping mouse considered occupied at the time of listing. Consequently, each of these 29 locations documented since 2005 occur within 1 of the 19 units or subunits (some units or subunits contain multiple occupied locations), and they were proposed as critical habitat for the New Mexico meadow jumping mouse. The USFWS found that the best available information supports considering these areas to be within the geographic area occupied by the New Mexico meadow jumping mouse at the time of listing.

Because the areas occupied by the mouse since 2005 do not contain enough suitable, connected habitat to support resilient populations of New Mexico meadow jumping mouse (Service 2013, Chapter 3), the USFWS found that it is essential for the conservation of the New Mexico meadow jumping mouse to expand its occupied habitats into areas considered currently unoccupied, but within its historical range. As a result, for each of the 19 areas (encompassing 29

locations) considered occupied, the USFWS proposed critical habitat units that include areas that are considered unoccupied adjacent to the occupied areas. Each of these units or subunits are considered "partially occupied" because they include some small areas that have been occupied by the species since 2005 and other larger areas upstream or downstream that are not known to be occupied by the New Mexico meadow jumping mouse at the time of listing, but contain some or all of the PCEs for the mouse. The currently occupied areas contain the essential PCEs (1 and 2), and may require special management considerations or protections to maintain those PCEs. The unoccupied areas are essential for the restoration of the essential PCEs (1, 2, 3, and 4) along streams and other waterways.

The USFWS also found four subunits (described under the Jemez Mountains, Sacramento Mountains, and middle Rio Grande Units below) are completely unoccupied, but are essential for the conservation of the New Mexico meadow jumping mouse.

BACKGROUND

CRITICAL HABITAT

PROVISIONS OF THE ESA

ESA Section 3(5)(A), defines critical habitat as, (i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the provisions of section 4 of the ESA, on which are found those physical or biological features (1) essential to the conservation of the species and (2) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed in accordance with the provisions of Section 4 of the ESA, upon the determination by the Secretary of the Interior that such areas are essential for the conservation of the species.

ESA Section 4(b)(2) states that designation of critical habitat will be made, "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact, of specifying any particular area as critical habitat." Section 4(a)(3) of the ESA states that critical habitat shall be designated to the maximum extent prudent and determinable and that such designation may be revised periodically as appropriate. A critical habitat designation also describes primary constituent elements (PCEs), which are the physical and biological features that help define critical habitat for a species.

The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners.

SECTION 4(B)(2) EXCLUSION PROCESS

Section 4(b)(2) of the ESA states the Secretary of the Interior may exclude any area from the critical habitat designation after considering the economic, national security, or other relevant impacts of designating the area as critical habitat or if the Secretary determines that the benefit of excluding the area exceeds the benefit of designating it as critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned.

SECTION 7 CONSULTATION

The primary means by which critical habitat designation may serve to protect the New Mexico meadow jumping mouse is through the section 7 consultation process. Section 7(a)(2) of the ESA requires federal agencies to consult with the USFWS to "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined to be critical." section 7 of the ESA does not apply to tribal, state, local, or private land unless there is a federal nexus (i.e., federal funding, authorization, or permitting).

A Federal agency responsible for a proposed action begins the section 7 consultation process by determining the effects of the proposed action on both listed species and designated critical habitat. If the federal action agency determines that there would be no effect on listed species or designated critical habitat, then no consultation is necessary.

If it is determined that the proposed federal action may affect a listed species or critical habitat, the federal action agency and the Service typically enter into informal section 7 consultation. Informal consultation is an optional process for identifying affected species and critical habitat, determining potential effects, and exploring ways to modify the action to remove or reduce adverse effects to listed species or critical habitat (50 CFR §402.13). The informal section 7 consultation process concludes in one of two ways: 1) the Service concurs in writing that the proposed action is not likely to adversely affect listed species or critical habitat; or 2) adverse impacts are likely to occur and formal consultation is initiated.

Formal consultation is initiated when it is determined that the proposed federal action is likely to adversely affect listed species or critical habitat (50 CFR Part 402.14). Formal consultation assesses whether the proposed federal action is likely to jeopardize the continued existence of a listed species or to destroy or adversely modify critical habitat (50 CFR Part 402.14[h]). Formal

consultation concludes with a biological opinion issued by the USFWS on whether the proposed federal action is likely to jeopardize the continued existence of a listed species or to destroy or adversely modify critical habitat (50 CFR Part 402.14[h]). Independent analyses are made under both the jeopardy and the adverse modification standards.

A "nonjeopardy" or "no adverse modification" opinion concludes consultation, and the proposed action may proceed under the ESA. The USFWS may prepare an incidental take statement with reasonable and prudent measures to minimize take of non-plant species and associated, mandatory terms and conditions that describe the methods for accomplishing the reasonable and prudent measures. Discretionary conservation recommendations may be included in a biological opinion based on the effects on the species. Conservation recommendations, whether they relate to the jeopardy or adverse modification standard, are discretionary actions recommended by the USFWS. These recommendations may minimize adverse effects on listed species or critical habitat, identify studies or monitoring, or suggest how action agencies can assist species under their own authorities and section 7(a)(1) of the ESA. There are no ESA section 9 prohibitions for critical habitat. Therefore, a biological opinion that concludes there is no anticipated destruction or adverse modification of critical habitat may contain conservation recommendations but would not include an incidental take statement, reasonable and prudent measures, or other terms and conditions.

In a biological opinion that results in a jeopardy or adverse modification conclusion, the USFWS develops mandatory reasonable and prudent alternatives to the proposed action. Reasonable and prudent alternatives are actions that the federal agency can take to avoid jeopardizing the continued existence of the species or adversely modifying the critical habitat. Reasonable and prudent alternatives may vary from minimal project changes to extensive redesign or relocation of the project, depending on the situations involved. Reasonable and prudent alternatives must be consistent with the intended purpose of the proposed action, and they also must be consistent with the scope of the federal agency's legal authority. Furthermore, the reasonable and prudent alternatives must be economically and technically feasible. A biological opinion that results in an adverse modification finding (but no jeopardy to the species) may include reasonable and prudent alternatives and conservation recommendations but no incidental take statement or associated reasonable and prudent measures and terms and conditions.

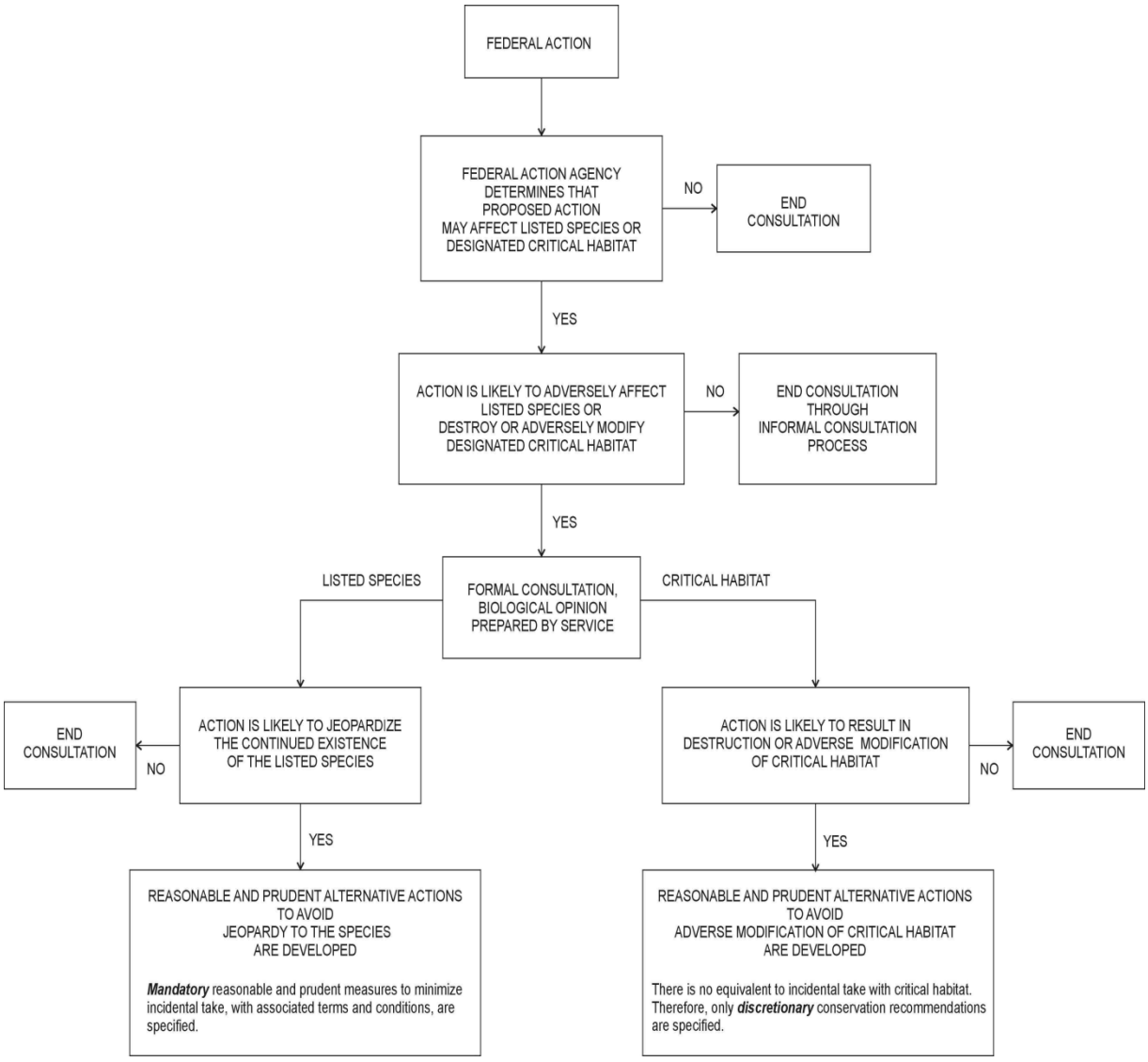

Figure 2. Simplified Diagram of the ESA section 7 consultation process.

NEW MEXICO MEADOW JUMPING MOUSE

SPECIES DESCRIPTION

The New Mexico meadow jumping mouse is dark yellowish brown, dark brown, and grayish-brown on the back, yellowish-brown on the sides, and white underneath (VanPelt 1993, Frey 2008). The subspecies grows to about 181 to 233 millimeters (mm) (7.1 to 9.2 inches(in)) in total length, with elongated feet (29.9 mm (1.2 in)) and an extremely long, bicolored tail (125.1 mm) (4.9 in)) (Hafner et al. 1981, VanPelt 1993, Frey 2008). It has been taxonomically reclassified a number of times and references to *Z. p. luteus* and *Z. l. australis* are synonymous with the New Mexico meadow jumping mouse (*Z. h. luteus*) (USFWS 2013b). However, recent genetic and morphological studies conclusively show the New Mexico meadow jumping mouse, *Zapus hudsonius luteus*, is a distinct subspecies (King et al. 2006, Vignieri et al. 2006, Frey 2008, Malaney et al. 2012). For more information on taxonomy of the subspecies see the draft SSA report (USFWS 2013b).

DISTRIBUTION

The New Mexico meadow jumping mouse is found in 29 locations in riparian areas containing suitable habitat throughout New Mexico, the White Mountains of Arizona, and Southern Colorado (USFWS 2013b). The ranges of the New Mexico meadow jumping mouse and the similar-looking western jumping mouse (*Zapus princeps*), overlap in the Sangre de Cristo and San Juan Mountains of southern Colorado and northern New Mexico (Frey 2011). The western jumping mouse is a common, widely distributed species that occurs in the southern Rocky Mountains of Colorado and New Mexico and uses a broader range of habitats (Frey 2011).

LIFE HISTORY

Life History of the New Mexico meadow jumping mouse is briefly summarized here; for more information see the draft species status assessment report (USFWS 2013b).

One of the most unusual and likely limiting aspects of the life history of the New Mexico meadow jumping mouse is its lengthy hibernation. The subspecies may hibernate eight to nine months a year, which is longer than most other mammals (Morrison 1987, Frey 2005). This lengthy period of inactivity greatly limits the amount of time they have available for meeting other life history needs. Jumping mice only have from May or June until September or October

each year available for breeding, raising young, feeding, and storing enough fat reserves to survive hibernation.

The breeding season probably begins in July or August, with one litter produced each year (Morrison 1987, 1989, Frey 2011, 2012b). Other jumping mice species (*Zapus* spp.) breed shortly after emerging from hibernation and may give birth to 2 to 7 young after an average 17 to 21 day gestation (Quimby 1951, Frey 2011). Young are fully developed and weaned at 4 weeks after birth (Morrison 1987, Van Pelt 1993). Females give birth and rear young in tall, dense riparian herbaceous vegetation that is outside the moist riparian zone. The female provides all the care for their young until they are weaned and independent.

Jumping mice (*Zapus* spp.) also must obtain enough food during the short active season to accumulate sufficient fat reserves required for over-winter survival. Individuals that enter hibernation with a low body mass do not survive, and up to 67 percent of individuals may perish during hibernation (Whitaker 1963, 1972). Studies of other species of jumping mice (*Zapus* spp.) show they have diets that are varied, consisting of seeds, insects, fruits, and fungi (Quimby 1951, Hoffmeister 1986, Morrison 1990). Morrison (1990) reported that jumping mice feed primarily on seeds of grasses and forbs, with seeds of sedges (*Carex* spp. or *Schoenoplectus pungens*), bulrush (*Scirpus* spp.), and cattail (*Typha latifolia*) infrequently eaten. Frey and Wright (2010, 2012) observed radio-collared jumping mice on Bosque del Apache National Wildlife Refuge (NWR), adjacent to the middle Rio Grande in New Mexico, feeding on the ground and in the herbaceous “canopy” 0.5 to 1 meters (1.6 to 3.3 feet) or more above the ground eating common threesquare (*Schoenoplectus pungens*), saltgrass (*Distichlis spicata*), spikerush (*Eleocharis macrostachya*), foxtail barley (*Hordeum jubatum*), Saunder’s wildrye (*Elymus saundersii*), Japanese brome (*Bromus japonicas*), slender wheatgrass (*Elymus trachycaulus*), and knotgrass (*Paspalum distichum*) .

HABITAT

The New Mexico meadow jumping mouse is a habitat specialist that requires tall, dense herbaceous (plants with no woody tissue) riparian (streamside) vegetation composed primarily of sedges and forbs (78 FR 37328). The subspecies appears to only utilize two wetland community types: 1) persistent emergent herbaceous wetlands; and 2) scrub-shrub wetlands (Muldavin *et al*. 2000 (Frey 2005, Frey 2011). Persistent emergent herbaceous wetlands are typically marshes with beaked sedge (*Carex rostrata*) and reed canarygrass (*Phalaris arundinacea*) vegetation community alliances. Scrub-shrub wetlands are riparian areas along perennial streams that are composed of woody species including willows (*Salix* spp.) and alders (*Alnus* spp.). The New Mexico meadow jumping mouse is an extreme habitat specialist that has different habitat

requirements for hibernation, rearing young, and all other activities. For hibernation, the New Mexico meadow jumping mouse uses hibernation nests in woody riparian areas. For raising young, females remain near a maternal nest that is located in woody riparian areas. For all other activities, the New Mexico meadow jumping mouse uses moist, streamside, dense riparian or wetland herbaceous vegetation (USFWS 2013b).

Hibernation nest requirements are poorly known. Only one hibernation nest has ever been observed for the New Mexico meadow jumping mouse (Wright and Frey 2011). The hibernaculum was below ground and beneath woody debris under a seep willow (*Baccharis* spp.) (Wright and Frey 2011). The site was dry, with an absence of herbaceous vegetation, which was similar to maternal nest sites selected by females (Morrison 1987, Wright and Frey 2011, Frey and Wright 2012). Frey (2011) suggests that hibernation sites are likely primarily below ground and associated with the base of shrubs and trees.

Maternal nests used for rearing young are located in drier riparian vegetation types dominated by riparian shrubs or trees. These nests are in areas devoid of lush green vegetation and are usually under fallen sticks and limbs from willow, cottonwood (*Populus deltoides*), and mesquite (*Prosopis* spp.) trees (Frey and Wright 2012). They are below ground and usually shaded by tree and shrub canopies (Frey and Wright 2012).

For all other activities the New Mexico meadow jumping mouse uses tall (average stubble height of herbaceous vegetation of at least 69 centimeters (cm) (27 in)) and dense riparian herbaceous vegetation that provides dense vertical cover from ground level up to 61 cm above the ground (Frey 2005, Frey 2011). The herbaceous vegetation is composed primarily of sedges (*Carex* spp. or *Schoenoplectus pungens*) and forbs. These include, but are not limited to, the following herbaceous species: spikerush, beaked sedge, reed canarygrass, rushes (*Juncus* spp. and *Scirpus* spp.), and numerous species of grasses such as bluegrass (*Poa* spp.), slender wheatgrass, brome (*Bromus* spp.), foxtail barley, or Japanese bromus, and forbs such as water hemlock (*Circuta douglasii*), field mint (*Mentha arvense*), asters (*Aster* spp.), or cutleaf coneflower (*Rudbeckia laciniata*).

The tall dense sedges or forbs used by jumping mice are found on saturated soils along the edge of open, permanent flowing water (Morrison 1990, Frey 2005a,). Seasonally available flowing waters are necessary to support the growth of tall, dense, riparian herbaceous plants. The soils may be covered by shallow (< 2 cm) standing water and are in proximity to drier soils or mats of vegetation that may be used for travel (Frey 2007, 2011). However, jumping mice are generally not found in areas along stagnant water and do not use areas that contain large expanses of uniformly deep (> 2 cm (0.8 in)) standing water (Morrison 1988, 1989), even when tall dense riparian herbaceous vegetation is present (Frey 2007b, 2011).

Jumping mice (*Zapus hudsonius*) use day nests for protection and resting. These nests are located within herbaceous riparian vegetation and constructed of leaves and other plant fibers from grasses, forbs, sedges, rushes (*Juncus* spp.), and other available plant material (Frey and Wright 2012). New Mexico meadow jumping mice use multiple day nests within herbaceous riparian vegetation (Frey and Wright 2011). Day nests have also been found above the ground near water within areas with no herbaceous canopy cover, in dense stands of saltgrass and other grasses (Frey and Wright 2012).

Historically, New Mexico meadow jumping mouse populations had access to larger areas of habitat than are currently available. Jumping mice need suitable habitat of sufficient size to support the natural fluctuations of populations as they expand and contract, to reduce the risk from local extirpation and extinction, and to attain the densities necessary to persist through catastrophic events and seasonal fluctuations of food resources (USFWS 2013b). After reviewing the information on historical and current distribution, the USFWS has concluded that current New Mexico meadow jumping mouse populations need connected areas of suitable habitat along at least 9 to 24 km (5.6 to 15 mi) of continuous suitable habitat to support viable populations of jumping mice with a high likelihood of long-term persistence (USFWS 2013b).

Historic riparian habitat was not only more abundant, but also more contiguous. Contiguous habitat along riparian areas enable young to disperse, facilitate genetic interchange, and facilitate movement to other riparian areas when catastrophic events such as flooding or fire destroy local patches. Connectivity between patches of suitable habitat is necessary to facilitate daily and seasonal movements, and dispersal to increase the likelihood of long-term viability of New Mexico meadow jumping mouse populations (USFWS 2013b).

PRIMARY CONSTITUENT ELEMENTS FOR THE NEW MEXICO MEADOW JUMPING MOUSE

To develop the PCEs, USFWS relied heavily on the analysis of biological information reviewed in the Draft Species Status Assessment Report (USFWS 2013b).The primary constituent elements specific to the New Mexico meadow jumping mouse consist of the following (78 FR 37328):

> (1) Riparian communities along rivers and streams, springs and wetlands, or canals and ditches characterized by one of two wetland vegetation community types:
>
> > (a) Persistent emergent herbaceous wetlands dominated by beaked sedge (*Carex rostrata*) or reed canarygrass (*Phalaris arundinacea*) alliances; or

(b) Scrub-shrub riparian areas that are dominated by willows (*Salix* spp.) or alders (*Alnus* spp.); and

(2) 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 69 cm (27 inches) and dense herbaceous riparian vegetation (cover averaging at least 61 vertical cm (24 inches) 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*), reed canarygrass (*Phalaris arundinacea*), 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 arvense*), asters (*Aster* spp.), or cutleaf coneflower (*Rudbeckia laciniata*); and

(3) 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

(4) Include adjacent floodplain and upland areas extending approximately 100 m (330 ft) outward from the water's edge (as defined by the bankfull stage of streams).

RELATED LAWS, AUTHORIZATIONS, AND PLANS

FEDERAL LAWS, AUTHORIZATIONS, AND PLANS

The National Forest Management Act of 1976 (16 USC §1600 et seq.) directs the U.S. Forest Service (Forest Service) to prepare programmatic-level management plans to guide long-term resource management decisions. In addition, the Forest Service is required to manage habitat to maintain viable populations of existing native and desired nonnative vertebrate species in planning areas (36 CFR §219.19). The New Mexico meadow jumping mouse has been on the Regional Forester's Region 3 Sensitive Species List since 1990 (Forest Service 1999). This means the species is considered in land management decisions, but no specific protective measures are conveyed. The Santa Fe, Carson, Lincoln, and Apache-Sitgreaves National Forests contain occupied habitat for the New Mexico meadow jumping mouse. The Forest Service policy (FSM 2670.3) states that Biological Evaluations must be completed for sensitive species and signed by a journey-level biologist or botanist. To date, the Forest Service has completed very few actions specific to the New Mexico meadow jumping mouse to conserve or avoid impacts to the species or its habitat.

The U.S. Army Corps of Engineers (COE) regulates the discharge of fill material to waters of the United States, including New Mexico meadow jumping mouse habitat, pursuant to Section 404 of the Clean Water Act, and issues permits for actions proposed within such waters. Jurisdictional, nontidal waters of the United States regulated by the COE are defined in 33 CFR 328.4(c) as those that comprise the area of a water course that extends up to the ordinary high-water mark.

The U.S. Bureau of Land Management (BLM) manages six acres (less than 1%) of the proposed Florida River, Colorado, critical habitat unit. The BLM Colorado State Director's Sensitive Species list includes the New Mexico meadow jumping mouse. BLM State Directors are responsible for developing and implementing procedures for the conservation of special status species on BLM-administered lands within their states (Bureau of Land Management 2008).

The Federal Land Policy and Management Act of 1976 requires that ". . . the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that. . . will preserve and protect certain public lands in their natural condition; (and) that will provide food and habitat for fish and wildlife . . ." Furthermore, it is the policy of the Bureau of Land Management" to manage habitat with emphasis on ecosystems to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on public lands" (BLM manual 6500.06).

There is one National Wildlife Refuge within proposed critical habitat for the New Mexico meadow jumping mouse, Bosque del Apache NWR; it occurs within New Mexico. Section 7(a) of the ESA requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated. The USFWS has completed one informal conference with Bosque del Apache NWR on an action that may affect the New Mexico meadow jumping mouse. National Wildlife refuges are managed under the direction of Coordinated Conservation Plans (CCPs). The CCP for Bosque del Apache NWR is currently being updated and includes actions that benefit the habitat and needs of the New Mexico meadow jumping mouse.

STATE WILDLIFE LAWS, AUTHORIZATIONS, AND PLANS

Arizona - The AGFD has included the New Mexico meadow jumping mouse in Wildlife of Special Concern in Arizona (WSCA) (Arizona Game and Fish Department 1996). The March 16, 1996, version of WSCA list identifies wildlife in Arizona that are regarded as extinct, extirpated, endangered, or threatened from a state perspective (Arizona Game and Fish Department 1996).

The New Mexico meadow jumping mouse is listed as a threatened species on the WSCA (Arizona Game and Fish Department 1996). The WSCA list is used by AGFD cooperators and outside contractors for projects developed and reviewed for environmental compliance under the NEPA, the Act, and other Federal laws. However, this designation provides no regulatory protection for the New Mexico meadow jumping mouse in Arizona because the WSCA list does not address habitat protection, indirect effects, or other threats to this species. The Arizona Game and Fish Department's State Wildlife Action Plan identifies the New Mexico meadow jumping mouse as a tier 1A (highest priority) "Species Of Greatest Conservation Need" (Arizona Game and Fish Department 2012).

New Mexico - New Mexico State law provides some protection to the New Mexico meadow jumping mouse. In 2006, the New Mexico Department of Game and Fish (NMDGF) reclassified the New Mexico meadow jumping mouse from threatened to endangered under state law, after they determined that the most immediate threat to the species was from a substantial reduction in vegetation along streams in areas of historic occurrence due to drought and excessive livestock grazing (New Mexico Department of Game and Fish 2006). Endangered status under New Mexico State law was reaffirmed recently based on continuing threats (New Mexico Department of Game and Fish 2012). This designation provides protection under the New Mexico Wildlife Conservation Act of 1974 (i.e., State Endangered Species Act) (19 NMAC 33.6.8) by prohibiting direct take of the species without a permit issued from the State. The New Mexico Wildlife Conservation Act defines "take" or "taking" as harass, hunt, capture, or kill any wildlife or attempt to do so (17 NMAC 17.2.38). New Mexico's classification as an endangered species only conveys protection from collection or harm to the animals themselves without a permit. New Mexico's statutes are not designed to address habitat protection, indirect effects, or other threats to this species. There is no provision to address the habitat requirements of the species. The Wildlife Conservation Act (N.M. Stat. Ann. §§ 17-2-37-46 (1995)) states that, to the extent practicable, recovery plans shall be developed for species listed by the State as threatened or endangered. Although the New Mexico State statutes require the NMDGF to develop a recovery plan that will restore and maintain habitat for the species, the species does not have a finalized recovery plan, conservation plan, or conservation agreement (New Mexico Department of Game and Fish 2006). The NMDGF began developing a recovery plan for the subspecies but did not complete it (NMDGF 2008). We do not expect that the draft recovery plan will be completed in the near future because NMDGF has informed us that they plan on adopting our recovery plan when and if the species becomes federally listed.

Colorado - The Colorado Division of Wildlife's (CDOW) Comprehensive Wildlife Conservation Strategy lists the New Mexico meadow jumping mouse as a Species Of Greatest Conservation Need, Tier 1 (Colorado Division of Wildlife 2006). As such, the New Mexico meadow jumping mouse is considered threatened under the nongame provisions of the CDOW, and can only be

taken legally by permitted personnel for educational, scientific, or rehabilitation purposes. This designation provides no regulatory protection for the habitat of the New Mexico meadow jumping mouse in Colorado.

ISSUES FROM PUBLIC COMMENTS ON PROPOSED RULE

The following issues associated with designation of critical habitat were identified in written and recorded oral comments received during the public comment period on the proposed rule to designate critical habitat for the New Mexico meadow jumping mouse (78 FR 37328).

- Energy development could be impacted by designation of critical habitat.
- The action will cause significant economic and social impacts.
- The designation of critical habitat could affect agricultural production, particularly haying.
- The designation of critical habitat could affect livestock grazing.
- The designation of critical habitat could affect private land use.
- The designation of critical habitat could increase costs to manage Lemon Reservoir.
- The designation of critical habitat could affect water diversions in the Middle Rio Grande.
- The designation of critical habitat could impact irrigators that rely on federal, state, or private water projects.
- Designation of critical habitat could undermine the Middle Rio Grande recovery program.
- Designation of critical habitat could affect angling opportunities.
- Ohkay Owingeh requests that it be excluded from the designation.
- Isleta Pueblo requests that it be excluded from the designation.
- Effects on small businesses should be analyzed.

TOPICS ANALYZED IN DETAIL IN THIS ENVIRONMENTAL ASSESSMENT

Several resources have been identified as potentially affected by the proposed designation during internal scoping and the issues identified by public comments. These resources are analyzed in Chapter 3.0 as follows:

1. Fish, wildlife, and vegetation
    a. Threatened, endangered, and sensitive species
    b. Birds of conservation concern

   c. Migratory birds
   d. Bald and golden eagles
   e. Common fish and wildlife
   f. Vegetation
2. Floodplains and wetlands
3. Water use and management
4. Agriculture
5. Livestock grazing
6. Fire management
7. Highway construction and reconstruction
8. Development
9. Energy resources
10. Recreation
11. Cultural or historic resources
12. Socioeconomics
13. Environmental justice

TOPICS DISMISSED FROM DETAILED ANALYSIS

Federal regulations (40 CFR §1500 et seq.) require that certain topics be addressed as part of a NEPA analysis. The USFWS reviewed the mandatory topics listed below and determined that the proposed action has no potential to affect them. These topics have been dismissed from detailed analysis in this document.

ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Critical habitat designation for the New Mexico meadow jumping mouse is not likely to increase energy consumption.

URBAN QUALITY AND DESIGN OF THE BUILT ENVIRONMENT

The proposed critical habitat segments specifically exclude urban or other built environments by text and therefore would not affect the quality of such environments.

PUBLIC HEALTH AND SAFETY

Actions taken to protect and manage critical habitat for the New Mexico meadow jumping mouse would not introduce dangers likely to threaten public health or safety.

CLIMATE CHANGE

Climate change could have an effect of unknown strength on the species. However, any effects of designation of critical habitat on climate change are likely to be insignificant.

Conservation actions taken to recover the population may involve driving, which would increase production of greenhouse gasses. However, the production would be so minor compared to other sources of greenhouse gasses, the conservation actions would not contribute to climate change. It is unlikely that designation of critical habitat would result in conservation actions being taken in addition to the actions taken for recovering the population. Therefore the impact of critical habitat designation on climate change would be insignificant.

ECOLOGICALLY CRITICAL AREAS, WILDERNESS, WILD AND SCENIC RIVERS, OR OTHER UNIQUE NATURAL AREAS

Bear Wallow Wilderness, Escudilla Wilderness, and Mount Baldy Wilderness are each near Unit 5 (White Mountains). Indian Wells Wilderness and Little San Pascual Wilderness are each near Unit 6C (Bosque del Apache). Critical habitat designation will not affect these wilderness areas because it will not cause actions that would affect wilderness character.

No Areas of Critical Environmental Concern, or other unique natural areas occur within the area.

East Fork of the Jemez River, which is approximately 4 miles southeast of Subunit 3A is the closest Wild and Scenic River to any of the critical habitat units and would not be affected by the critical habitat designation.

CHAPTER 2: ALTERNATIVES

DEVELOPMENT OF ALTERNATIVES

The USFWS used the best scientific and commercial data available to propose areas for critical habitat within the geographical area occupied at the time of listing that contain the features essential to the conservation of the New Mexico meadow jumping mouse. The USFWS also considered all comments received from agencies and the public on the proposed rule for designating critical habitat for the New Mexico meadow jumping mouse.

ALTERNATIVE A: NO ACTION ALTERNATIVE

The No Action alternative is defined as no designation of critical habitat for the New Mexico meadow jumping mouse. An analysis of a No Action Alternative is required by NEPA, and provides a baseline for analyzing effects of the action alternatives. However, it is not clear that USFWS could, under the law, adopt the No Action alternative. The ESA specifies that USFWS must designate critical habitat to the maximum extent prudent and determinable. Our proposed rule indicates that critical habitat is both prudent and determinable. However, analysis of this alternative describes the existing environment and consequences that are anticipated as a result of the proposed listing of the species without the designation of critical habitat.

ALTERNATIVE B: CRITICAL HABITAT DESIGNATION

Alternative B is the critical habitat designation described in the June 20, 2013, proposed rule (78 FR 37328). Under this alternative approximately 5843 ha (14,432 ac) would be designated as critical habitat for the New Mexico meadow jumping mouse in the states of Colorado, New Mexico, and Arizona (figures 1-11). The units proposed as critical habitat and the approximate area of each proposed critical habitat unit and land ownership are shown in Table 1. Detailed descriptions of each unit are found in the proposed rule to designate critical habitat (78 FR 37328). The USFWS considers the 29 locations where the New Mexico meadow jumping mouse has been found since 2005 to be within the geographic area occupied at the time of listing. These 29 locations are considered occupied areas. All occupied areas have PCE 1 (appropriate wetland vegetation communities) and PCE 2 (flowing water with tall herbaceous vegetation).

The eight proposed critical habitat units are described in detail in 78 FR 37328. Unit 1, Sugarite Canyon, consists of 344 ha (849 ac) along 13.0 km (8.1 mi) of streams on areas owned by the States of Colorado and New Mexico. The Colorado streams areas are found within Las Animas County, Colorado, and the New Mexico stream areas are found within Colfax County, New Mexico. Unit 2, Coyote Creek, consists of 239 ha (590 ac) along 11.8 km (7.4 mi) of Coyote Creek on private lands and an area owned by the State of New Mexico within Mora County. Unit

3, Jemez Mountains, consists of 1,118 ha (2,761 ac) of streams within three subunits on private lands and areas owned by the Forest Service and the State of New Mexico within Sandoval County, New Mexico. Unit 4, Sacramento Mountains, consists of 777 ha (1,920 ac) of streams within five subunits on private lands and areas owned by the Forest Service within Otero County, New Mexico. Unit 5, White Mountains, consists of 2,448 ha (6,047 ac) of streams within eight subunits on private lands and areas owned by the Forest Service and the State of Arizona within Greenlee and Apache Counties, Arizona. Unit 6, Middle Rio Grande, consists of 586 ha (1447ac) of streams, ditches, and canals within three subunits of streams on lands owned by Isleta Pueblo, Bernalillo County; Ohkay Owingeh, Rio Arriba County; and the Service's Bosque del Apache NWR, Socorro County, New Mexico. Unit 7, Florida River, consists of 256 ha (634 ac) along 13.6 km (8.4 mi) of the Florida River on private lands and an area owned by the Bureau of Land Management, La Plata County, Colorado. Unit 8, Sambrito Creek, consists of 75 ha (184 ac) along 4.6 km (2.9 mi) of Sambrito Creek on private lands and areas owned by the State of Colorado within Navajo State Park, near Arboles, Archuleta County, Colorado.

Each of the 19 proposed critical habitat subunits containing the occupied areas also contain unoccupied areas that USFWS has concluded are essential for the conservation of the New Mexico meadow jumping mouse. We describe these units containing both occupied and unoccupied areas within the same stream reach as "partially occupied" (Table 1). Four other subunits (3-C Rio de las Vacas, 4-B Upper Rio Peñasco, 6-A Isleta Pueblo, and 6-B Ohkay Owingeh 3-C) are considered completely unoccupied. The 19 proposed partially occupied critical habitat subunits include unoccupied areas that are upstream or downstream of the occupied areas, but do not currently have the necessary vegetation to protect New Mexico meadow jumping mice from predators or to provide food sources. All of these completely or partially unoccupied areas currently have flowing water to allow for future restoration of the essential PCEs 1 and 2, but also PCE 3—sufficient areas of streams, ditches or canals; and PCE 4—adjacent floodplain and upland areas that would collectively provide the needed physical and biological features of habitat required to sustain the species' life-history processes. The USFWS has concluded that all of the unoccupied areas, whether they are within partially or completely unoccupied proposed units, are essential to the conservation of the New Mexico meadow jumping mouse (78 FR 37328).

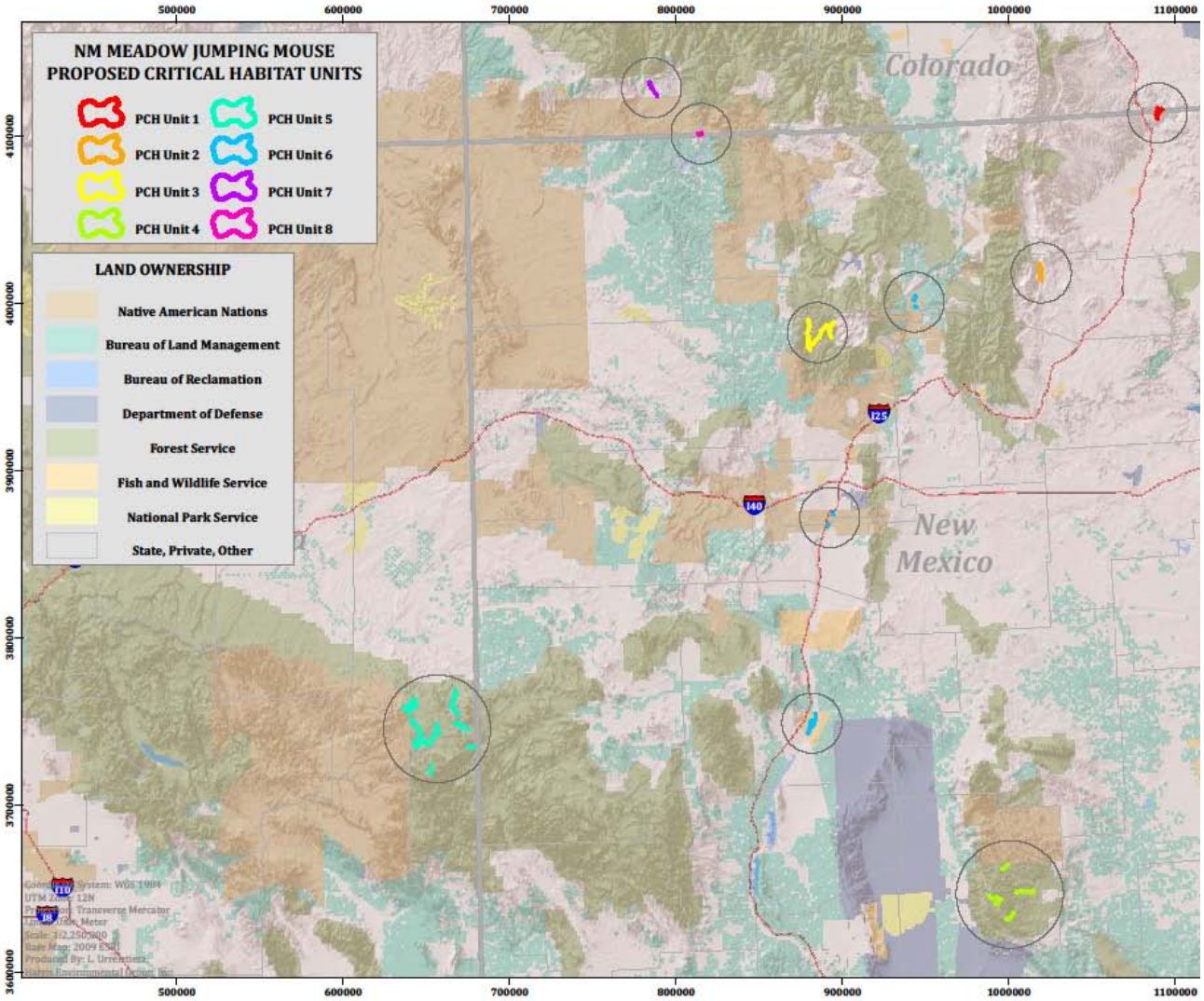

Figure 1. Proposed critical habitat units for the New Mexico meadow jumping mouse.

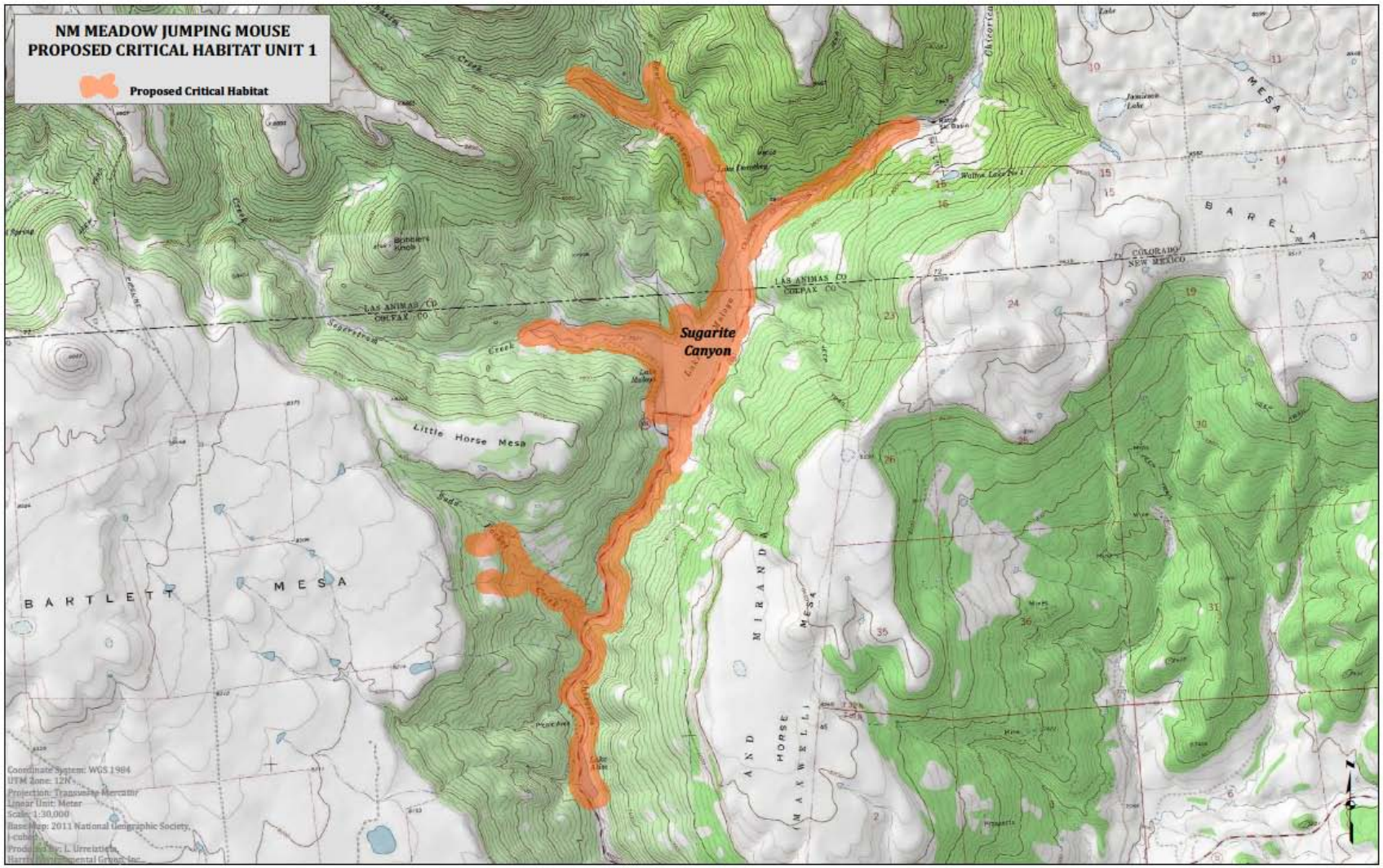

Figure 2. Proposed Sugarite Canyon critical habitat unit (Unit 1).

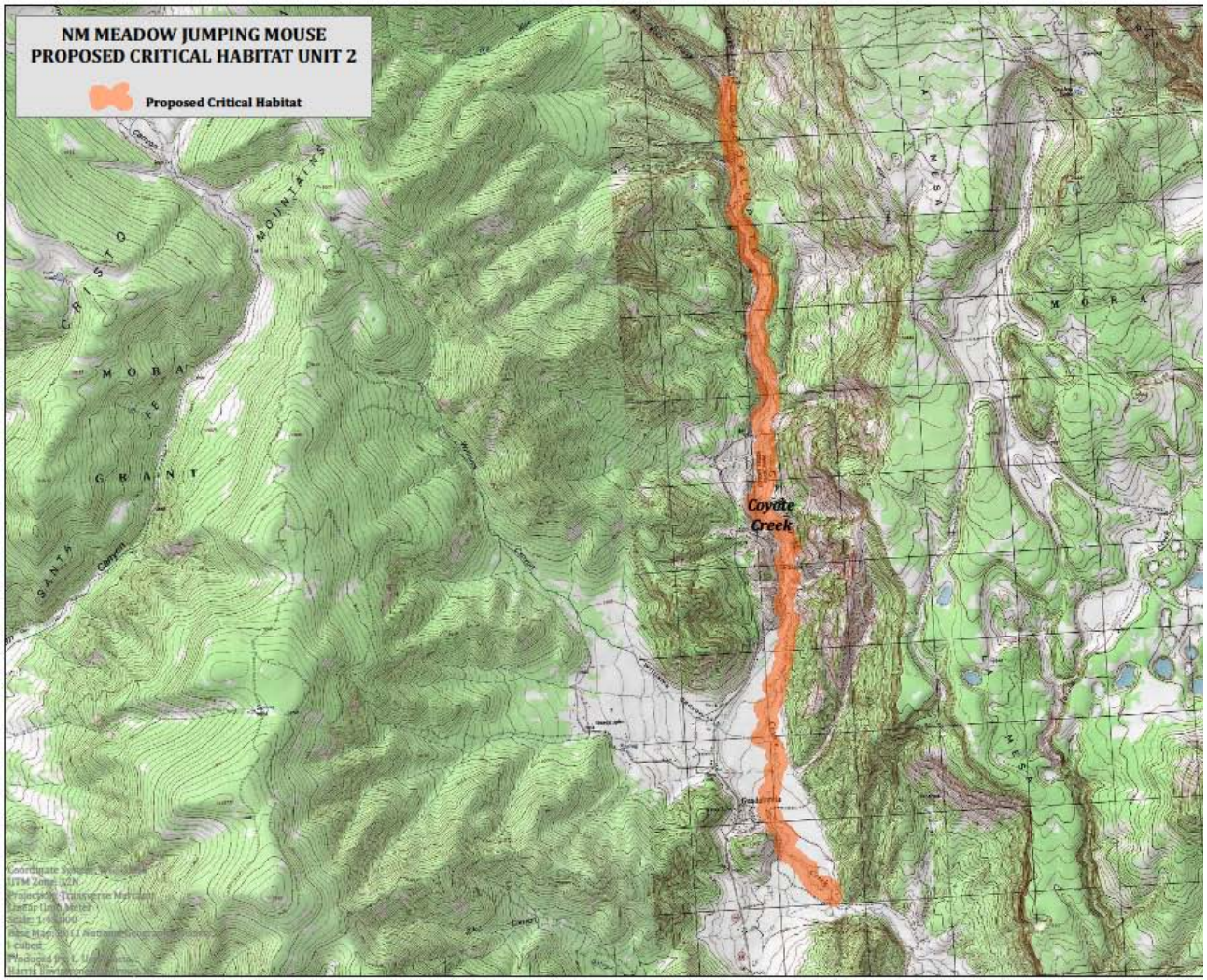

Figure 3. Proposed Coyote Creek critical habitat unit (Unit 2).

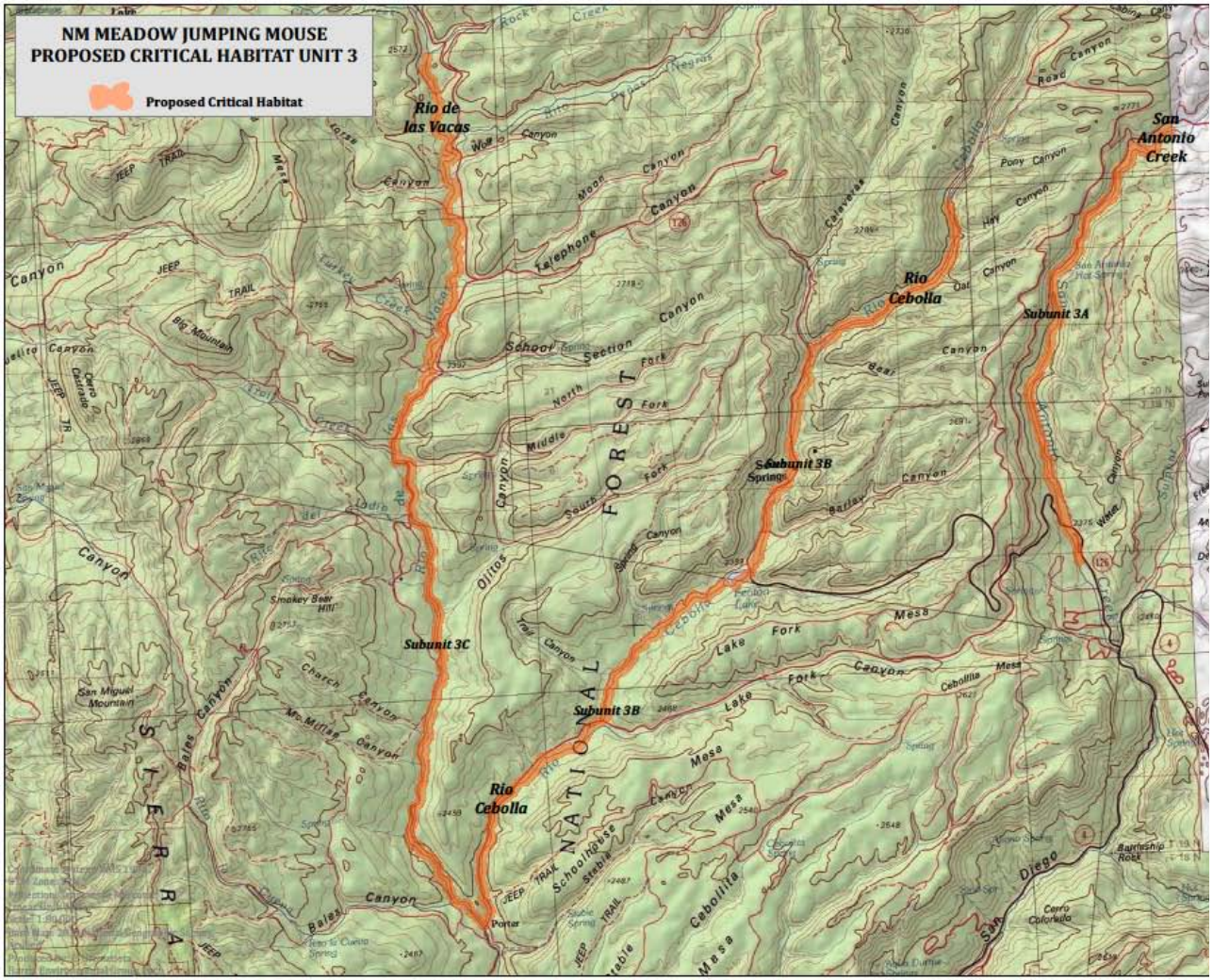

Figure 4. Proposed Jemez Mountains critical habitat unit (Unit 3).

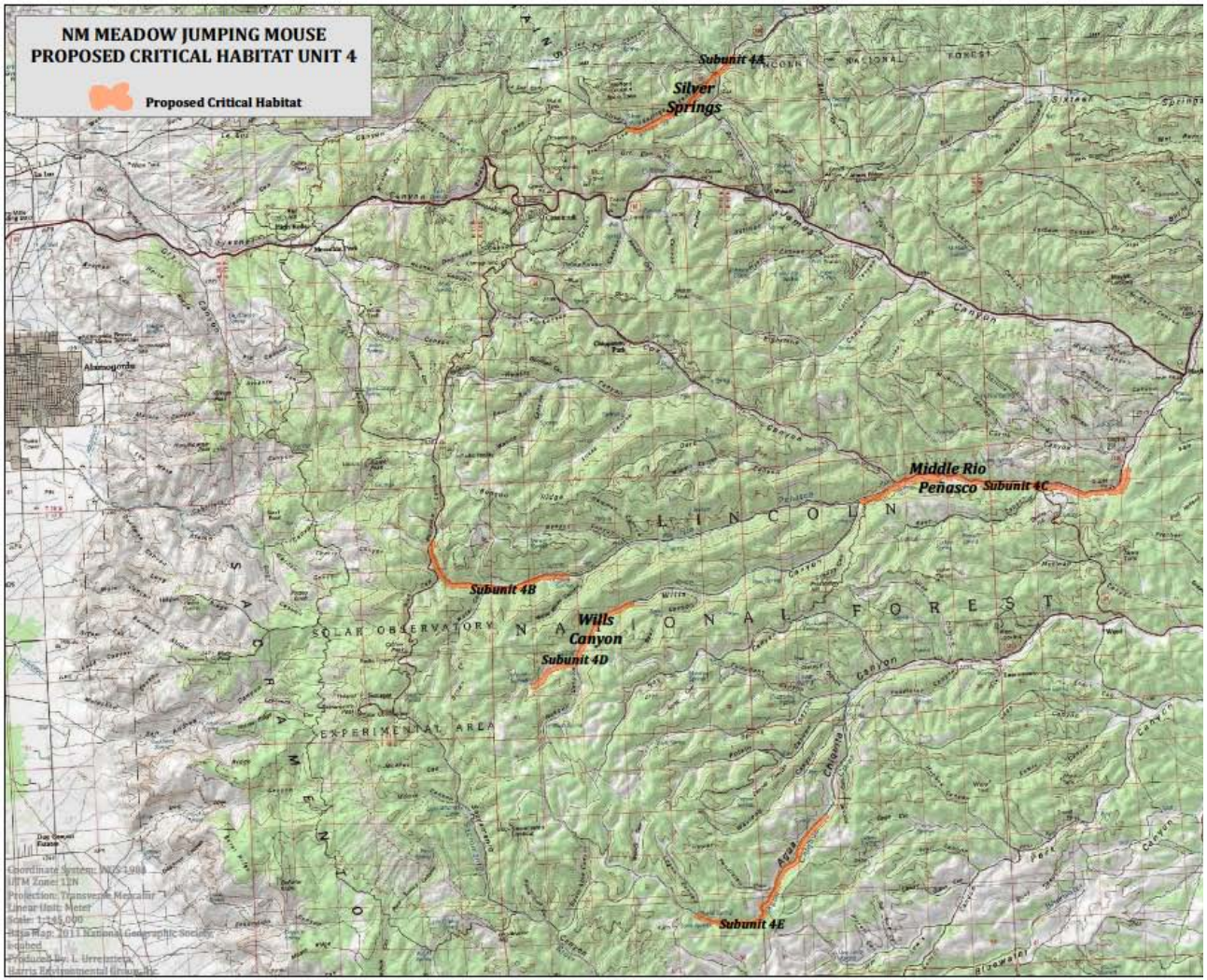

Figure 5. Proposed Sacramento Mountains critical habitat unit (Unit 4).

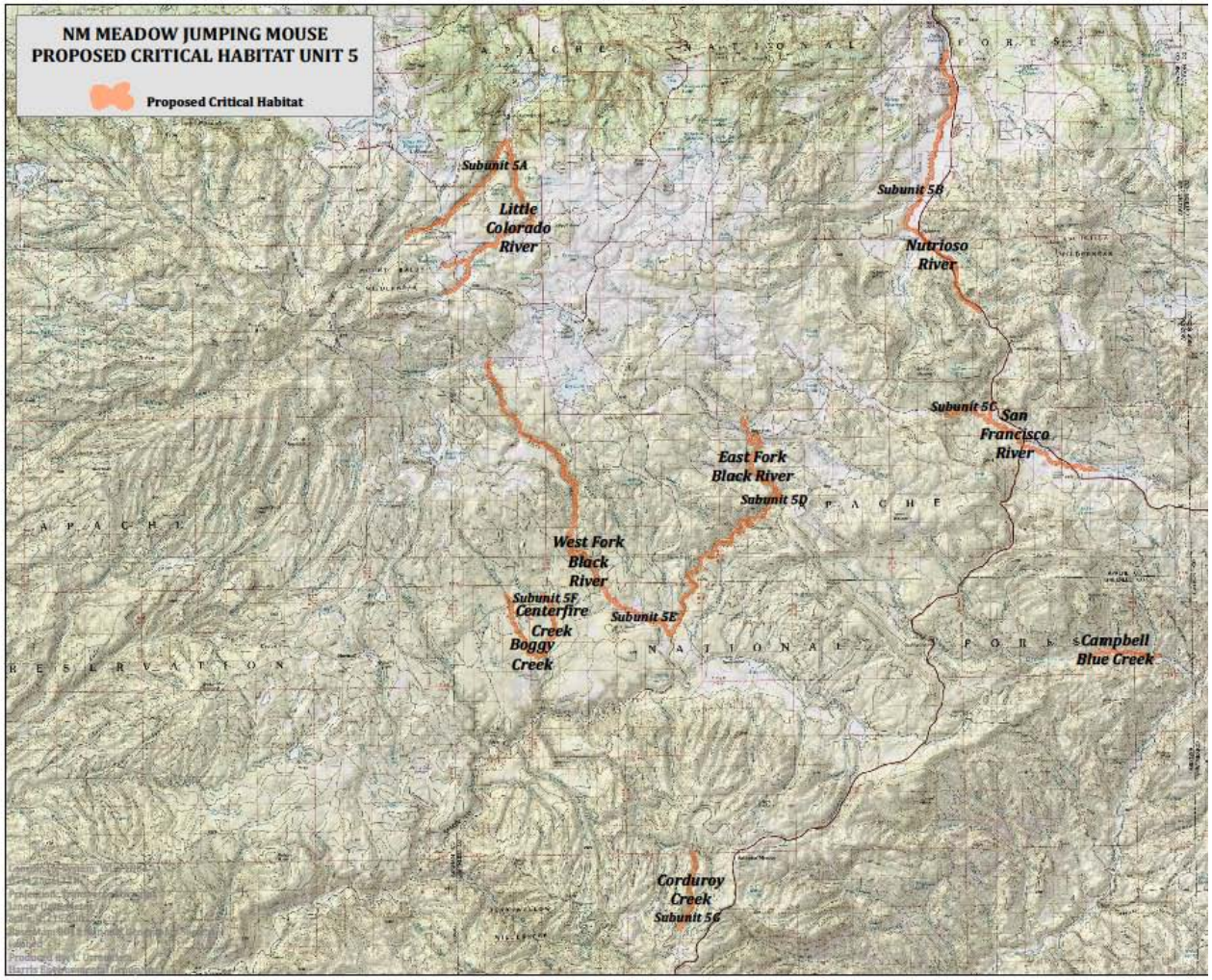

Figure 6. Proposed White Mountains critical habitat unit (Unit 5).

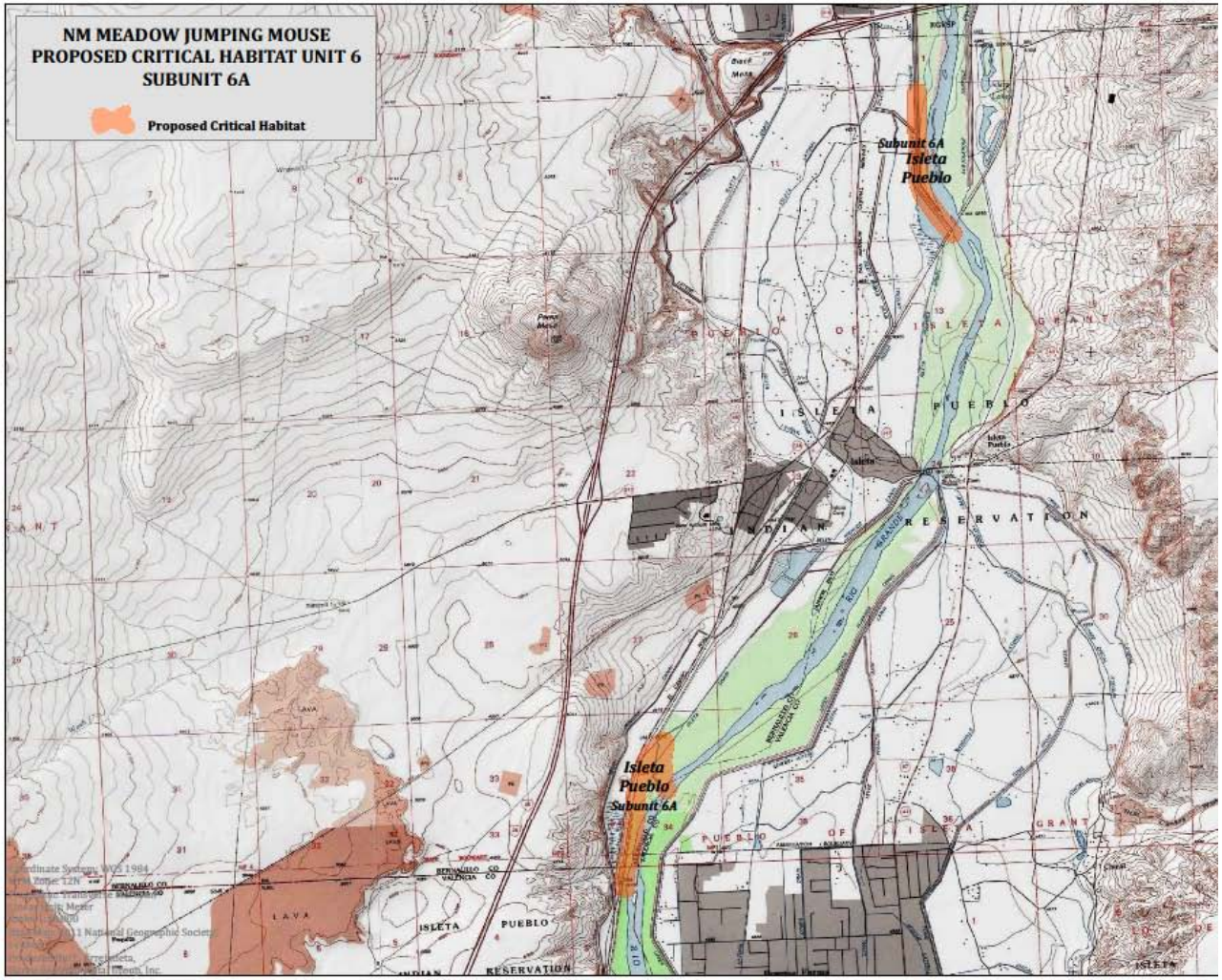

Figure 7. Proposed Isleta Pueblo subunit (Subunit 6a), Middle Rio Grande critical habitat unit.

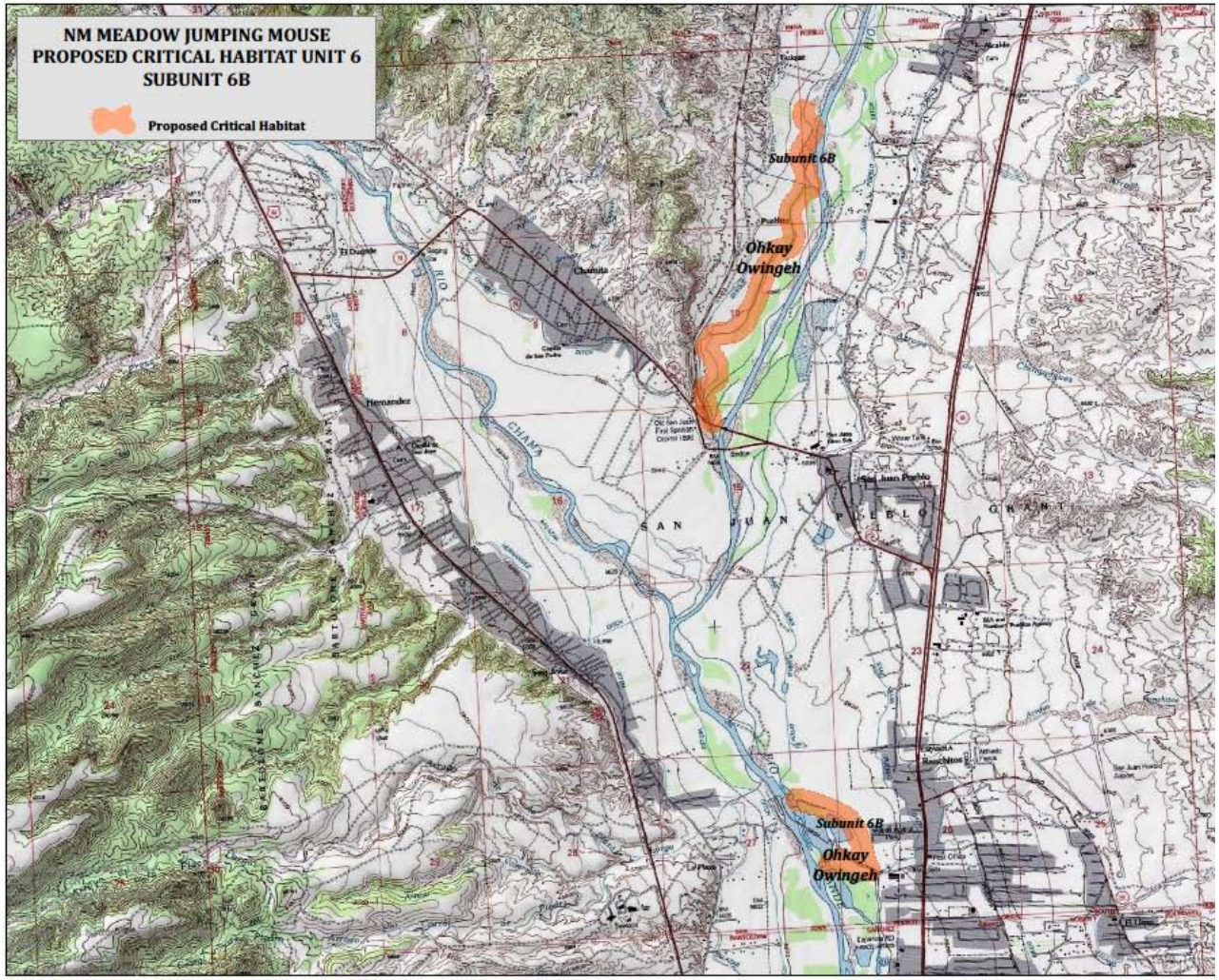

Figure 8. Proposed Ohkay Owingeh subunit (Subunit 6b), Middle Rio Grande critical habitat unit.

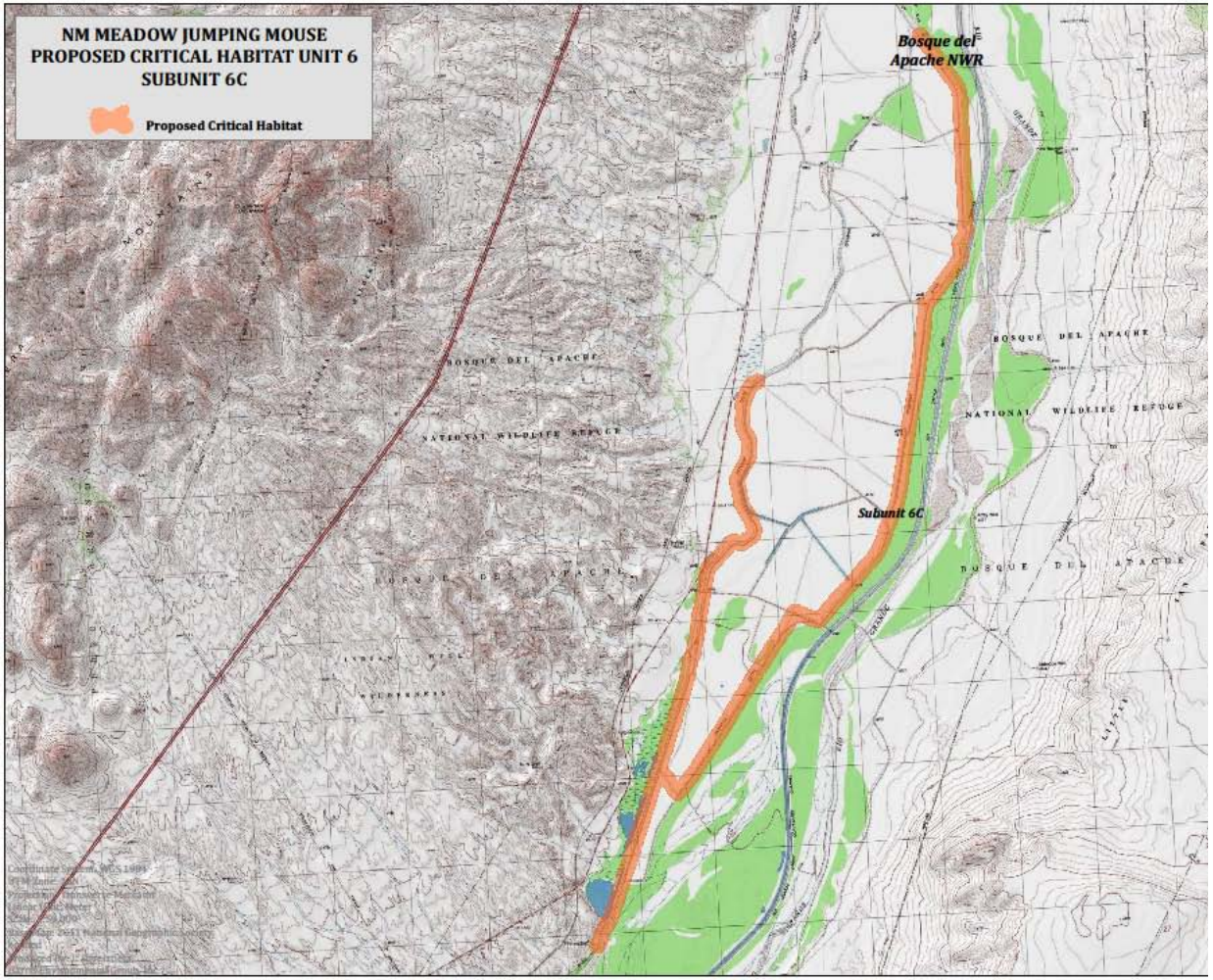

Figure 9. Proposed Bosque del Apache subunit (Subunit 6c), Middle Rio Grande critical habitat unit.

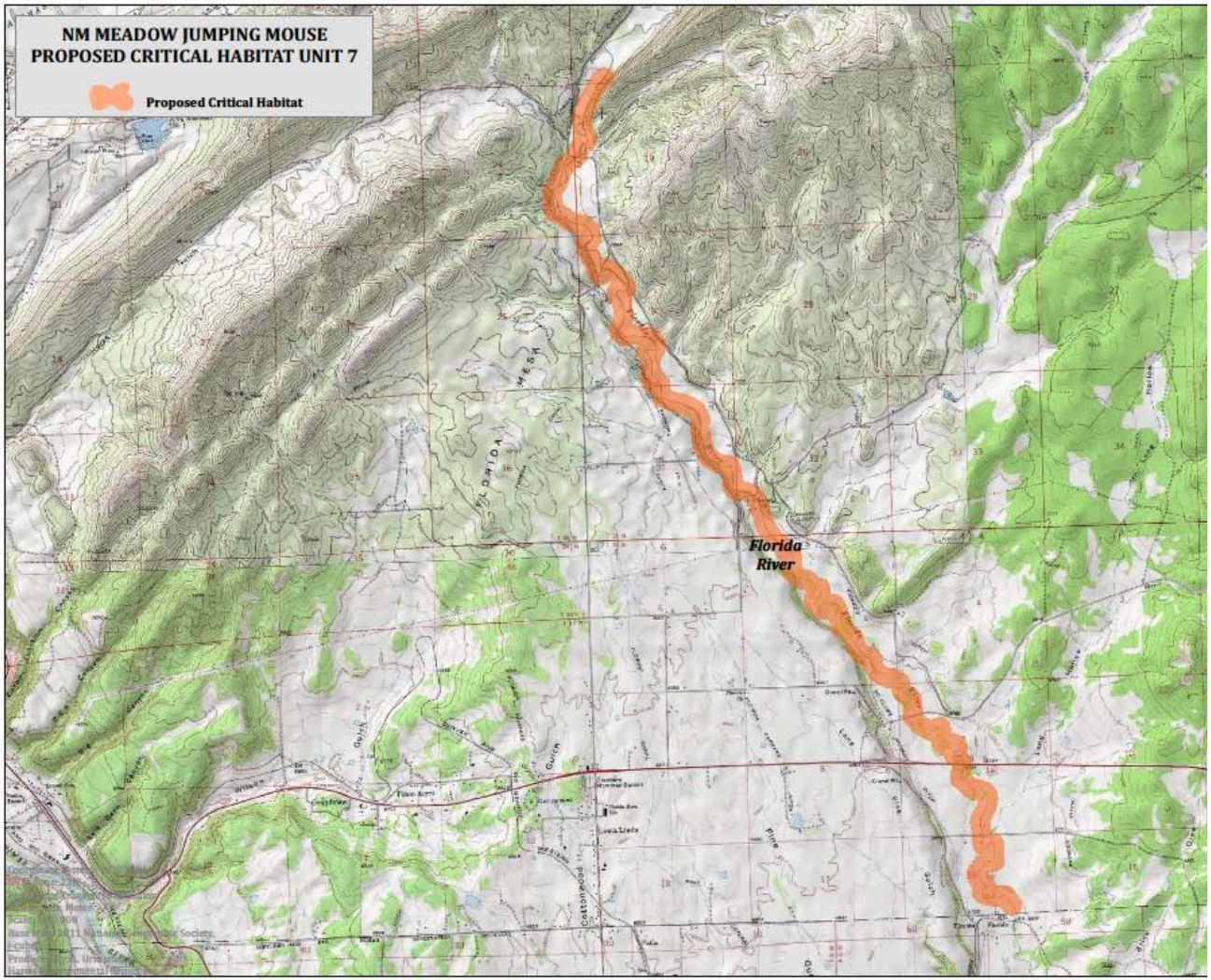

Figure 10. Proposed Florida River critical habitat unit (Unit 7).

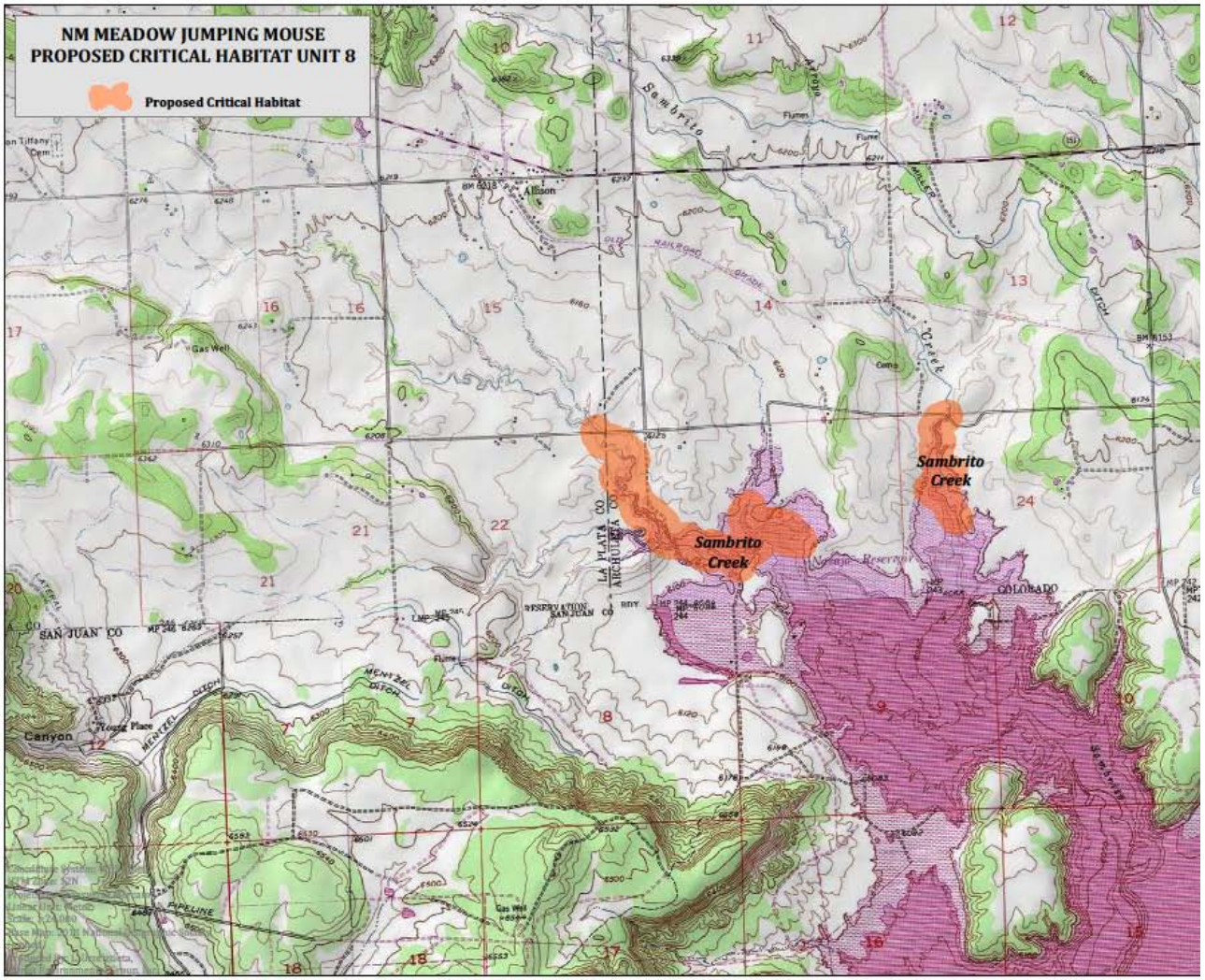

Figure 11. Proposed Sambrito Creek critical habitat unit (Unit 8).

Table 1. Critical habitat units and subunits proposed for New Mexico meadow jumping mouse.

Stream segment	**Occupied at the Time of Listing**	**Land Ownership**	**Length of Unit, km (mi)**	**Area, ha (ac)**
Unit 1–Sugarite Canyon				
Chicorica Creek	Partial	State of New Mexico State of Colorado		229 (567) 114 (282)
Total Unit 1			13.0 (8.1)	344 (849)
Unit 2–Coyote Creek				
Coyote Creek	Partial	State of New Mexico Private		26 (64) 213 (527)
Total Unit 2			11.8 (7.4)	239 (590)
Unit 3–Jemez Mountains				
Subunit 3A–San Antonio				
San Antonio Creek	Partial	Forest Service Private Other Federal Agency		223 (550) 10 (26) 1 (3)
Total Subunit 3A			11.5 (7.1)	234 (579)
Unit 3B–Rio Cebolla				
Rio Cebolla	Partial	Forest Service Private State of New Mexico		278 (686) 76 (187) 76 (187)
Total Subunit 3B			20.7 (12.9)	429 (1060)
Unit 3C–Rio de las Vacas				
Rio de las Vacas	No	Forest Service Private		332 (820) 122 (302)
Total Subunit 3C			23.3 (14.5)	454 (1122)
Total Unit 3			55.5 (34.5)	1118 (2761)
Unit 4–Sacramento Mountains				

Stream segment	**Occupied at the Time of Listing**	**Land Ownership**	**Length of Unit, km (mi)**	**Area, ha (ac)**
Subunit 4A–Silver Springs				
Silver Springs Creek	Partial	Forest Service Private		28 (70) 77 (190)
Total Subunit 4A			5.2 (3.2)	105 (260)
Subunit 4B–Upper Peñasco				
Rio Peñasco	No	Forest Service Private		18 (44) 118 (291)
Total Subunit 4B			6.4 (4.0)	136 (335)
Subunit 4C–Middle Peñasco				
Rio Peñasco	Partial	Forest Service Private		26 (65) 238 (587)
Total Subunit 4C			11.4 (7.1)	264 (652)
Subunit 4D–Wills Canyon				
Mauldin Springs	Partial	Forest Service Private		65 (162) 46 (113)
Total Subunit 4D			5.5 (3.4)	111 (275)
Subunit 4E–Agua Chiquita Canyon				
Agua Chiquita Creek	Partial	Forest Service		161 (398)
Total Subunit 4E			7.7 (4.8)	161 (398)
Total Unit 4			36.2 (22.5)	777 (1920)
Unit 5–White Mountains				
Subunit 5A–Little Colorado				
Little Colorado River	Partial	Forest Service Private		445 (1100) 33 (81)
Total Subunit 5A			22.6 (14.0)	478 (1181)
Subunit 5B–Nutrioso				

Stream segment	**Occupied at the Time of Listing**	**Land Ownership**	**Length of Unit, km (mi)**	**Area, ha (ac)**
Nutrioso River	Partial	Forest Service Private		142 (351) 271 (670)
Total Subunit 5B			20.4 (12.7)	413 (1021)
Subunit 5C–San Francisco				
San Francisco River	Partial	Forest Service Private		68 (167) 184 (455)
Total Subunit 5C			11.8 (7.3)	252 (622)
Subunit 5D–East Fork Black				
East Fork Black River	Partial	Forest Service		421 (1040)
Total Subunit 5D			20.3 (12.6)	421 (1040)
Subunit 5E–West Fork Black				
West Fork Black River	Partial	Forest Service Private State of Arizona		415 (1025) 17 (43) 49 (120)
Total Subunit 5E			23.0 (14.3)	481 (1188)
Subunit 5F–Boggy and Centerfire				
Boggy and Centerfire Creeks	Partial	Forest Service		197 (485)
Total Subunit 5F			8.9 (5.5)	197 (485)
Subunit 5G–Corduroy				
Corduroy Creek	Partial	Forest Service		104 (256)
Total Subunit 5G			4.8 (3.0)	104 (256)
Subunit 5H–Campbell Blue				
Campbell Blue Creek	Partial	Forest Service Private		100 (247) 2 (6)
Total Subunit 5H			4.8 (3.0)	102 (253)

Stream segment	**Occupied at the Time of Listing**	**Land Ownership**	**Length of Unit, km (mi)**	**Area, ha (ac)**
Total Unit 5			116.6 (72.4)	2448 (6047)
Unit 6–Middle Rio Grande				
Subunit 6A–Isleta Marsh				
Marsh	No	Isleta Pueblo	3.7 (2.3)	80 (197)
Subunit 6B–Ohkay Owingeh				
Marsh	No	Ohkay Owingeh	4.8 (3.0)	103 (255)
Subunit 6C–Bosque del Apache NWR				
Canal	Partial	Service	21.1 (13.1)	403 (995)
Total Unit 6			29.6 (18.5)	586 (1447)
Unit 7–Florida				
Florida River	Partial	Private Bureau of Land Mgt		254 (627) 3 (6)
Total Unit 7			13.6 (8.4)	256 (634)
Unit 8–Sambrito Creek				
Sambrito Creek	Partial	State of Colorado Private		61 (150) 14 (35)
Total Unit 8			4.6 (2.9)	75 (184)
GRAND TOTAL ALL UNITS			**310.5 (193.1)**	**5843 (14,432)**

Table 2. New Mexico meadow jumping mouse critical habitat by land ownership.

STATE	Land Ownership, ha (ac)				
	Federal	**State**	**Private**	**Tribal**	**TOTAL**
New Mexico	1,536(3,793)	331(818)	900(2,223)	183(452)	**2,950(7,286)**
Arizona	1,891(4,671)	49(120)	508(1,255)		**2,448(6,046)**
Colorado	2(6)	175(432)	268(662)		**445(1,100)**
TOTAL	**3,429(8,470)**	**555(1,370)**	**1,676(4,140)**	**183(452)**	**5,843(14,432)**

ALTERNATIVE C: DESIGNATION OF CRITICAL HABITAT WITH EXCLUSIONS

Alternative C would designate 5660 ha (13,980ac) of critical habitat for the New Mexico meadow jumping mouse. Alternative C would include all critical habitat units and subunits described under Alternative B except for Isleta Pueblo (80 ha (197 ac), and Ohkay Owingeh Tribal lands (103 ha (255 ac)). These lands considered for exclusion together total 183 ha (452 ac) or 3.13% of the proposed critical habitat designation described in Alternative B.

The USFWS is considering excluding these areas because the benefits of Tribal management and the capability of the tribes to appropriately manage their own resources may outweigh the benefits of designation of critical habitat. The USFWS will examine New Mexico meadow jumping mouse conservation actions, management plans, and commitments and assurances that occur on these lands for potential exclusion from the final designation.

Under section 4(b)(2) of the ESA, the Secretary may exclude areas from critical habitat designation if the benefit of excluding the area outweighs the benefit of its inclusion in the designation, and only if the exclusion will not result in the extinction of the species. In accordance with Secretarial Order 3206 USFWS acknowledges responsibilities to work directly with tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are

not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to tribes.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes aspects of the environment that may potentially be impacted by designating critical habitat for the New Mexico meadow jumping mouse. Potential effects of critical habitat designation under each alternative are then described for the various resource categories. Resource categories addressed in the analysis were selected based on issues identified during the public comment period on the proposed rule and conservation considerations for the New Mexico meadow jumping mouse.

METHODOLOGY

Descriptions of the affected environment presented in this section are based on a number of sources. These include:

- Published literature
- Available state and federal agency reports and management plans
- The proposed rule for designation of critical habitat
- The Draft Species Status Assessment Report
- The draft economic analysis

The evaluation of impacts in this chapter focuses on costs and outcomes of additional Section 7 consultations resulting from the designation of critical habitat for the New Mexico meadow jumping mouse over and above those needed as a result of the species being listed under ESA. The additional analysis can result in time delays for evaluating impacts to critical habitat as well as to the species.

The analysis area for this EA includes 12 counties in three states including: Bernalillo, Colfax, Mora, Otero, Rio Arriba, Sandoval, and Socorro Counties in New Mexico; Las Animas, Archuleta, and La Plata Counties in Colorado; and Greenlee and Apache Counties in Arizona. It also includes two sovereign nations: the Ohkay Owingeh and Isleta Pueblo.

NATURE OF IMPACTS FROM CRITICAL HABITAT DESIGNATION

Impacts on the environment from designation of critical habitat stem from section 7 consultation requirements of the ESA. Under section 7(a)(2) of the ESA, federal agencies are required to consult with the Service on actions that they fund, implement, or authorize, which may affect listed species or critical habitat (50 CFR §402). The purpose of section 7 consultation, with respect to critical habitat, is to ensure that the actions of federal agencies do not destroy or adversely modify critical habitat. Critical habitat is defined as habitat that is essential for the conservation of a listed species. Critical habitat designation does not have any impact on the environment other than through the section 7 consultation process. Critical habitat designation alone does not establish blanket rules or restrictions on land use, nor does it automatically prohibit or modify any activity.

Each proposed federal action that may potentially affect designated critical habitat is analyzed individually during the section 7 consultation process. Individuals, organizations, states, local governments, Tribes, Pueblos, and other non-federal entities are potentially affected by the designation of critical habitat only if their actions occur on federal lands, require a federal permit, license, or other authorization, or involve federal funding. The potential for destruction or adverse modification of critical habitat is assessed by determining the effects of the proposed action on primary constituent elements that are essential to the conservation of the species. These anticipated affects are then analyzed to determine how they will influence the function and conservation role of the affected critical habitat unit. This analysis provides the basis for determining the significance of anticipated effects of the proposed action on critical habitat. The threshold for destruction or adverse modification is evaluated in the context of whether or not the critical habitat would remain functional (or retain the current potential for primary constituent elements to be functionally established) to serve the intended conservation role for the species.

The USFWS found that it is essential for the conservation of the New Mexico meadow jumping mouse to expand its occupied habitats into areas considered currently unoccupied, but within its historical range. The inclusion of essential but unoccupied areas will not only protect these segments and provide habitat for population expansion from the 29 locations documented since 2005, but also provide sites for possible future reintroduction that will improve the species' status through added population resiliency (78 FR 37328). For each of the 19 areas (encompassing 29 locations) considered occupied, critical habitat units were proposed that include areas that are considered unoccupied adjacent to the occupied areas. The currently occupied areas contain the essential PCEs (1 and 2), indicating each area requires special management considerations or protections to maintain those PCEs; however, the unoccupied areas are essential for the restoration of the essential PCEs (1, 2, 3, and 4) along streams and other waterways. Each of these units or subunits are considered “partially occupied” because they include some small areas

that have been occupied by the species since 2005 and other larger areas upstream or downstream that are not known to be occupied by the New Mexico meadow jumping mouse at the time of listing.

The USFWS also found four subunits (described under the Jemez Mountains, Sacramento Mountains, and middle Rio Grande Units) that are completely unoccupied, but are essential for the conservation of the New Mexico meadow jumping mouse. All of these completely unoccupied areas currently have flowing water to allow for future restoration of the essential PCEs 1 and 2, but also PCE 3—sufficient areas of streams, ditches or canals; and PCE 4—adjacent floodplain and upland areas that would collectively provide the needed physical and biological features of habitat essential for the conservation of the species. Inclusion of these areas provides for expansion of the overall geographic distribution of the species and increases the redundancy within these conservation areas. For each of these unoccupied subunits, the USFWS found that, because of ongoing habitat loss, the conservation of the New Mexico meadow jumping mouse requires the protection of stream reaches with a high potential for restoration of suitable habitat to enable the reestablishment of the New Mexico meadow jumping mouse within areas that were historically occupied. The protection and restoration of suitable habitat within these areas will enable the reestablishment of the New Mexico meadow jumping mouse and increase its distribution to provide population redundancy and resiliency.

Regeneration of suitable habitat within areas proposed as critical habitat will involve modifying or limiting actions that preclude the development of PCEs (i.e., modifying proposed actions in order to allow appropriate vegetation to regrow) that make up suitable habitat. Critical habitat designation will not require that any parties proactively undertake habitat restoration activities within the designated areas. However, during section 7 consultation for these unoccupied areas, it is expected that some conservation measures will need to be implemented to avoid destruction or adverse modification.

The key factor related to an adverse modification determination would be whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended function and conservation role for the species. An adverse modification analysis focuses on a project's impacts to the physical or biological features (primary constituent elements, or PCEs), or other habitat characteristics in areas determined by the Secretary to be essential for the conservation of the species, and analyzes impacts to the capability of the critical habitat unit to maintain its conservation role and function for the species. From section 3(3) of the Act: "The terms "conserve," "conserving," and "conservation" mean to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided under the Endangered Species Act are no longer necessary." Thus, designation of critical habitat helps ensure that proposed project actions

will not result in the adverse modification of habitat to the point that the species will not achieve recovery.

The preferred alternative proposes to designate critical habitat in many areas that are considered unoccupied, indicating a requirement for section 7 consultation that may not have otherwise occurred because the species is absent. The most likely source of incremental effects of the proposed critical habitat comes from the inclusion of these unoccupied areas (where the species historically occurred and are currently not known to occur). Incremental effects are those imposed by the critical habitat designation over and above those impacts imposed as a result of listing the species. The vast majority of each of the proposed critical habitat units are considered unoccupied and currently contain small areas of suitable habitat. The USFWS considers the 29 locations where the jumping mouse has been found since 2005 to be within the geographic area occupied at the time of listing (occupied areas). All of these occupied areas are contained within 19 of the 23 proposed critical habitat units. The exceptions are four completely unoccupied units (3-C Rio de las Vacas, 4-B Upper Rio Peñasco, 6-A Isleta Pueblo, and 6-B Ohkay Owingeh 3-C).

In occupied critical habitat, the same Federal agencies and project activities that would incur baseline costs for section 7 consultation to avoid jeopardy are expected to be the primary agencies and actions that would also consult with the Service under section 7 to avoid destruction of adverse modification of jumping mouse critical habitat. In the completely unoccupied critical habitat units proposed on Isleta Pueblo and Ohkay Owingeh (previously known as San Juan Pueblo), it is expected that consultation would occur with the Bureau of Indian Affairs (for actions such as riparian habitat restoration, fire management plans, fire suppression, and fuel reduction treatments). In unoccupied critical habitat, Federal agencies would be required to ensure their actions do not destroy or adversely modify that critical habitat.

For areas known to be occupied by the mouse, proposed Federal actions that would result in sufficient impact to the species to constitute jeopardy would in most cases also likely affect PCEs in the occupied designated critical habitat to a sufficient degree to constitute adverse modification. This is because the jumping mouse is such an extreme habitat specialist, only occurring in areas that provide the precise vegetation conditions to allow them to complete their life history.

As such, project modifications that minimize effects to the jumping mouse under the jeopardy standard would in most cases concurrently minimize effects to designated critical habitat. Accordingly, in occupied critical habitat areas it is unlikely that a jeopardy analysis would identify a difference between measures needed to avoid the destruction or adverse modification of critical habitat from measures needed to avoid jeopardizing the species. Therefore, measurable incremental differences between a jeopardy analysis and an adverse modification analysis in

regard to developing and implementing conservation measures in currently occupied critical habitat for the jumping mouse are not anticipated.

However, within unoccupied areas of designated critical habitat, it is expected that for a proposed action to result in adverse modification (in other words, to appreciably diminish the function and conservation role of the critical habitat designation to satisfy essential life-history requirements of the species), it would have to destroy, alter, or preclude the development or reestablishment of the physical and biological features and primary constituent elements to an extent that the value of critical habitat for conservation of the species would be appreciably reduced. As identified in the proposed critical habitat rule for the jumping mouse, unoccupied habitat is essential because: (1) unoccupied areas expand the available habitat within a given unit that can be occupied by the species and provide for an increased population size within that riparian system; (2) additional areas are required to provide population redundancy and reduce susceptibility of the species to extinction; and (3) existing habitat is insufficient to recover the species. Therefore, proposed actions that significantly decrease expansion areas, reduce the ability of the species to expand within its historical range, or preclude the ability of the jumping mouse to connect to other occupied areas could result in a determination of adverse modification. Consequently, incremental effects imposed by the critical habitat designation would be anticipated in regard to developing and implementing conservation measures because no section 7 consultation would have likely occurred as a result of listing the species without the critical habitat designation.

Any project that may occur in unoccupied areas of critical habitat would need to pay particular attention to ongoing actions such as livestock grazing, recreation, or water management. Depending on the project location and the jumping mouse population(s) affected, some types of projects may result in adverse modification of critical habitat, but may not jeopardize the species. In the proposed designation, each of the eight units (conservation areas) is essential for critical habitat to serve its intended purpose; loss of functionality of even one unit would severely impair the conservation functionality of the entire designation and may result in a finding of destruction or adverse modification. Further, the substantial reduction or elimination of the conservation value of an unoccupied segment of a stream within a critical habitat unit may cause that unit to fail to reach future recovery goals once they are established in a recovery plan. Thus, any substantial reduction in the conservation value of a proposed critical habitat unit with no jumping mice could potentially result in an adverse modification finding without reaching jeopardy. For example, there are 29 populations containing patches of currently suitable occupied habitat; however, jumping mice are unlikely to be found beyond the maximum dispersal distance of 0.8 km (0.5 mi) of these areas presently considered occupied (based on observations since 2005). Consequently, the majority of acres within these partially occupied critical habitat units located along streams, ditches, and canals are considered unoccupied (i.e., outside of the occupied

habitat areas and their corresponding 0.8 km (0.5 mi) distance. These unoccupied segments do not contain jumping mice, nor large (greater than several acres) patches of suitable habitat. Projects in these unoccupied areas may alter or remove PCEs within small patches of suitable habitat, and may preclude the development or reestablishment of PCEs in these areas. For example, protection of unoccupied areas to facilitate the development or reestablishment of PCEs may be required for future or ongoing Federal actions (such as livestock grazing or recreation). Therefore, it is possible that activities may affect the character of the physical habitat to such an extent that critical habitat may be adversely modified and not result in direct or indirect affects to jumping mouse populations such that it would jeopardize the species. This is because projects may occur wholly outside of the areas considered currently occupied habitat. These additional section 7 consultations would cause an increase in administrative effort to develop measures to avoid the adverse modification. Therefore, incremental costs would be both administrative costs and the actual costs for implementing measures needed to avoid adverse modification in unoccupied critical habitat areas.

It is anticipated there would be differences in how the USFWS conducts jeopardy and adverse modification analyses, depending on whether areas are considered occupied or not. The presence of the jumping mouse is often difficult to detect, and very little information is available regarding the size of populations. Consequently, within occupied areas, the jeopardy analysis under section 7 consultation for the jumping mouse will likely use habitat attributes as a surrogate for assessing and monitoring the amount of take. However, within unoccupied areas of critical habitat, many of the habitat attributes are currently missing and are in need of reestablishment. In areas that are unoccupied, there would be no proxy for take under the jeopardy analysis, because there would be no individual mice present and subject to harm or harassment. Within these unoccupied areas, the adverse modification analysis would focus on the effects of a proposed project's impacts to precluding the development of the physical features that collectively define the PCEs. It is anticipated that only within occupied areas would both the jeopardy analysis and an adverse modification analysis focus on the effects of a proposed project's impacts to the physical features that collectively define the PCEs for this species.

Therefore, incremental effects are anticipated with regard to ongoing and proposed Federal actions, including developing and implementing conservation measures that may differ between currently occupied and unoccupied critical habitat and habitat for the jumping mouse.

Other impacts of additional or more complicated analysis may include the following:

1. Additional expenditures of effort and money by federal agencies, including the USFWS, to complete the consultations.

2. Additional effort and costs to implement the reasonable and prudent alternatives specified in biological opinions in which adverse modification was concluded and (possibly) discretionary conservation recommendations.

ECONOMIC ANALYSIS

For this proposed designation, USFWS developed an Incremental Effects Memorandum (IEM) considering the probable incremental economic impacts that may result from this proposed designation of critical habitat (USFWS 2013c). The information contained in the IEM was then used to develop a screening analysis of the probable effects of the designation of critical habitat for the New Mexico meadow jumping mouse (IEc 2014a). The purpose of the screening analysis is to filter out the geographic areas in which the critical habitat designation is unlikely to result in probable incremental economic impacts. In particular, the screening analysis considers baseline costs (i.e., absent critical habitat designation) and includes probable economic impacts where land and water use may be subject to conservation plans, land management plans, best management practices, or regulations that protect the habitat area as a result of the Federal listing status of the species. The screening analysis filters out particular areas of critical habitat that are already subject to such protections and assesses whether units are unoccupied by the species and may require additional management or conservation efforts as a result of the critical habitat designation for the species.

FISH, WILDLIFE, AND VEGETATION

EXISTING CONDITIONS

SPECIES PROTECTED UNDER THE ENDANGERED SPECIES ACT

The counties containing proposed critical habitat support 49 species that are protected under the ESA (table 4). Five of these species (Southwestern willow flycatcher, Chiricahua leopard frog, loach minnow, spikedace, and Pecos sunflower) could occur in the proposed critical habitat units because the units are within the range of the species and contain suitable habitat. In addition, critical habitat for five listed species (Mexican spotted owl, Southwestern willow flycatcher, loach minnow, spikedace, and Rio Grande silvery minnow) occurs within the area proposed for critical habitat for the New Mexico meadow jumping mouse.

The southwestern willow flycatcher breeds in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including lakes (e.g.,

reservoirs) (USFWS 2002). Common tree and shrub species comprising nesting habitat include willows (*Salix* spp.), seepwillow (aka mulefat; *Baccharis* spp.),boxelder (*Acer negundo*), stinging nettle (*Urtica* spp.), blackberry (*Rubus* spp.), cottonwood (*Populus* spp.), arrowweed (*Tessaria sericea*), tamarisk (aka saltcedar; *Tamarix ramosissima*), and Russian olive (*Eleagnus angustifolia*). Regardless of the plant species composition or height, occupied sites usually consist of dense vegetation in the patch interior, or an aggregate of dense patches interspersed with openings. In most cases this dense vegetation occurs within the first 3 - 4 m (10-13 ft) above ground (USFWS 2002). These dense patches are often interspersed with small openings, open water, or shorter/sparser vegetation, creating a mosaic that is not uniformly dense. In almost all cases, slow-moving or still surface water and/or saturated soil is present at or near breeding sites during wet or non-drought years (USFWS 2002).There is overlap between the habitat requirements of the southwestern willow flycatcher and the New Mexico meadow jumping mouse, although the flycatcher generally is more associated with the taller, woodier vegetation and is often found at lower elevations. Southwestern willow flycatcher critical habitat occurs on proposed New Mexico meadow jumping mouse critical habitat units 2 and 6.

Chiricahua leopard frogs are capable of occupying a broad range of environmental types in the absence of aquatic predatory species. Natural systems include rivers, permanent streams, permanent pools in intermittent streams, beaver ponds, cienegas (i.e., wetlands), and springs. Artificial systems in which they have been recorded include earthen cattle tanks, livestock drinkers, irrigation sloughs or acequias, wells, abandoned swimming pools, ornamental back yard ponds, and mine adits at elevations of 3,281 to 8,890 feet (USFWS 2007). Although critical habitat has been designated for the species, no critical habitat for this species occurs within the proposed units for the New Mexico meadow jumping mouse.

Pecos sunflower is found near Bosque del Apache NWR, but does not occur on the refuge. The species is restricted to desert wetland habitats. Those desert wetland habitats where it is found generally are spring-fed marshes or wet meadows, referred to as *cienegas*, with saline soils (Service 2005). Habitats with suitable soils and hydrologic condition are typically small areas around springs and ponds. These habitat requirements are different from those of the New Mexico meadow jumping mouse and the sunflower is not likely to be found in the proposed critical habitat units. Critical habitat has been designated for the Pecos sunflower, and does not include any of the proposed units for the New Mexico meadow jumping mouse.

Critical habitat for the Mexican spotted owl overlaps with proposed critical habitat for New Mexico meadow jumping mouse on Units 3, 4, and 5. Mexican spotted owl requires conifer forests with multiple canopy layers. Nesting and roosting habitat typically occurs either in well-structured forests with high canopy cover, large trees, and other late seral characteristics, or in steep and narrow rocky canyons formed by parallel cliffs with numerous caves and/or ledges within specific geologic formations (USFWS 2012b).

Critical habitat for loach minnow overlaps with proposed critical habitat for New Mexico meadow jumping mouse on Unit 5. Loach minnow is a bottom dweller of small to large perennial creeks and rivers, typically in shallow turbulent riffles with cobble substrate, swift currents, and filamentous algae (USFWS 2012c). It is found below 8,000 feet (2,438 m) elevation. Recurrent flooding is instrumental in maintenance of quality habitat (USFWS 2012c).

Critical habitat for spikedace overlaps with proposed critical habitat for New Mexico meadow jumping mouse on Unit 5. Spikedace are found in moderate to large perennial streams, where it inhabits moderate to fast velocity waters over gravel and rubble substrates (USFWS 2012d). Specific habitat consists of shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand/gravel bars, and eddies at downstream riffle edges (USFWS 2012d) . Recurrent flooding helps the spikedace maintain its competitive edge over invading exotic species. Typically occupied streams are found under 6,000 feet in elevation (USFWS 2012d) .

Rio Grande silvery minnow critical habitat overlaps on unit 6 at Bosque del Apache NWR. This riverine minnow occurs in waters with slow to moderate flow in perennial sections of the Rio Grande and associated irrigation canals. Most often it uses silt substrates (much less often sand) and typically occurs in pools, backwaters, or eddies formed by debris piles; larger individuals use a broad spectrum of habitats, including main and side channel runs, but this species rarely uses areas with high water velocities (USFWS 2007).

Several species have designated nonessential experimental populations in the vicinity of the proposed critical habitat units. For the purposes of section 7 of the Act, USFWS treats a nonessential experimental population as a threatened species when the NEP is located within a National Wildlife Refuge or unit of the National Park Service, and as proposed for listing when they occur outside a National Wildlife Refuge or unit of the National Park Service. The nonessential experimental populations include Mexican Gray wolf *(Canis lupus baileyi),* North American wolverine (*Gulo gulo luscus*), Northern Aplomado falcon (*Falco femoralis septentrionalis),* and whooping crane (*Grus americana).* The wide-ranging Mexican gray wolf and Aplomado falcon could potentially range onto the proposed critical habitat for the New Mexico meadow jumping mouse, but are not likely to be affected by the designation. North American wolverine and black-footed ferret occur in different vegetation types. Whooping crane is likely extirpated on Bosque del Apache NWR, the only location where it may occur in the proposed critical habitat.

Table 3. ESA listed, proposed, or candidate species potentially co-occuring in counties where critical habitat is proposed for the New Mexico meadow jumping mouse.

STATE	COUNTIES	COMMON NAME	SCIENTIFIC NAME	TAXONOMIC GROUP	STATUS
Arizona	Apache	Navajo sedge	*Carex specuicola*	Plant	Threatened
Arizona	Apache	Zuni fleabane	*Erigeron rhizomatus*	Plant	Threatened
Arizona	Apache	Three Forks springsnail	*Pyrgulopsis trivialis*	Mollusc - Invertebrate	Endangered
Arizona	Apache, Greenlee	Apache (Arizona) trout	*Oncorhynchus gilae apache*	Fish	Threatened
Arizona	Greenlee	Gila chub	*Gila intermedi*	Fish	Endangered
Arizona	Greenlee	Gila trout	*Oncorhynchus gilae gilae*	Fish	Threatened
Arizona	Apache	Little Colorado spinedace	*Lepidomeda vittata*	Fish	Threatened
Arizona	Apache, Greenlee	Loach minnow	*Tiaroga cobitis*	Fish	Endangered
Arizona	Greenlee	Razorback sucker	*Xyrauchen texanus*	Fish	Endangered
Arizona	Apache, Greenlee	Roundtail chub	*Gila robusta*	Fish	Candidate
Arizona	Greenlee	Spikedace	*Meda fulgida*	Fish	Endangered
Arizona	Apache	New Mexico meadow jumping mouse	*Catostomus discorbolus yarrowi*	Fish	Proposed Endangered
Arizona	Apache, Greenlee	Chiricahua leopard frog	*Lithobates chiricahuensis*	Amphibian	Threatened
Arizona	Apache, Greenlee	Northern Mexican gartersnake	*Thamnophis eques megalops*	Reptile	Proposed Endangered
Arizona	Apache, Greenlee	Narrow-headed gartersnake	*Thamnophis rufipunctatus*	Reptile	Proposed Endangered
Arizona	Apache	California condor	*Gymnogyps californianus*	Bird	Endangered
Arizona	Apache, Greenlee	Mexican spotted owl	*Strix occidentalis lucida*	Bird	Threatened

STATE	COUNTIES	COMMON NAME	SCIENTIFIC NAME	TAXONOMIC GROUP	STATUS
Arizona	Apache, Greenlee	Southwestern willow flycatcher	*Empidonax traillii extimus*	Bird	Endangered
Arizona	Apache, Greenlee	Yellow-billed cuckoo	*Coccyzus americanus*	Bird	Proposed Threatened
Arizona	Apache	Black-footed ferret	*Mustela nigripes*	Mammal	Endangered
Arizona	Greenlee	Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Mammal	Endangered
Arizona	Apache, Greenlee	Mexican gray wolf	*Canis lupus baileyi*	Mammal	Experimental Population, Non-Essential
Arizona	Apache, Greenlee	New Mexico meadow jumping mouse	*Zapus hudsonius luteus*	Mammal	Proposed Endangered
Colorado	La Plata	Knowlton's cactus	*Pediocactus knowltonii*	Plant	Endangered
Colorado	Archuleta	Pagosa skyrocket	*Ipomopsis polyantha*	Plant	Endangered
Colorado	Las Animas	Arkansas darter	*Etheostoma cragini*	Fish	Candidate
Colorado	Archuleta, La Plata, Las Animas	Mexican spotted owl	*Strix occidentalis lucida*	Bird	Threatened
Colorado	Archuleta, La Plata	Southwestern willow flycatcher	*Empidonax traillii extimus*	Bird	Endangered
Colorado	Archuleta, La Plata	Yellow-billed cuckoo	*Coccyzus americanus*	Bird	Proposed Threatened
Colorado	Archuleta, La Plata, Las Animas	Black-footed ferret	*Mustela nigripes*	Mammal	Endangered
Colorado	Archuleta, La Plata, Las Animas	Canada lynx	*Lynx canadensis*	Mammal	Threatened
Colorado	Archuleta, La Plata, Las Animas	New Mexico meadow jumping mouse	*Zapus hudsonius luteus*	Mammal	Proposed Endangered

STATE	COUNTIES	COMMON NAME	SCIENTIFIC NAME	TAXONOMIC GROUP	STATUS
Colorado	Archuleta, La Plata, Las Animas	North American wolverine	*Gulo gulo luscus*	Mammal	Proposed Experimental Population, Non-Essential
Colorado	La Plata	Uncompahgre fritillary butterfly	*Boloria acrocnema*	Insect	Endangered
New Mexico	Otero	Kuenzler's hedgehog cactus	*Echinocereus fendleri* var. *kuenzleri Escobaria (=Coryphantha)*	Plant	Endangered
New Mexico	Socorro	Pecos sunflower	*Helianthus paradoxus*	Plant	Threatened
New Mexico	Otero	Sacramento Mountains thistle	*Cirsium vinaceum*	Plant	Threatened
New Mexico	Otero	Sacramento prickly poppy	*Argemone pleiacantha* spp. *pinnatisecta*	Plant	Endangered
New Mexico	Otero	Todsen's pennyroyal	*Hedeoma todsenii*	Plant	Endangered
New Mexico	Otero, Socorro	Wright's marsh thistle	*Cirsium wrightii*	Plant	Candidate
New Mexico	Socorro	Alamosa springsnail	*Psuedotryonia alamosae*	Mollusc - Invertebrate	Endangered
New Mexico	Socorro	Chupadera springsnail	*Pyrgulopsis chupaderae*	Mollusc - Invertebrate	Endangered
New Mexico	Socorro	Socorro springsnail	*Pyrgulopsis neomexicana*	Mollusc - Invertebrate	Endangered
New Mexico	Socorro	Socorro isopod	*Thermosphaeroma thermophilum*	Arthropod - Invertebrate	Endangered
New	Colfax, Mora	Arkansas River shiner	*Notropis girardi*	Fish	Threatened

STATE	COUNTIES	COMMON NAME	SCIENTIFIC NAME	TAXONOMIC GROUP	STATUS
Mexico					
New Mexico	Colfax, Mora, Otero, Rio Arriba, Sandoval	Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Fish	Candidate
New Mexico	Bernalillo, Rio Arriba, Sandoval, Socorro	Rio Grande silvery minnow	*Hybognathus amarus*	Fish	Endangered
New Mexico	Rio Arriba	Roundtail chub	*Gila robusta*	Fish	Candidate
New Mexico	Socorro	Chiricahua leopard frog	*Rana chiricahuensis*	Amphibian	Threatened
New Mexico	Rio Arriba, Sandoval	Jemez Mountains salamander	*Plethodon neomexicanus*	Amphibian	Endangered
New Mexico	Otero, Rio Arriba, Socorro	Least tern (interior population)	*Sterna antillarum*	Bird	Endangered
New Mexico	Bernalillo, Mora, Otero, Rio Arriba, Sandoval, Socorro	Mexican spotted owl	*Strix occidentalis lucida*	Bird	Threatened
New Mexico	Otero, Socorro	Northern aplomado falcon	*Falco femoralis septentrionalis*	Bird	Experimental, Non-essential Population
New Mexico	Colfax, Socorro	Piping plover	*Charadrius melodus*	Bird	Threatened
New Mexico	Bernalillo, Colfax, Mora, Otero, Rio Arriba, Sandoval, Socorro, Valencia	Southwestern willow flycatcher	*Empidonax traillii extimus*	Bird	Endangered

STATE	COUNTIES	COMMON NAME	SCIENTIFIC NAME	TAXONOMIC GROUP	STATUS
New Mexico	Bernalillo, Colfax, Mora, Otero, Rio Arriba, Sandoval, Socorro	Whooping crane	*Grus americana*	Bird	Experimental, Non-essential Population
New Mexico	Bernalillo, Mora, Rio Arriba, Sandoval, Socorro,	Yellow-billed cuckoo	*Coccyzus americanus*	Bird	Proposed Threatened
New Mexico	Colfax, Bernalillo, Mora, Otero, Rio Arriba, Sandoval, Socorro	Black-footed ferret	*Mustela nigripes*	Mammal	Endangered
New Mexico	Colfax, Mora, Rio Arriba	Canada lynx	*Lynx canadensis*	Mammal	Proposed Threatened
New Mexico	Colfax, Bernalillo, Mora, Otero, Rio Arriba, Sandoval, Socorro	New Mexico meadow jumping mouse	*Zapus hudsonius luteus*	Mammal	Proposed Endangered
New Mexico	Otero	Peñasco (Least) chipmunk	*Tamias minimus atristriatus*	Mammal	Candidate

OTHER SENSITIVE SPECIES

The Gooding's onion is protected by a Conservation Agreement. Gooding's Onion Management Unit ASNF 04 - Black River South Watershed is in the watershed of the Black River downstream from the confluence of the East and West Forks, near the proposed West Fork Black River and East Fork Black River critical habitat units for the New Mexico meadow jumping mouse. Gooding's onion is typically associated with drainage bottoms, although some sites extend up slopes along drainages. Critical habitat designation for New Mexico meadow jumping mouse would likely benefit the Gooding's onion and would not affect the Conservation Agreement.

All of the proposed critical habitat units in New Mexico and Arizona are within Forest Service Region 3. The Region 3 Regional Forester's Sensitive species lists contains 218 species, many of which are associated with riparian areas and are likely to be found in the proposed critical habitat (Forest Service 1999). The proposed critical habitat units within Colorado are within Forest Service Region 2. However, none of the units are on Forest Service lands in this Region. BLM lands comprise only 6 acres (less than 1%) of the proposed Florida River, Colorado, critical habitat unit. The Colorado BLM Sensitive species list contains 42 species in the San Juan District, some of these species could be found in the proposed critical habitat units because they are riparian dependent (Bureau of Land Management 2009).

Many of the AGFD Species of Greatest Conservation Need in the Arizona-New Mexico Mountain Ecoregion that occur in wetlands/springs or streams/rivers also are likely to occur within the proposed critical habitat units (AGFD 2012). Many of the New Mexico Department of Game and Fish Species of Greatest Conservation Need also are riparian and wetland specialists (New Mexico Department of Game and Fish 2006). Some of these species are likely to occur within the proposed critical habitat units. Similarly many of the Colorado Division of Wildlife Species of Greatest Conservation Need also are riparian and wetland specialists (Colorado Division of Wildlife 2006). Some of these species are likely to occur within the proposed critical habitat units.

BIRDS OF CONSERVATION CONCERN

All agencies are required to consider in planning documents, including NEPA documents, all Birds of Conservation Concern by Executive Order 13186. Proposed Critical Habitat units for the New Mexico meadow jumping mouse are in Bird Conservation Region (BCR) Number 16 (Southern Rockies/Colorado Plateau) and BCR 35 (Chihuahuan Desert; Unit 4 and Unit 6C only)

(USFWS 2008). Birds of Conservation Concern occurring within the critical habitat units are typical of the BCRs.

MIGRATORY BIRDS

The Migratory Bird Treaty Act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition, this act serves to protect environmental conditions for migratory birds from pollution or other ecosystem degradations.

Nearly all bird species occurring on the proposed critical habitat are protected under the Migratory Bird Treaty Act (USFWS 2012a). Exceptions include nonnative species such as House sparrow (*Passer domesticus*) and European starling (*Sturnus vulgaris*).

BALD AND GOLDEN EAGLES

Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are protected under the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668c). The Bald and Golden Eagle Protection Act (Act) prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. The Act provides for civil and criminal penalties for persons who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle, ... alive or dead, or any part, nest, or egg thereof.” The Act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” “Disturb’’ is further defined by regulation as: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

(COMMON) WILDLIFE

Common wildlife species in the proposed critical habitat units are typical of those found throughout montane areas of Arizona, New Mexico, and Colorado and the Rio Grande Valley of New Mexico. Of particular importance among common wildlife species is the American beaver (*Castor canadensis*). Once abundant throughout the region, beaver have declined in numbers due to overharvesting and drainage of wetlands (Naiman *et al*. 1988, Baker and Hill 2003, Crawford

et al. 1993). Huey (1956) reported that beaver were nearly extinct in New Mexico by the 1890s. Beaver were subsequently stocked throughout New Mexico by the NMDGF in the 1940s and 1950s (Findley *et al.* 1975). Beavers are listed in NMDGF's Comprehensive Wildlife Conservation Strategy for New Mexico (2006) as a Species of Greatest Conservation Need because of their role in improving riparian habitats. There are currently no established beaver populations within parts of the Jemez Mountains (e.g., the Valles Caldera National Preserve; VCNP 2012) or the Sacramento Mountains; however, the VCNP, Santa Fe National Forest, and Lincoln National Forest have begun exploring methods to reestablish or augment beaver populations. Beavers occur in the White Mountains of Arizona and the Sangre de Cristo and San Juan Mountains of the southern Rocky Mountains of Colorado and New Mexico.

VEGETATION

As described in the description of PCEs above, critical habitat is composed of:

(a) Persistent emergent herbaceous wetlands dominated by beaked sedge (*Carex rostrata*) or reed canarygrass (*Phalaris arundinacea*) alliances; or

(b) Scrub-shrub riparian areas that are dominated by willows (*Salix* spp.) or alders (*Alnus* spp.)

Critical habitat also would include adjacent floodplain and upland areas extending approximately 100 m (330 ft) outward from the water's edge (as defined by the bankfull stage of streams). This area may include a wide variety of vegetation types ranging from forests to agricultural crops.

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A (NO ACTION)

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultations under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated. Agencies likely to consult if no critical habitat is designated include (USFWS 2013c):

1. U.S. Army Corps of Engineers (bridge and road realignment projects, post-fire stabilization, stream restoration, and vegetation management).
2. U.S. Bureau of Reclamation (transportation, storage, diversion, and delivery of water).

3. Federal Highways Administration (highway and bridge construction and maintenance).

4. U.S. Forest Service (riparian habitat restoration, fire management plans, fire suppression, fuel reduction treatments, forest plans, livestock grazing allotment management plans, recreational use, and travel management plans).

5. U.S. Fish and Wildlife Service (issuance of section 10 permits for enhancement of survival, habitat conservation plans, and safe harbor agreements, Partners for Fish and Wildlife program projects, Wildlife and Sport Fish Restoration Funding appropriations, National Wildlife Refuge planning and projects).

6. U.S. Department of Animal and Plant Health Inspection Service (management and removal of beaver).

If USFWS determines a project is likely to cause jeopardy they will recommend project modifications. Project modifications to avoid jeopardy would benefit the New Mexico meadow jumping mouse. However, these benefits would be limited to populations in occupied areas, and would be unlikely to facilitate recovery of the species because current populations lack the resiliency, redundancy, and representation necessary for long-term viability (USFWS 2013b). Project modifications for occupied habitat could include the following (USFWS 2013c):

1. Implement seasonal restriction for projects occurring within a known occupied area to maintain required habitat components (dense herbaceous riparian vegetation averaging at least 61 cm (24 in) tall).
2. Relocate the project to an area outside of occupied or restorable New Mexico meadow jumping mouse habitat.
3. Reduce the size and configuration of the proposed project to avoid, reduce, or eliminate the effects to the species.
4. Avoid ground disturbing activities or reduce project elements that would eliminate or significantly reduce the size and configuration of occupied habitat patches containing dense herbaceous riparian vegetation.
5. Implement in-situ conservation (on-site conservation of this species) by reestablishing dense herbaceous riparian vegetation to expand the remaining populations and improve the degraded status of the New Mexico meadow jumping mouse within a project's action area.
6. Regularly inspect and enforce protection of occupied suitable habitat patches to ensure unauthorized activities (e.g., livestock entering exclosures; and off-road vehicle recreation) related to the proposed project do not result in loss, modification, or fragmentation of dense herbaceous riparian vegetation.

7. Offset permanent occupied habitat loss with suitable habitat that is permanently protected elsewhere within the species' range, including adequate funding to ensure that habitat is managed permanently for the protection of the species. Note: habitat loss, modification, or fragmentation on Federal lands should not be offset with protection of other Federal lands that would otherwise qualify for protection if the standards set forth in other agency guidance were applied to those lands.

Other federally listed and proposed species, state-listed species, and Forest Service and BLM sensitive species are likely to benefit from the improvements in riparian vegetation resulting from these project modifications for the New Mexico meadow jumping mouse. Many migratory birds and Birds of Conservation Concern are riparian dependent and are likely to benefit from protection and management of flowing streams, persistent emergent herbaceous wetlands, and scrub-shrub riparian vegetation. Most native fish and amphibians also would benefit from maintenance of flowing streams and herbaceous riparian vegetation, as would a number of common native invertebrates, reptiles, and mammals. Riparian scrub-shrub and persistent emergent herbaceous wetlands are likely to benefit as well.

One mammal likely to particularly benefit is the American beaver. The management and restoration of beaver is an important component of New Mexico meadow jumping mouse conservation (USFWS 2013b) and beaver populations are likely to benefit from habitat improvements.

However, without the benefit of critical habitat designation, conservation actions such as beaver translocations, fencing, and restoration of riparian vegetation would likely be limited to the small areas occupied by the New Mexico meadow jumping mouse. As a result, benefits to fish, wildlife and vegetation would occur on such a limited area that populations would not likely increase to any significant extent.

ALTERNATIVE B (DESIGNATION OF CRITICAL HABITAT)

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultations under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. In addition to the agencies described in the no action alternative, the BIA may consult with USFWS on projects related to riparian habitat restoration, fire management plans, fire suppression, and fuel reduction treatments if critical habitat is designated because all proposed critical habitat on lands administered by the

BIA is unoccupied and projects in these unoccupied areas would not likely require consultation as a result of listing the species The number of consultations with other federal agencies would be greater than in Alternative A because the majority of proposed critical habitat area is unoccupied and consultations for projects implemented on these unoccupied areas likely would not have occurred as a result of listing the species. However, all but four of the units are partially occupied by the New Mexico meadow jumping mouse. Additional consultations due solely to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied section of the partially-occupied critical habitat unit a. Most actions to maintain or restore fish, wildlife, or vegetation, such as restoration of hydrologic function, native species composition, or habitat structure, would occur over large areas and are not likely to occur wholly outside of the occupied portions of each unit. Because they would also occur on the occupied portions of each critical habitat unit, these restoration actions would trigger section 7 consultations under the jeopardy standard. Therefore an increase in the number of consultations is likely to be limited to the four wholly unoccupied areas.

Conservation efforts for the New Mexico meadow jumping mouse would likely improve habitat conditions over a much larger area than in Alternative A because these efforts would occur in unoccupied sections of critical habitat as well as in the occupied areas. In addition to project modifications to avoid jeopardy in occupied critical habitat, project modifications may be proposed that will allow the development of PCEs in unoccupied critical habitat. These project modifications may be designed to allow for the regrowth of riparian vegetation that is currently lacking in most unoccupied areas of proposed critical habitat. Project modifications are not likely to be necessary for most fish, wildlife, and vegetation restoration projects because projects intended to benefit fish, wildlife, and vegetation would also be likely to benefit the riparian vegetation that is described PCE 1 or the riparian flows described in PCE 2. However, project modifications to avoid adverse modification of New Mexico meadow jumping mouse critical habitat from other types of projects (e.g. residential or commercial development, highway construction, livestock grazing, water management and use) would likely improve habitat for most other riparian associated species of fish, wildlife and native vegetation. These project modifications in unoccupied critical habitat may include (USFWS 2013c):

1. Relocate the project to an area outside of jumping mouse critical habitat.

2. Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to unoccupied critical habitat.

3. Avoid ground disturbing activities or reduce project elements that would preclude the development of habitat patches containing dense herbaceous riparian vegetation.

4. Implement in-situ conservation (on-site conservation of this species) by restoration of dense herbaceous riparian vegetation to expand the remaining populations and improve the degraded status of the jumping mouse within a project's action area. Conservation measures would likely include protection of riparian areas through fencing, changing the timing or duration of the action (e.g., dormant season grazing), encouraging the reestablishment of beaver through habitat enhancement or active translocation, or ensuring that a constant supply of water is provided throughout the stream, ditch, or canal during the growing season.

5. Temporarily mow or thin along streams, ditches, or canals to "set back" or remove woody vegetation and shrubs and allow dense herbaceous vegetation to regrow.

6. Reduce or retire water consumptive stressors (such as water diversion) to offset impacts or provide a constant supply of water for vegetation regeneration.

7. Modify livestock grazing activities through fencing, reconfiguration of grazing units, off-site water development, and seasons of use.

8. Modify off-road vehicle management through fencing, signage, education, and timing of use.

Many special status species (federally listed, proposed, candidate, state listed, and Forest Service and BLM sensitive species), migratory birds and Birds of Conservation Concern are dependent upon or associated with riparian areas. These species are likely to benefit from improved riparian conditions. Most common native fish and amphibians also would benefit from maintenance of flowing streams and herbaceous riparian vegetation, as would a number of common native invertebrates, reptiles, and mammals. More individuals and populations would benefit from conservation actions if critical habitat is designated, because a much larger area would be protected and managed to provide habitat for the New Mexico meadow jumping mouse. Additionally, the incorporation of a 100 m wide strip adjacent to streambank would provide additional habitat for native species in adjacent uplands included in the critical habitat to support breeding and hibernation which is one of the vital needs of the New Mexico meadow jumping mouse (USFWS 2013b).

Critical habitat for other listed species is likely to be positively affected by critical habitat designation for the New Mexico meadow jumping mouse. For example, measures taken to reduce the impacts of prescribed fire treatments on New Mexico meadow jumping mouse would likely benefit small areas of Mexican spotted owl critical habitat. Other management or protection action taken to protect New Mexico meadow jumping mouse critical habitat, such as watershed-level erosion control, would likely benefit the Mexican spotted owl, its prey, and its critical habitat by improving understory plant composition and structure. Allowing the

development of PCEs for New Mexico meadow jumping mouse would benefit critical habitat for the Southwestern willow flycatcher because PCE 1 for both New Mexico meadow jumping mouse and Southwestern willow flycatcher is riparian vegetation, which is the primary habitat used by the species (see PCEs, above; 78 FR 344). Similarly, allowing the development of PCEs for the New Mexico meadow jumping mouse would also benefit critical habitat for loach minnow, spikedace, and Rio Grande silvery minnow because maintaining riparian vegetation (PCE 1), and flowing water (PCE 2) for the New Mexico meadow jumping mouse would contribute to maintaining PCEs these species, particularly PCE 1 (flowing water) for Rio Grande silvery minnow, PCE 4 (perennial flows or interrupted stream courses) for loach minnow, and PCE 4 (perennial flows or interrupted stream courses) for spikedace. The management and restoration of beaver is an important component of New Mexico meadow jumping mouse conservation (USFWS 2013b) and beaver populations are likely to benefit from reestablishing PCEs. It is unknown how much designation of critical habitat will assist implementation of beaver transplantation efforts. In New Mexico, beaver can no longer be relocated or transplanted without written consent from all property owners, land management agencies, or other affected parties (e.g., irrigation districts) within an 8-kilometer (5-mile) radius of the proposed release site or connective waters (NMDGF 2009). Lack of consent will likely be the most limiting factor in beaver transplant projects in New Mexico. Lack of public support in Arizona and Colorado may also hinder transplant projects indirectly. Designation of critical habitat for the New Mexico meadow jumping mouse may increase public awareness of the importance of beavers and could therefore indirectly benefit beaver translocation projects and beaver populations. In turn, benefitting beaver populations is likely to benefit riparian habitat, and riparian associated common and special status species as described above.

The management of emergent herbaceous riparian vegetation and riparian scrub shrub is an extremely important part of managing habitat for the New Mexico meadow jumping mouse. Vegetation management to benefit other wildlife species that are associated with different vegetation types could preclude the development of PCEs in unoccupied critical habitat. For example, mowing is an indirect consequence of certain wildlife management priorities (winter waterfowl and crane habitat) on Bosque del Apache NWR, because it facilitates water delivery through canals and ditches to wetlands and crops used by these species. Mowing, in particular, removes the dense herbaceous wetland vegetation required by the New Mexico meadow jumping mouse on at least a temporary basis. However, mowing also benefits New Mexico meadow jumping mouse habitat by setting back the establishment of dense woody vegetation that is unsuitable for the New Mexico meadow jumping mouse. Development of PCEs in most areas will require rotational vegetation management that allows growth of tall emergent herbaceous vegetation in some areas each year, but utilizes techniques such as mowing to set back succession of woody species in other areas. It will also be important to manage a mosaic of vegetation types to allow for hibernation and maternal nesting in alders and willow near the

herbaceous vegetation used for all other activities. Although these conservation actions could have a large influence on vegetation, the effect on vegetation overall is likely to be moderate because these goals of developing PCEs are consistent with the goals of maintaining or restoring native vegetation on Forest Service and USFWS lands. Further discussion on how changes to mowing may affect maintenance of irrigation canals and ditches is discussed under "Water Resources and Management" below.

In summary, designation of critical habitat for the New Mexico meadow jumping mouse is likely to benefit ESA-listed, state-listed, and Forest Service and BLM sensitive species. It also would likely benefit critical habitat for other listed species. In addition it would likely benefit common fish, wildlife, and vegetation. This benefit is likely to be greater than any benefits achieved through listing the New Mexico meadow jumping mouse under the ESA alone because a much larger area would be managed to provide native riparian vegetation as described in the PCEs. However, in relation to the range of other species, the area is not large enough to cause significant increases in populations. Consequently, designation of critical habitat will have a moderate beneficial effect on fish, wildlife, and vegetation.

ALTERNATIVE C (DESIGNATION OF CRITICAL HABITAT WITH EXCLUSIONS)

The effects of this alternative on fish, wildlife, and vegetation would be the same as Alternative B except that consultations on projects would not be necessary on the unoccupied and excluded tribal lands. Any improvements to vegetation and populations of fish and wildlife from conservation actions designed to benefit the New Mexico meadow jumping mouse in Ohkay Owingeh and Isleta Pueblo units would be the result of tribal conservation efforts and not due to critical habitat designation.

FLOODPLAINS AND WETLANDS

EXISTING CONDITIONS

Because the PCEs include adjacent floodplain and upland areas extending approximately 100 m (330 ft) outward from the water's edge (as defined by the bankfull stage of streams), floodplains are included in the proposed critical habitat. Similarly, wetlands provide important habitat for the New Mexico meadow jumping mouse and are included in the proposed critical habitat units.

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require section 7 consultations under the jeopardy standard in all areas occupied by the species. Projects that may impact wetlands would require delineation of jurisdictional wetlands and an Army Corps of Engineers Section 404 permit and therefore would have a federal nexus requiring section 7 consultation under the ESA. Potential new consultations also could occur on projects designed to manage floodplains or wetlands such as riparian habitat restoration, water management and delivery, or beaver management (USFWS 2013c).

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultations under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation.

The number of consultations would be greater than in Alternative A because the majority of proposed critical habitat area is unoccupied and consultations for projects implemented on these unoccupied areas likely would not have occurred as a result of listing the species. These additional consultations would increase administrative effort for both the action agency and USFWS. However, all but four of the units are partially occupied by the New Mexico meadow jumping mouse. Additional consultations due to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied area. Most actions that would affect the hydrology and functioning of wetlands (bank stabilization, dams, and actions requiring an Army Corps of Engineers Section 404 permit) would affect flows throughout both the occupied and unoccupied sections of the creeks. These actions would require section 7 consultation as a result of listing the species. Therefore an increase in administrative effort is likely to be limited to projects on the four wholly unoccupied areas plus any small actions that occur within the unoccupied sections of the partially occupied units. Floodplains and wetlands are likely to benefit from flowing water and reestablishment of riparian vegetation that would occur in the unoccupied areas of critical habitat.

ALTERNATIVE C

The effects of this alternative on floodplains and wetlands would be the same as for Alternative B except that consultations on projects related to floodplain management would not be necessary on the excluded tribal lands (which are all unoccupied and therefore not subject to section 7 consultation under the jeopardy standard). Any improvements to floodplains and wetlands from conservation actions designed to benefit the New Mexico meadow jumping mouse in Ohkay Owingeh and Isleta Pueblo units would be the result tribal conservation efforts and not due to critical habitat designation.

WATER RESOURCES AND MANAGEMENT

EXISTING CONDITIONS

The proposed critical habitat units are found on eleven watersheds (8-digit HUCs) of New Mexico, southern Colorado, and eastern Arizona and three ecoregions (Environmental Protection Agency (EPA) 2013, U.S.D.A. Forest Service (USFS) 2013). The Arizona-New Mexico Mountains ecoregion is influenced by a moisture deficit in late spring until the arrival of summer rains and thunderstorms, followed by rains in early autumn and winter (Forest Service 2013). Stream discharges are influenced by snowmelt and monsoon storms that produce high flows in early spring and flashy and unpredictable flows in late summer. The Southern Rocky Mountain Steppe--Open Woodland--Coniferous Forest--Alpine Meadow ecoregion is characterized by winter precipitation that varies considerably with altitude (see Appendix 2, climate diagram for Pikes Peak, Colorado). Total precipitation is moderate, but greater than on the plains to the east and west. In the highest mountains, a considerable part of annual precipitation is snow, although permanent snowfields and glaciers cover only relatively small areas. Bases of these mountains receive only 10 to 20 in (260 to 510 mm) of rainfall per year. At higher elevations, annual precipitation increases to 40 in (1,020 mm), and average temperatures fall (Forest Service 2013). The Colorado Plateau ecoregion's climate is characterized by cold winters. Summer days are usually hot, but nights are cool; accordingly, the diurnal variation in temperature is considerable. Annual average temperatures are 40 to 55ºF (4 to 13ºC), decreasing with rising elevation. Average annual precipitation is about 20 in (510 mm), except on the higher mountains; some parts of the province receive less than 10 in (260 mm).

Climate change may change the abundance, distribution, and duration of surface and groundwater in the watersheds (Lenart 2008). The potential impacts of climate change on frequency, duration, and timing of flows in the main watercourses of the area are unknown. However, precipitation is projected to drop by five percent by century's end (relative to average

precipitation over the last three decades of the 20th century) for much of Arizona and New Mexico, based on results from 18 global climate models (Seager et al. 2007). Winter storms could enter the western United States in a more northerly position, bypassing the Southwest more often than it currently does. Summer precipitation may also decrease, but is more difficult to predict (Lenart 2008). Meanwhile, hotter temperatures are likely to bring higher evaporation rates. As a result, dry spells between rains can have more severe impacts on the landscape, especially in spring and summer (Lenart 2008). It is possible some smaller current water sources may dry out in spring and summer. While the Southwestern region of the United States is expected to dry out, it paradoxically is likely to see larger, more destructive flooding. Because warm air holds more water vapor than cooler air, climate models project a future increase in atmospheric water vapor along with the increase in global temperature. This creates conditions that potentially could lead to larger and more frequent floods by causing more intense, heavy rainfall events (Lenart 2008).

Lack of water from low precipitation and water diversion from streams and springs is one of the primary sources of habitat loss for the New Mexico meadow jumping mouse, threatening 7 of the 29 extant populations in all but two of the conservation areas (White Mountains and Jemez Mountains) (USFWS 2013b). Since 2011, water shortages from drought have likely caused habitat loss at Coyote Creek, San Antonio Creek, and Bosque del Apache NWR (USFWS 2013b). Water diversions have been for the purposes of wetland draining, flood control, and irrigation. Water diversions and associated land use changes can impact jumping mouse habitat directly, as well as alter hydrologic regimes necessary to provide the moist soil conditions that sustain suitable habitat (Frey 2005a, p. 63; 2006d, pp. 55–56). For example, the construction of levees and other flood control measures over the last 100 years, including draining up to 93 percent of wetlands in the Rio Grande Basin by the Middle Rio Grande Conservancy District in the 1930s, has greatly reduced the amount of New Mexico meadow jumping mouse habitat (Morrison 1988, Crawford *et al.* 1993, Scurlock 1998). Water is diverted for agricultural use in the middle Rio Grande Valley, the Sacramento Mountains, along the lower Rio Peñasco, the valleys of the Sangre de Cristo Mountains, the Florida River, Sugarite Canyon, and Coyote Creek (USFWS 2013b). So much water is being diverted in some streams that they no longer support an herbaceous zone of riparian habitat (Frey 2005a, 2006d).

The New Mexico meadow jumping mouse has been documented along some isolated patches of habitat adjacent to permanently flowing irrigation ditches, indicating that the subspecies may be able to adapt and survive in these artificially-created areas when they contain suitable dense riparian herbaceous vegetation (Morrison 1992) (Morrison 1988, Najera 1994, Frey and Wright 2012). However, most of these canals and ditches are regularly maintained by mowing, clearing, dredging, and burning of willow, grass, or forb riparian vegetation, which degrades or destroys New Mexico meadow jumping mouse habitat (Morrison 1988, Frey 2006d). These activities

have likely eliminated much of the historically suitable New Mexico meadow jumping mouse habitat and have precluded the development of suitable habitat in areas that may have the potential to develop and support New Mexico meadow jumping mouse populations (USFWS 2013b).

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultations under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated.

Federal agencies and other project proponents that are likely to consult with USFWS on projects related to water management if no critical habitat is designated include:

1) the U.S. Army Corps of Engineers (stream restoration), and

2) the U.S. Bureau of Reclamation (transportation, storage, diversion, and delivery of water)(USFWS 2013c), and

3) the USFWS (intra-Service consultations) for transportation, storage, and delivery of water on Bosque del Apache NWR (USFWS 2013c).

Project modifications in occupied areas to avoid jeopardy (USFWS 2013c) affecting water resources and management could include:

1. Implement seasonal restriction for projects occurring within a known occupied area to maintain required habitat components (dense herbaceous riparian vegetation averaging at least 61 cm (24 in) tall).

2. Relocate the project to an area outside of occupied or restorable New Mexico meadow jumping mouse habitat.

3. Reduce the size and configuration of the proposed project to avoid, reduce, or eliminate the effects to the species.

4. Avoid ground disturbing activities or reduce project elements that would eliminate or significantly reduce the size and configuration of occupied habitat patches containing dense herbaceous riparian vegetation.

5. Implement in-situ conservation (on-site conservation of this species) by reestablishing dense herbaceous riparian vegetation to expand the remaining populations and improve the degraded status of the New Mexico meadow jumping mouse within a project's action area.

6. Regularly inspect and enforce protection of occupied suitable habitat patches to ensure unauthorized activities (e.g., livestock entering exclosures; and off-road vehicle recreation) related to the proposed project do not result in loss, modification, or fragmentation of dense herbaceous riparian vegetation.

7. Offset permanent occupied habitat loss with suitable habitat that is permanently protected elsewhere within the species' range, including adequate funding to ensure that habitat is managed permanently for the protection of the species. Note: habitat loss, modification, or fragmentation on Federal lands should not be offset with protection of other Federal lands that would otherwise qualify for protection if the standards set forth in other agency guidance were applied to those lands.

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultations under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. In addition to the agencies described in the no action alternative, the BIA is likely to consult with USFWS on projects related to riparian habitat restoration if critical habitat is designated because all proposed critical habitat on lands administered by the BIA is unoccupied and projects in these unoccupied areas would not likely require consultation as a result of listing the species. The number of consultations with other federal agencies would be greater than in Alternative A because the majority of proposed critical habitat area is unoccupied and consultations for projects implemented on these unoccupied areas likely would not have occurred as a result of listing the species. These additional consultations would increase administrative effort for both the action agency and USFWS. However, all but four of the units are partially occupied by the New Mexico meadow jumping mouse. Additional

consultations due to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied area. Most actions affecting water flows would affect both unoccupied and occupied stream segments. It is unlikely that section 7 consultations will result in flow requirements solely for avoiding adverse modification of critical habitat because the flows would already be necessary for avoiding jeopardy in the occupied segments along each stream. Nevertheless, future section 7 consultations will evaluate whether proposed actions jeopardize the continued existence of the New Mexico meadow jumping mouse or adversely modify or destroy critical habitat. Each consultation will be evaluated on a case-by-case basis (50 CFR part402).

The four unoccupied units include Rio de las Vacas, Upper Rio Peñasco, Ohkay Owingeh, and Isleta Pueblo. An increase in administrative effort to conduct section 7 consultations is likely for projects with a federal nexus in these units. Section 7 consultations for these areas may require projects to maintain flows in these stream stretches to avoid adverse modification or destruction of critical habitat and to allow for development of riparian vegetation as described in the PCEs. These flow requirements would not be essential to avoid jeopardy to the species because these areas are unoccupied. Specific requirements would vary from project to project and each consultation will be evaluated on a case-by-case basis (50 CFR part402).

Actions must destroy or preclude the development or reestablishment of PCEs to cause adverse modification. Short-term, one-time actions that may remove vegetation structure only within one year are unlikely to preclude the development of PCEs in future years and consequently are unlikely to require modification. In contrast, actions that are repeated from year to year (such as annual mowing), or permanently preclude PCEs (such as diversion of flowing water or actions causing a reduction in base flows) would likely require project modifications.

Each of the partially occupied units has unoccupied sections along the same streams as the occupied sections. Therefore actions such as surface diversions or groundwater pumping that would affect water resources in the unoccupied sections would also be likely to affect the occupied sections of each stream. Conservation measures for these actions would already be implemented for avoiding jeopardy to the species. Similarly, conservation actions to address flood control activities would already be implemented to avoid jeopardy to the species.

The four completely unoccupied units include Rio de las Vacas, Upper Rio Peñasco, Ohkay Owingeh, and Isleta Pueblo. Each of these units does not currently contain suitable vegetation, but does have perennial flowing water with saturated soils and a high potential of being restored to suitable habitat (U.S. Fish and Wildlife Service (USFWS) 2013). The Rio de las Vacas subunit is on the Santa Fe National Forest. There are two groundwater wells and one diversion in the Rio Cebolla sub-basin (New Mexico Office of the State Engineer 2010). The Upper Rio Peñasco subunit is on the Lincoln National Forest near the National Solar Observatory Experimental

Area. There are no groundwater wells or diversions on the Rio Peñasco in the vicinity of the proposed critical habitat unit although there are many in the Rio Peñasco sub-basin (New Mexico Office of the State Engineer 2010). The Ohkay Owingeh unit is on the Ohkay Owingeh Reservation. There are eleven diversions on the Middle Rio Grande and numerous wells in the Rio Chama watershed (New Mexico Office of the State Engineer 2010). The Isleta Pueblo unit is on the Isleta Pueblo. The Pueblo has one diversion on the Middle Rio Grande (New Mexico Office of the State Engineer 2010). These wells and diversions would only be affected by critical habitat designation if a new action is proposed and that action has a federal nexus.

No dams for flood control are in the vicinity of the Rio de las Vacas or Upper Rio Peñasco subunits. Dams for flood and sediment control in the vicinity of the Ohkay Owingeh or Isleta Pueblo units include the Abiquiu Dam, Cochiti Dam, Galisteo Dam, and Jemez Canyon Dam (Middle Rio Grande Bosque Initiative 2009). Possible modifications to dam operations could be recommended if dam operations alter flows to the proposed critical habitat units. Modifications would depend on the proposed action to dam operation and would be developed during the section 7 consultation process. As with other actions, actions on private or state land would not be affected unless there is a federal nexus.

Project modifications to avoid adverse modification of unoccupied critical habitat that may affect water management include (USFWS 2013c):

1. Relocate the project to an area outside of New Mexico meadow jumping mouse critical habitat.

2. Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to unoccupied critical habitat.

3. Avoid ground disturbing activities or reduce project elements that would preclude the development of habitat patches containing dense herbaceous riparian vegetation.

4. Implement in-situ conservation (on-site conservation of this species) by restoration of dense herbaceous riparian vegetation to expand the remaining populations and improve the degraded status of the New Mexico meadow jumping mouse within a project's action area. Conservation measures that may affect water management include encouraging the reestablishment of beaver through habitat enhancement or active translocation, or ensuring that a constant supply of water is provided throughout the stream, ditch, or canal during the growing season.

5. Reduce or retire water consumptive stressors (such as water diversion) to offset impacts or provide a constant supply of water for vegetation regeneration.

These project modifications may have a minor to moderate negative effect on irrigation practices, water diversions, and water uses. No effects to flood control efforts are anticipated. The effects of project modifications due solely to critical habitat designation may only be minor because most units are partially occupied. Unoccupied and occupied areas of each partially occupied unit are located along the same watercourses, so water diversions or other actions reducing stream flows in the unoccupied areas also are likely to affect the occupied areas. Therefore, project modifications to retain adequate flows would already be necessary to avoid jeopardy to the species in the occupied sections. In contrast, canal maintenance activities, such as mowing and dredging, would require modification in unoccupied areas to allow for the development of PCEs. These modifications would be due to critical habitat designation and could have a minor to moderate effect on water management.

Conservation actions to re-establish PCEs in unoccupied critical habitat are likely to have a minor positive effect on water resources (water quality and quantity) because the reestablishment of riparian vegetation would slow flows, increase filtration, and reestablish hydrologic function both within the critical habitat units and areas downstream of the units.

ALTERNATIVE C

The effects of this alternative on water use and management would be the same as for Alternative B except that section 7 consultations on projects related to water use and management would not be necessary on the excluded tribal lands (which are all unoccupied and therefore not subject to section 7 consultation under the jeopardy standard).

LIVESTOCK GRAZING

EXISTING CONDITIONS

Livestock grazing occurs on all or portions of six of the of the eight conservation areas (USFWS 2013b). Livestock grazing does not occur at Bosque del Apache NWR or the private land containing the occupied area on the Florida River Unit. Livestock grazing in the proposed critical habitat units currently only has a federal nexus on Forest Service lands. The Santa Fe, Carson, Lincoln, and Apache-Sitgreaves National Forests each contain occupied habitat for the New Mexico meadow jumping mouse and administer grazing in those areas through grazing allotment management plans.

Historic, current, and future livestock grazing is the main source of habitat loss for the New Mexico meadow jumping mouse and currently threatens all or portions of six of the eight

conservation units (USFWS 2013b). Most importantly, livestock grazing directly decreases herbaceous riparian vegetation cover during the short season when jumping mice are active, reducing cover and food for the species (Frey 2005, Frey and Malaney 2009, Frey 2011, USFWS 2013b). Livestock grazing also can impact riparian communities by causing the replacement of sedges by grasses, the decline in herbaceous plant diversity, and the loss of riparian shrubs (especially willow and alder) (Belsky *et al*. 1999, Frey 2011). The effects of livestock grazing, particularly excessive grazing, can also result in long-term impacts that cause soil erosion and compaction, and hydrologic changes such as streambank destabilization, downcutting, and headcutting, which can further degrade jumping mouse habitat by reducing water availability for riparian plants (Belsky *et al*. 1999, Frey 2005, Frey and Malaney 2009, Frey 2011, USFWS 2013b). Hydrologic changes can lower water tables, which can affect stream flows and change microclimates from moist to mesic or xeric, which could lead to a decrease in the invertebrate community upon which the New Mexico meadow jumping mouse depends when it first emerges from hibernation (Morrison 1991, Belsky *et al.* 1999, Giuliano and Homyack 2004, Forest Service 2006). Livestock also can also cause burrows to collapse (USFWS 2013b). Research has shown that the jumping mouse does not persist in areas when its habitat is subjected to heavy grazing pressure (USFWS 2013b). Furthermore, not all previous modifications to grazing have been successful in protecting New Mexico meadow jumping mouse habitat. Allotment management plans call for utilization levels that are too high, and allotments are not regularly monitored (USFWS 2013b). No new livestock exclosures have been installed in recent years. Moreover, all of the exclosures are too small to provide habitat for large, resilient populations of jumping mice. Frequently, the fences are broken by weather, cattle, or wildlife; gates are left open, wires are cut; or the fences are burned in wildfires (USFWS 2013b).

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultations under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated.

Agencies likely to consult on livestock grazing projects if no critical habitat is designated include (USFWS 2013c):

1. U.S. Forest Service (livestock grazing allotment management plans and Forest planning).

See Alternative A under “water resources” above for project modifications that are likely to be proposed to avoid jeopardy to the species.

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultations under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. The number of consultations could be greater than in Alternative A, increasing administrative effort for both the action agency and USFWS, because the majority of proposed critical habitat area is unoccupied. Approximately 3021 ha (7466 ac) of the proposed critical habitat units are administered by the Forest Service and subject to section 7 consultations on grazing allotment management plans. The only Forest Service lands on proposed critical habitat units that are completely unoccupied are on the Rio de las Vacas and Upper Peñasco units (350 ha; 864 ac); the rest of the units are partially occupied. Additional consultations due to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied area. Grazing allotment plans encompass large areas and are not likely to encompass lands wholly outside of critical habitat, therefore it is unlikely that additional consultations on grazing allotment plans would be necessary as a result of critical habitat designation.

Because the main factor making the jumping mouse vulnerable to extinction is the loss of suitable habitat, proposed critical habitat units must be protected and allowed to regrow the needed vegetation for suitable jumping mouse habitat, particularly those that contain unoccupied areas. Because the jumping mouse populations are currently small and isolated from one another, the survival and recovery of the species will require expanding the size of currently occupied areas containing suitable habitat. Expanding the size would require regenerating suitable habitat in currently unoccupied areas that need to reestablish suitable conditions.

Regeneration of suitable habitat within Forest Service grazing allotments will involve modifying or limiting actions that preclude the development of PCEs. During section 7 consultation for unoccupied areas, it is anticipated that some conservation measures will need to be implemented to avoid destruction or adverse modification. Therefore, proposed actions, such as continued livestock grazing on Forest Service lands, which significantly decrease expansion areas, reduce the ability of the species to expand within its historical range, or preclude the ability of the jumping mouse to connect to other occupied areas could result in a determination of adverse modification.

It is possible that activities may affect the character of the physical habitat to such an extent that critical habitat may be adversely modified and not result in direct or indirect affects to jumping mouse populations such that it would jeopardize the species. This is because projects may occur wholly outside of the areas considered currently occupied habitat. As an example, many of the jumping mouse populations located within Forest Service grazing allotments are within livestock exclosures that are not part of the overall grazing allotment (i.e., grazing is not permitted within the exclosure). It is possible that a consultation for the jumping mouse would result in an informal consultation because livestock are not permitted or authorized to enter or graze within the exclosure. If livestock enter the exclosure, this would be considered unauthorized and not part of the consultation. Alternatively, grazing throughout the remaining areas of the allotment, outside of exclosures, would be occurring within unoccupied critical habitat and are likely to result in adverse effects to the PCEs. Consequently, these different levels of section 7 consultation would cause an increase in administrative effort to develop measures to avoid the adverse modification, without similar measures to avoid jeopardy. Incremental effects can be anticipated for some ongoing or future Federal actions, including developing and implementing conservation measures that may differ between currently occupied and unoccupied critical habitat and habitat for the jumping mouse. Therefore, incremental costs associated with section 7 consultation on Forest Service grazing allotments would be both administrative costs and the actual costs for implementing measures needed to avoid adverse modification in unoccupied areas.

Both Isleta Pueblo and Ohkay Owingeh are completely unoccupied and any potential consultations on grazing would be due to the designation of critical habitat. Both Pueblos are developing plans to protect riparian areas and the extent of grazing would depend on the outcome of these plans. If grazing does occur in the proposed critical habitat, it would be subject to ESA section 7 consultation only if the grazing project has a federal nexus (i.e. federal funding, authorization, or permitting).

Project modifications to avoid adverse modification of unoccupied critical habitat that may affect livestock grazing include (USFWS 2013c):

1. Relocate the project to an area outside of jumping mouse critical habitat.

2. Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to unoccupied critical habitat.

3. Avoid ground disturbing activities or reduce project elements that would preclude the development of habitat patches containing dense herbaceous riparian vegetation.

4. Implement in-situ conservation (on-site conservation of this species) by restoration of dense herbaceous riparian vegetation to expand the remaining populations and improve

the degraded status of the jumping mouse within a project's action area. Conservation measures would likely include protection of riparian areas through fencing, changing the timing or duration of the action (e.g., dormant season grazing), encouraging the reestablishment of beaver through habitat enhancement or active translocation, or ensuring that a constant supply of water is provided throughout the stream, ditch, or canal during the growing season.

6. Reduce or retire water consumptive stressors (such as water diversion) to offset impacts or provide a constant supply of water for vegetation regeneration.

7. Modify livestock grazing activities through fencing, reconfiguration of grazing units, off-site water development, and seasons of use.

Maintenance of PCEs concurrent with livestock grazing appears unlikely considering the impacts livestock grazing has on New Mexico meadow jumping mouse habitat. However, if livestock grazing practices are created that do not preclude the development of PCEs, they could possibly be used. Additionally, as with mowing, livestock grazing on a carefully monitored rotational basis could be used to set back succession of woody shrubs if other PCES are not precluded (such as stable stream banks allowing flowing water and soils that are not too compacted to allow for regrowth of riparian vegetation). If suitable practices are not created, designation of critical habitat would impact livestock grazing, primarily due to the costs of potential modifications such as herding or building exclosures. Economic costs are considered in a separate economic analysis and discussed in the “Socioeconomics” chapter of this EA. Because critical habitat would comprise only a very small portion of each allotment, and suitable forage is available throughout the remainder of the allotments, the impact on forage would be minor.

ALTERNATIVE C

The effects of this alternative on livestock grazing would be the same as for Alternative B except that section 7 consultations on projects related to livestock grazing would not be necessary on the excluded tribal lands (which are all unoccupied and therefore not subject to section 7 consultation under the jeopardy standard).

AGRICULTURE

EXISTING CONDITIONS

Agricultural uses within the vicinity of proposed critical habitat include haying (alfalfa, oats, or other hay) in or near the Sugarite Canyon, Coyote Creek, Rio Cebolla, Rio de las Vacas, Isleta Pueblo, Ohkay Owingeh, and Florida River subunits; and apples or cherries near Middle Rio Peñasco and Wills Canyon subunits (U.S. Department of Agriculture National Agricultural Statistics Service 2013). These agricultural uses all occur on private land.

Prime agricultural land is defined (7 U.S.C. 4202(a)) as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and also is available for these uses. No prime agricultural land occurs within the proposed critical habitat (NRCS 1997). The closest prime agricultural land is 2.5 miles from Unit 8 (NRCS 1997).

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultations under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated.

All agriculture in the proposed critical habitat is conducted on private land. Section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation.

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultation under the adverse modification standard as well as the jeopardy standard. Agricultural uses occur only on the

private land within the proposed critical habitat. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. No known federal actions are associated with agricultural uses of the proposed critical habitat; therefore the designation of critical habitat would not affect agricultural uses. Prime agricultural land would not be affected by critical habitat designation.

ALTERNATIVE C

The effects of this alternative on agriculture would be the same as for Alternative B except that any section 7 consultations, if they occur, on projects related to agriculture would not be necessary on the excluded tribal lands, which are all unoccupied and therefore not subject to section 7 consultation under the jeopardy standard.

FIRE MANAGEMENT

EXISTING CONDITIONS

Low-intensity fire and non-scouring floods are natural components of jumping mouse habitat. These normal disturbance events may help maintain riparian communities in an early seral stage, which would provide suitable habitat for the jumping mouse (USFWS 2013b). However, intense wildfire can extirpate jumping mouse populations by causing direct mortality of mice, by burning riparian habitat, by altering soils to the point where riparian vegetation cannot exist, by contributing to erosion of uplands or creek banks, or by causing scouring floods or siltation of creeks. Intense wildland fires are associated with habitat loss at all but 2 of the 29 existing locations of New Mexico meadow jumping mouse (USFWS 2013b). In particular, the 218,000 ha (538,000 ac) Wallow Fire in Arizona likely caused the extirpation of 5 of the 12 populations in the White Mountains in 2011. Also in 2011, the 11,247 ha (27,792 ac) Track Fire in Colorado likely caused significant impacts to the Sugarite population of New Mexico. In addition, most of the areas around 12 out of 13 Arizona locations were burned by the Wallow Fire in 2011 and these areas are profoundly at risk of degradation from ash and sediment erosion during subsequent storm-water flows (Forest Service 2011, Frey 2011b). Following these fires, USFWS found that, depending on fire intensity and the subsequent ash and debris flow within stream reaches, jumping mouse populations can be significantly affected and likely extirpated, even when 15 km (9 mi) of continuous suitable habitat existed prior to the fire, such as occurred at Sugarite Canyon (Frey 2006d, 2012b). The severity of wildfires is likely to increase as a result of

climate change, and within riparian areas as a result of reduced vegetation moisture caused by dewatering of streams and loss of saturated soils. Fire management is necessary to prevent further extirpations of New Mexico meadow jumping mouse populations from intense wildfires.

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultations under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated.

Agencies likely to consult on fire management projects if no critical habitat is designated include (USFWS 2013c):

1. U.S. Army Corps of Engineers (post-fire stabilization).
2. U.S. Forest Service (fire management plans, fire suppression, fuel reduction treatments, forest plans).
3. U.S. Fish and Wildlife Service (Intra-Service consultation with Bosque del Apache NWR for fire management planning and projects).

See Alternative A under “water resources” above for project modifications that are likely to be proposed to avoid jeopardy to the species.

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultations under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. In addition to the agencies described in the no action alternative, the BIA is likely to consult with USFWS on fire management planning if critical habitat is designated because all proposed critical habitat on lands administered by the BIA is unoccupied and projects in these unoccupied areas would not likely require consultation as a result of listing the species. The number of consultations with other federal agencies would

be greater than in Alternative A because the majority of proposed critical habitat area is unoccupied and consultations for projects implemented on these unoccupied areas likely would not have occurred as a result of listing the species. These additional consultations would increase administrative effort for both the action agency and USFWS. However, all but four of the units are partially occupied by the New Mexico meadow jumping mouse. Additional consultations due to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied area. Most fire management projects, such as fire management plans, fuel reduction efforts, and fire suppression would occur over large areas and are not likely to occur wholly outside of critical habitat. Therefore an increase in administrative effort is likely to be limited to projects on the four wholly unoccupied areas plus any small actions that occur within the unoccupied sections of the partially occupied units. In addition, actions must preclude the development of PCEs to cause adverse modification. Short-term, one-time actions that may remove vegetation structure only within one year are unlikely to preclude the development of PCEs in future years and consequently are unlikely to require modification. In contrast, actions that repeatedly or permanently preclude PCEs would likely require project modifications.

Prevention of intense wildfire that destroys riparian habitat will be important for developing PCEs in unoccupied critical habitat. As a result, most fire management projects that prevent intense wildfire are likely to enhance conservation of the New Mexico meadow jumping mouse and not require extensive project modification as a result of critical habitat being present. Possible fire management project modifications that may be necessary to avoid adverse modification of unoccupied critical habitat which may affect fire management projects include (USFWS 2013c):

1. Relocate the project to an area outside of New Mexico meadow jumping mouse critical habitat.

2. Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to unoccupied critical habitat.

3. Avoid ground disturbing activities or reduce project elements that would preclude the development of habitat patches containing dense herbaceous riparian vegetation.

4. Modify off-road vehicle management through fencing, signage, education, and timing of use.

The first two project modifications are not likely to be necessary for fuels reduction treatments or wildfire suppression efforts, with the possible exception of fire camps and some large firebreaks. Although the last item is directed at recreation OHV use, it may also impact some fire management activities because OHVs are frequently used in fuels reduction treatments and fire

suppression efforts. Overall, the effects of critical habitat designation on fire management are likely to be minimal because the above project modifications would be the only impacts, and they would not likely preclude implementation of fuels reduction treatments or wildfire suppression efforts.

ALTERNATIVE C

The effects of this alternative on fire management would be the same as for Alternative B except that section 7 consultations on projects related to fire management would not be necessary on the excluded tribal lands, which are all unoccupied and therefore not subject to section 7 consultation under the jeopardy standard.

HIGHWAY OR ROAD CONSTRUCTION AND RECONSTRUCTION

EXISTING CONDITIONS

Highway or road construction and reconstruction can directly destroy or modify jumping mouse habitat. In addition to direct loss of habitat, road construction has the potential for indirect effects such as increased soil erosion, road maintenance (e.g., mowing or salting), or flooding that could destroy or modify jumping mouse habitat (USFWS 2013b). Highway or road reconstruction can also fragment habitat. One bridge has already fragmented a New Mexico meadow jumping mouse population by removing habitat in the middle of the population (USFWS 2013b). Highway or road reconstruction is identified as a past, present, or future source of habitat loss at four of the existing populations including Coyote Creek, Fenton Lake Marsh, Fenton Lake Day Use Area, and Nutrioso Creek (USFWS 2013b). Within the canyon of Coyote Creek, segments of New Mexico State Highway 434 are scheduled to be realigned in the next few years by the New Mexico Department of Transportation; a jumping mouse population occurs within a beaver pond complex within the highway segment to be realigned (USFWS 2013b). The USFWS also is currently involved in discussions with the New Mexico Department of Transportation on another bridge reconstruction project located within potential jumping mouse habitat on Isleta Pueblo (USFWS 2013b).

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultations under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated.

Agencies likely to consult on highway or road construction projects if no critical habitat is designated include (U.S. Fish and Wildlife Service 2013c):

- U.S. Army Corps of Engineers (bridge and road realignment projects).
- Federal Highways Administration (highway and bridge construction and maintenance).

See Alternative A under "water resources" above for project modifications that are likely to be proposed to avoid jeopardy to the species.

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultations under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. Agencies likely to consult are the same as those listed for Alternative A, above, plus the BIA because all proposed critical habitat on lands administered by the BIA is unoccupied and projects in these unoccupied areas would not likely require consultation as a result of listing the species. The number of consultations with other federal agencies would be greater than in Alternative A because the majority of proposed critical habitat area is unoccupied and consultations for projects implemented on these unoccupied areas likely would not have occurred as a result of listing the species. These additional consultations would increase administrative effort for both the action agency and USFWS. However, all but four of the units are partially occupied by the New Mexico meadow jumping mouse. Additional consultations due to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied area. Actions must preclude the development of PCEs to cause adverse modification. Actions that permanently preclude PCEs, such as new highway or bridge construction, would likely

require project modifications. Road project modifications to avoid adverse modification of unoccupied critical habitat (USFWS 2013c) which may affect road construction or reconstruction include:

1. Relocate the project to an area outside of jumping mouse critical habitat.

2. Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to unoccupied critical habitat.

3. Avoid ground disturbing activities or reduce project elements that would preclude the development of habitat patches containing dense herbaceous riparian vegetation.

4. Implement in-situ conservation (on-site conservation of this species) by restoration of dense herbaceous riparian vegetation to expand the remaining populations and improve the degraded status of the jumping mouse within a project's action area. Conservation measures would likely include protection of riparian areas through fencing, changing the timing or duration of the action (e.g., dormant season grazing), encouraging the reestablishment of beaver through habitat enhancement or active translocation, or ensuring that a constant supply of water is provided throughout the stream, ditch, or canal during the growing season.

These project modifications could have a minor impact on highway construction or reconstruction because they may cause projects to be moved or redesigned, causing them to be more difficult or costly to engineer. The number of affected projects is unknown because agencies contacted by USFWS have not identified potential highway or road construction and reconstruction projects.

ALTERNATIVE C

The effects of this alternative on road construction and reconstruction would be the same as for Alternative B except that section 7 consultations on projects related to road construction and reconstruction would not be necessary on the excluded tribal lands, which are all unoccupied and therefore not subject to section 7 consultation under the jeopardy standard.

DEVELOPMENT

EXISTING CONDITIONS

Past residential and commercial development has destroyed and fragmented habitat directly as well as degrading or destroying habitat indirectly through water withdrawal and highway or other infrastructure development. Development is considered to likely have extirpated populations of the jumping mouse in Albuquerque and Española along the Rio Grande, in Taos Ski Valley and in the Sacramento Mountains, New Mexico (Hafner et al. 1981, Frey 2005, New Mexico Department of Game and Fish 2012). Development is a source of habitat loss or degradation to 10 of the 29 locations that have been found since 2005 (USFWS 2013b). Future development, which is particularly likely to occur on private lands, could cause further loss and fragmentation of habitat as well as altering hydrologic regimes and fire regimes, withdrawing water from streams or aquifers, and introducing nonnative plants or animals.

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultation under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated.

Agencies likely to consult on projects that may occur concurrently with development if no critical habitat is designated include (USFWS 2013c):

- U.S. Army Corps of Engineers (Section 404 permits).
- Federal Highways Administration (highway and bridge construction and maintenance).
- U.S. Bureau of Reclamation (transportation, storage, diversion, and delivery of water).

See Alternative A under “water resources” above for project modifications that are likely to be proposed to avoid jeopardy to the species.

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultation under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. Agencies likely to consult are the same as those listed for Alternative A, above, plus the BIA because all proposed critical habitat on lands administered by the BIA is unoccupied and projects in these unoccupied areas would not likely require consultation as a result of listing the species. The number of consultations with other federal agencies would be greater than in Alternative A because the majority of proposed critical habitat area is unoccupied and consultations for projects implemented on these unoccupied areas likely would not have occurred as a result of listing the species. These additional consultations would increase administrative effort for both the action agency and USFWS. However, all but four of the units are partially occupied by the New Mexico meadow jumping mouse. Additional consultations due to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied area. Project modifications to avoid adverse modification of unoccupied critical habitat (USFWS 2013c) which may affect development include:

1. Relocate the project to an area outside of jumping mouse critical habitat.

2. Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to unoccupied critical habitat.

3. Avoid ground disturbing activities or reduce project elements that would preclude the development of habitat patches containing dense herbaceous riparian vegetation.

4. Implement in-situ conservation (on-site conservation of this species) by restoration of dense herbaceous riparian vegetation to expand the remaining populations and improve the degraded status of the jumping mouse within a project's action area. Conservation measures would likely include protection of riparian areas through fencing, changing the timing or duration of the action (e.g., dormant season grazing), encouraging the reestablishment of beaver through habitat enhancement or active translocation, or ensuring that a constant supply of water is provided throughout the stream, ditch, or canal during the growing season.

These project modifications could have a moderate impact on development projects where they occur because they may impact the complexity of design and increase costs for projects. Consultation and project modifications would only be required when the development has a federal nexus, however, and no anticipated construction projects with a federal nexus have been

identified. Because no projects have been identified, effects to development are not expected to occur.

ALTERNATIVE C

The effects of this alternative on development would be the same as for Alternative B except that section 7 consultations on projects related to development would not be necessary on the excluded tribal lands, which are all unoccupied and therefore not subject to section 7 consultation under the jeopardy standard.

ENERGY RESOURCES

EXISTING CONDITIONS

No solar or wind energy development currently occurs within the area proposed for critical habitat. We are not aware of any proposed solar or wind development within the area. Conventional gas extraction involves extracting natural gas from permeable rock formations such as siltstones, sandstones, and carbonates. Conventional oil and gas extraction also does not currently occur within the proposed critical habitat, and we are aware of no proposed oil or gas extraction.

Production of natural gas from coal seams is considered unconventional gas extraction. Unconventional gas extraction involves extracting natural gas from lower-permeability, harder-to-produce formations, such as shale plays, coal basins, and tight gas sands (U.S. Environmental Protection Agency 2013). The natural gas contained in and removed from coal seams is called coalbed methane or CBM (U.S. Environmental Protection Agency 2013). Extraction of CBM requires drilling and pumping the water from the coal seam, which reduces the pressure and allows CBM to release from the coal. CBM extraction often produces large amounts of water which can be reused, put into holding ponds to evaporate or infiltrate, shipped off-site to be treated, or dumped into surface waters if they do not violate water quality standards (EPA 2010). The water produced during CBM extraction is called “produced water.” Produced water from CBM operations primarily consists of formation water, i.e., the water contained within the coal formation; in some cases, it may include wastewater from drilling activities (U.S. Environmental Protection Agency 2013). The infrastructure for CBM extraction sites typically comprises the well pad, gathering system pumps and pipelines, storage tanks, and treatment equipment (U.S. Environmental Protection Agency 2013).

Coalbed methane (CBM) exploration and production has the potential to fragment or eliminate habitat of the New Mexico meadow jumping mouse within Sugarite Canyon, New Mexico and the Florida River and Sambrito Creek, Colorado (USFWS 2013b). CBM development in the San Juan Basin occurs in the same area as the proposed critical habitat unit near Sambrito Creek (EPA 2010).

Coalbed methane could potentially impact New Mexico meadow jumping mouse and critical habitat by causing one or more of the following:

- Direct loss of habitat to well pumps and pads and access roads.
- Indirect impacts to habitat from siltation and compaction around pumps and pads and access roads.
- Lowering groundwater tables and therefore reducing water available to streams and wetlands.
- Altering water quality if surface water discharge is practiced.
- Altering stream hydrographs if surface water discharge is practiced.

Direct habitat loss may include ground disturbance for roads, drilling pads that average about 0.2 hectare (0.5 acres), pipelines, and utilities (National Park Service 2003). The amount and extent of indirect habitat alterations from siltation or compaction is unknown. Groundwater extraction could reduce the availability of groundwater for springs and wetlands that support habitat for the New Mexico meadow jumping mouse. Existing CBM development has depleted 65 acre feet of water per year from the Animas, Florida, and Pine Watersheds (BLM and Forest Service 2006). However, existing CBM development has not likely had any noticeable effect on flows in these three rivers because the depletions are several orders of magnitude smaller than mean flows (Forest Service and Bureau of Land Management 2003). Additional impacts may occur to areas off the coalbed methane development site including changes in water quality and quantity or altered flooding characteristics of surface waters receiving CBM discharge (National Park Service 2003, Environmental Protection Agency (EPA) 2010). The San Juan Basin is likely to be a zero discharge area (U.S. Environmental Protection Agency 2013). However, the Raton Basin could have produced water discharged to surface water (U.S. Environmental Protection Agency 2013). Nationally, approximately 45 percent of all produced water is discharged to waters of the United States and discharges may have the following impacts on surface waters (EPA 2010):

• Various pollutants such as sodium, calcium, and magnesium (used to calculate the sodium adsorption ratio [SAR]), total suspended solids (TSS), and metals (e.g.,

selenium, chromium) are present in discharges.
• Surface water discharges of produced water can increase stream volume, streambed erosion, suspended sediment, and salinity.
• Pollutants from CBM discharges may negatively affect fish populations over time.
• Surface impoundment and land application of produced waters may impact groundwater from infiltration and the concentration and/or bioaccumulation of CBM-associated pollutants.

Federal permitting or authorization of coalbed methane development could include: 1) authorization of surface activities by land management agencies; or 2) permitting, regulation, or leasing of CBM extraction and produced water discharge. Federal land management agencies with potential Coalbed Methane in the region that would authorize surface activities include the Forest Service and BLM. A joint EIS was produced by the Forest Service and BLM in 2006 that addressed coalbed methane extraction in the Florida River area that is proposed for critical habitat. This EIS did not address the New Mexico meadow jumping mouse or its habitat. Only six acres of proposed critical habitat in areas with potential for coalbed methane development occur on BLM lands. The BLM does not anticipate consultation for CBM development on any of the critical habitat units (BLM 2013). The critical habitat proposed on Forest Service lands does not have potential for coalbed methane development. This lack of CBM potential on BLM and Forest Service lands indicates consultation concerning surface management is not likely. In addition to managing surface lands, the BLM manages all federally owned subsurface minerals. In the case of oil and gas on NFS lands, it is responsible for permit approval and for monitoring subsurface activities related to exploration and development (USFS and BLM 2006). BLM's monitoring role includes administering all federal regulations that pertain to subsurface oil and gas, regardless of the agency that administers the surface resources (USFS and BLM 2006). Regulations concerning produced water would be administered by the EPA, and are also unlikely. EPA is proposing to delist from the effluent guidelines plan the rulemaking for the Coalbed Methane Extraction subcategory based on new information regarding the declining prevalence and economic viability of this industry, due in large part to the increased extraction of natural gas from other sources, such as shale formations (78 FR 48159). Current Federal regulations apply to the two most common methods of handling CBM produced water. If the water is discharged to a surface stream, it must be done under an NPDES permit or a federally compliant state equivalent. If the water is disposed of by underground injection, it must be to a Class II Disposal Well.

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultations under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated.

No federal agencies have indicated that they are likely to consult on coalbed methane extraction. If produced water is discharged to surface streams, EPA may issue a NPDES permit, triggering section 7 consultation between the EPA and FWS. It is unlikely that other section 7 consultations for CBM development will occur on Federal land as a result of listing.

Because there is no consultation history for coalbed methane extraction and jumping mouse, it is difficult to predict possible project modifications. See Alternative A under "water resources" above for general project modifications that are likely to be proposed to avoid jeopardy to the species.

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultations under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. Agencies likely to consult are the same as those listed for Alternative A, above.

No federal agencies have indicated that they are likely to consult on coalbed methane extraction if critical habitat is designated. If produced water is discharged to surface streams, EPA may issue a NPDES permit, triggering section 7 consultation between the EPA and FWS. Depending on the specifics of where CBM development may occur on federal land, it is possible the consultation for the Northern San Juan Basin Coal Bed Methane Development will need to be reviewed and potentially reinitiated as a result of listing or critical habitat designation.

However, all three of the units potentially threatened by coalbed methane extraction (Sugarite Canyon, Florida River, and Sambrito Creek) are partially occupied by the New Mexico meadow jumping mouse. Additional consultations due to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied

area. Direct and indirect habitat loss caused by pumpjacks, roads, and other infrastructure may occur solely on unoccupied portions of critical habitat units, but effects from groundwater use or produced water would also affect the occupied sections. Therefore consultations and project modifications would likely be necessary under the jeopardy standard regardless of critical habitat designation. Project modifications to avoid adverse modification of unoccupied critical habitat (USFWS 2013c) which may affect coalbed methane extraction would include:

1. Relocate the project to an area outside of jumping mouse critical habitat.

2. Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to unoccupied critical habitat.

3. Avoid ground disturbing activities or reduce project elements that would preclude the development of habitat patches containing dense herbaceous riparian vegetation.

4. Implement in-situ conservation (on-site conservation of this species) by restoration of dense herbaceous riparian vegetation to expand the remaining populations and improve the degraded status of the jumping mouse within a project's action area. Conservation measures would likely include protection of riparian areas through fencing, changing the timing or duration of the action (e.g., dormant season grazing), encouraging the reestablishment of beaver through habitat enhancement or active translocation, or ensuring that a constant supply of water is provided throughout the stream, ditch, or canal during the growing season.

5. Reduce or retire water consumptive stressors (such as water diversion) to offset impacts or provide a constant supply of water for vegetation regeneration.

Because there is no consultation history for coalbed methane extraction and jumping mouse, it is difficult to predict possible project modifications. However, it is likely that project modifications also would address reducing potential stressors caused by increased water flows (e.g. erosion) and pollutants.

Although project modifications are possible due solely to designation of critical habitat, the extent of these modifications is likely to be minor in comparison to those required to avoid jeopardy because effects to water quality and quantity would also affect occupied critical habitat which occurs on the same streams as the unoccupied critical habitat. Construction of pumpjacks or other infrastructure in unoccupied areas of critical habitat may need to be modified or relocated as part of project modifications resulting from critical habitat designation. These modifications are likely to have no more than minor impacts on CBM project implementation. Some project modifications are likely to be proposed to minimize changes to perennial flows in critical habitat. The effects of these project modifications are also likely to be minor because

most units are partially occupied. Unoccupied and occupied sections of each partially occupied unit are located along the same watercourses, so groundwater extractions for CBM development or CBM discharges affecting stream flows in the unoccupied sections also are likely to affect the occupied areas. Therefore, project modifications to retain adequate flows would already be necessary to avoid jeopardy to the species. In addition, unoccupied critical habitat only occurs on a very small area of CBM development in the region. As a result of the minimal acreage affected and the need for project modifications to avoid jeopardy to the species, effects to coalbed methane development due to designation of critical habitat for the New Mexico meadow jumping mouse are likely to be minor.

ALTERNATIVE C

The effects of this alternative on coalbed methane extraction would be the same as for alternative B because no coalbed methane is located near the tribal units being considered for exclusion.

RECREATION

EXISTING CONDITIONS

Campers and anglers easily damage riparian vegetation by trampling and creating trails (Forest Service 2005). Off-highway vehicle (OHV) use can cause damage such as destroying vegetation, compacting soils, increasing erosion, and causing sedimentation in rivers and streams. Recreational impacts (e.g., barren ground, trampled plants, multiple trails, and vehicle tracking from all-terrain vehicles and motorcycles) can be severe, and have been documented in riparian areas around historic New Mexico meadow jumping mouse populations that are now extirpated (Frey 2005).

These recreational uses and their impacts occur throughout the Forest Service managed areas of proposed critical habitat. Four jumping mouse populations are located within or adjacent to heavily used campgrounds (San Antonio, Coyote Creek, Sugarite Canyon, and Fenton Lake), while many other recently documented populations within the Jemez and White Mountains and Sambrito Creek are immediately adjacent to areas heavily used by dispersed camping (Ortega 2003; Forest Service 2005; Frey 2005a;2011). These populations are surrounded by riparian habitat that is currently fragmented or unsuitable for the jumping mouse due, in part, to unregulated recreational impacts in and around developed campgrounds or dispersed campsites.

Recreational uses on the Bosque del Apache NWR include hunting, wildlife viewing, photography, fishing, and frogging (USFWS 2013a). Vehicles must remain on established roads.

Recreation is most popular in fall and winter, when jumping mice are not active. Camping is not allowed.

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultations under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated.

Agencies likely to consult on recreation projects if no critical habitat is designated include (USFWS 2013c):

- U.S. Forest Service (recreational use, and travel management plans).
- U.S. Fish and Wildlife Service (National Wildlife Refuge planning and projects).

See Alternative A under "water resources" above for project modifications that are likely to be proposed to avoid jeopardy to the species.

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultation under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section 7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. Agencies likely to consult are the same as those listed for Alternative A, above.

The number of consultations would be greater than in Alternative A because the majority of proposed critical habitat area is unoccupied and consultations for projects implemented on these unoccupied areas likely would not have occurred as a result of listing the species. These additional consultations would increase administrative effort for both the action agency and USFWS. However, all but four of the units are partially occupied by the New Mexico meadow jumping mouse. Additional consultations due to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied area. Project modifications to avoid adverse modification of unoccupied critical habitat (USFWS 2013c) which may affect recreation include:

1. Relocate the project to an area outside of jumping mouse critical habitat.

2. Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to unoccupied critical habitat.

3. Avoid ground disturbing activities or reduce project elements that would preclude the development of habitat patches containing dense herbaceous riparian vegetation.

4. Implement in-situ conservation (on-site conservation of this species) by restoration of dense herbaceous riparian vegetation to expand the remaining populations and improve the degraded status of the jumping mouse within a project's action area. Conservation measures would likely include protection of riparian areas through fencing, changing the timing or duration of the action (e.g., dormant season grazing), encouraging the reestablishment of beaver through habitat enhancement or active translocation, or ensuring that a constant supply of water is provided throughout the stream, ditch, or canal during the growing season.

7. Modify off-road vehicle management through fencing, signage, education, and timing of use.

Although there is no consultation history and project modifications are difficult to predict, it seems probable that project modifications may also include restricting or closing the unoccupied areas of critical habitat to dispersed camping or other off-trail uses that cause degradation or destruction of riparian vegetation.

Because project modifications designed to reestablish riparian vegetation will likely occur outside currently occupied areas in the unoccupied portions of critical habitat that are currently affected by recreation, critical habitat designation could have an impact on recreational activities above and beyond the impacts of ESA listing alone. The modifications attributable to critical habitat designation would occur over a small area in relation to the amount of recreational sites available, however. In summary, the impact to recreation is likely to be minor to moderate because the project modifications may limit where recreational projects or uses can occur within a small area of each National Forest.

ALTERNATIVE C

The effects of this alternative on recreation would be the same as for alternative B because recreation on the excluded tribal lands does not have a federal nexus and would not be subject to consultation in either alternative.

CULTURAL OR HISTORIC RESOURCES

EXISTING CONDITIONS

The Pueblos along the Middle Rio Grande use the waters of the Rio Grande to carry out their traditional religious and cultural ceremonies. Isleta Pueblo's water quality standards identify primary contact-ceremonial use as a designated use of the Rio Grande through the Pueblo. We are unaware of any other cultural or historic resources, including archeological sites or Indian sacred sites, in the proposed critical habitat.

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultations under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated.

Agencies likely to consult on projects designed to protect or educate the public about cultural or historic resources (e.g. interpretive centers or displays) if no critical habitat is designated include (USFWS 2013c):

- U.S. Forest Service (recreational use, and travel management plans).
- U.S. Fish and Wildlife Service (National Wildlife Refuge planning and projects).

See Alternative A under "water resources" above for project modifications that are likely to be proposed to avoid jeopardy to the species.

Project modifications and conservation measures to minimize project-related impacts would be implemented.

ALTERNATIVE B

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse or its critical habitat would require Section 7 consultation under the adverse modification standard as well as the jeopardy standard. The critical habitat provisions of section

7 consultation would apply to private, state, or tribal lands only when a federal action is involved, such as permitting, funding, or implementation. Agencies likely to consult are the same as those listed for Alternative A, above.

The number of consultations for cultural or historic resource preservation projects could be greater than in Alternative A because the majority of proposed critical habitat area is unoccupied and consultations for projects implemented on these unoccupied areas likely would not have occurred as a result of listing the species. These additional consultations would increase administrative effort for both the action agency and USFWS. However, all but four of the units are partially occupied by the New Mexico meadow jumping mouse. Additional consultations due to critical habitat designation would occur in these partially occupied units only if the proposed action would occur solely outside of the occupied area. Project modifications to avoid adverse modification of unoccupied critical habitat (USFWS 2013c) which may affect cultural resources include:

1. Relocate the project to an area outside of jumping mouse critical habitat.

2. Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to unoccupied critical habitat.

3. Avoid ground disturbing activities or reduce project elements that would preclude the development of habitat patches containing dense herbaceous riparian vegetation.

These project modifications are unlikely to affect cultural resource projects. Similar project modifications also would apply to many other types of projects (e.g. highway reconstruction, development, water management) and would serve to protect cultural resources from impacts caused by these other projects. Any ground-disturbing actions to protect critical habitat (e.g. exclosure fencing) would require cultural and archaeological surveys and be subject to separate cultural resource and NEPA analysis. Critical habitat designation is not expected to interfere with ceremonial uses of the river. Overall, designation of critical habitat is likely to have a minor positive effect on cultural resources.

ALTERNATIVE C

There would be no effect to cultural resources in these excluded areas. The effects of this alternative on cultural resource protection projects would be the same as for Alternative B except that section 7 consultations would not be necessary on the excluded tribal lands, which are all unoccupied and therefore not subject to section 7 consultation under the jeopardy standard.

SOCIOECONOMICS

Regulations for implementing NEPA require analysis of social effects when they are interrelated with effects on the physical or natural environment (40 CFR §1508.14). Economic effects have been analyzed in a separate economic analysis of the proposed designation of critical habitat for the New Mexico meadow jumping mouse (IEc 2014a). The following discussion relies heavily on that analysis.

EXISTING CONDITIONS

Educational services, health care, and social assistance organizations employ the largest percentage of people on the Isleta Pueblo and Ohkay Owingeh and the states of Arizona, Colorado, and New Mexico (Table 4; Table 5). Educational services, health care, and social assistance organizations also employ the largest percentage of people within ten of the twelve counties affected by the critical habitat designation (Table 4; Table 5). The exceptions are Archuleta County, Colorado, which has a similar percentage of people employed in retail, and Greenlee County, Arizona, where the largest percentage of people are employed in the category of “agriculture, forestry, fishing and hunting and mining.” This percentage is much higher than the other counties in the analysis area, and the state of Arizona as a whole.

Table 4. Employment by industry in counties in New Mexico proposed for critical habitat for New Mexico meadow jumping mouse (U.S. Bureau 2014a).

Industry	New Mexico	Bernalillo County	Colfax County	Mora County	Otero County	Rio Arriba County	Sandoval County	Socorro County
Civilian employed population 16 years and over	882,461	311,023	5,794	1,960	22,843	16,346	57,776	6,005
Agriculture, forestry, fishing and hunting, and mining	4.50%	1.00%	7.20%	9.80%	1.70%	2.70%	1.50%	4.10%
Construction	7.60%	7.30%	8.20%	14.70%	10.90%	9.00%	6.80%	6.20%
Manufacturing	5.10%	5.70%	3.90%	0.80%	2.80%	1.90%	9.90%	0.40%
Wholesale trade	2.10%	2.50%	0.20%	1.30%	1.30%	0.80%	2.30%	0.60%
Retail trade	11.30%	11.00%	13.30%	10.20%	11.50%	8.10%	12.50%	9.60%
Transportation and warehousing, and utilities	4.40%	3.70%	6.80%	3.80%	3.50%	5.30%	4.10%	4.60%
Information	1.70%	2.10%	0.80%	0.00%	1.40%	0.70%	1.90%	1.50%
Finance and insurance, and real estate and rental and leasing	4.70%	5.50%	6.20%	1.20%	3.90%	2.90%	5.80%	4.40%
Professional, scientific, and management, and	10.80%	13.80%	6.60%	5.40%	6.60%	14.50%	10.80%	10.30%

administrative and waste management services								
Educational services, and health care and social assistance	24.80%	25.10%	21.10%	45.50%	24.10%	22.80%	21.90%	39.40%
Arts, entertainment, and recreation, and accommodation and food services	10.60%	10.90%	14.00%	1.10%	11.00%	13.80%	10.30%	10.00%
Other services, except public administration	4.70%	4.90%	4.00%	1.40%	5.70%	3.80%	4.10%	3.00%
Public administration	7.70%	6.60%	7.60%	4.80%	15.60%	13.50%	8.20%	5.90%

Table 5. Employment by industry for counties in Arizona and Colorado with proposed critical habitat for New Mexico meadow jumping mouse (U.S. Census Bureau 2014a).

Industry	Arizona	Apache County, Arizona	Greenlee County, Arizona	Colorado	Archuleta County, Colorado	La Plata County, Colorado	Las Animas County, Colorado
Civilian\ employed population 16 years and over	2,733,537	18,947	3,381	2,498,972	5,444	27,400	6,706
Agriculture, forestry, fishing and hunting, and mining	1.40%	2.70%	48.40%	2.40%	7.50%	4.10%	13.00%
Construction	7.20%	11.10%	8.60%	7.90%	12.30%	11.40%	11.20%
Manufacturing	7.50%	2.00%	1.10%	7.20%	2.90%	3.90%	3.00%
Wholesale trade	2.50%	0.50%	0.90%	2.70%	0.40%	2.20%	1.00%
Retail trade	12.30%	8.00%	4.80%	11.30%	15.30%	11.90%	11.90%
Transportation and warehousing, and utilities	4.90%	6.90%	2.50%	4.70%	3.40%	3.70%	7.70%
Information	1.90%	0.70%	1.10%	3.10%	3.40%	1.80%	1.00%
Finance and insurance, and real estate and rental and leasing	8.00%	2.50%	0.80%	7.20%	6.40%	6.20%	4.70%
Professional, scientific, and management, and administrative and waste management services	11.40%	3.10%	4.10%	13.20%	9.80%	11.00%	4.00%

Educational services, and health care and social assistance	21.80%	37.10%	15.40%	20.00%	13.80%	19.20%	20.00%
Arts, entertainment, and recreation, and accommodation and food services	10.50%	9.90%	4.90%	10.40%	15.00%	14.10%	9.30%
Other services, except public administration	4.90%	3.20%	2.90%	5.10%	5.50%	5.00%	5.70%
Public administration	5.70%	12.40%	4.60%	5.00%	4.30%	5.60%	7.60%

Table 6. Employment by industry for Isleta Pueblo and Ohkay Owingeh (U.S. Census Bureau 2014a).

Industry	Isleta Pueblo	Ohkay Owingeh	New Mexico
Civilian employed population 16 years and over	1,560	2,608	882,461
Agriculture, forestry, fishing and hunting, and mining	3.70%	1.40%	4.50%
Construction	7.60%	12.50%	7.60%
Manufacturing	7.60%	2.10%	5.10%
Wholesale trade	0.40%	0.50%	2.10%
Retail trade	6.60%	10.80%	11.30%
Transportation and warehousing, and utilities	3.90%	3.60%	4.40%
Information	0.00%	0.80%	1.70%
Finance and insurance, and real estate and rental and leasing	1.00%	5.30%	4.70%
Professional, scientific, and management, and administrative and waste management services	7.10%	14.80%	10.80%
Educational services, and health care and social assistance	20.30%	17.90%	24.80%
Arts, entertainment, and recreation, and accommodation and food services	20.00%	14.10%	10.60%
Other services, except public administration	4.00%	4.40%	4.70%
Public administration	17.90%	11.80%	7.70%

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

Under this alternative, federally supported actions that may affect the New Mexico meadow jumping mouse would require Section 7 consultation under the jeopardy standard in all areas occupied by the species. Analysis under the adverse modification standard would not be required because no critical habitat would be designated. Costs of consultation and conservation measures would be attributable to baseline.

ALTERNATIVE B

When determining proposed critical habitat boundaries, USFWS made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands lack physical or biological features for the New Mexico meadow jumping mouse (78 FR 37328). Therefore, no communities exist within the proposed critical habitat units and no residences or businesses would be displaced. Designation of critical habitat would not affect community services or community cohesion within any of the counties or tribal communities. Community resources such as schools, law enforcement, medical services, and social services, would not change as a result of designation of critical habitat.

As described in topics analyzed above, designation of critical habitat for the New Mexico meadow jumping mouse would not impact fish, wildlife, and vegetation; floodplains and wetlands; agriculture; fire management; energy resources; or cultural or historic resources. Minimal impacts could occur, but have not been identified for development, and highway construction and reconstruction. Designation of critical habitat for the New Mexico meadow jumping mouse could have minor to moderate impacts on livestock grazing, water resources and management, and recreation. Industries most likely to be financially impacted include livestock grazing. Costs to construction are possible, but unlikely. Construction employs up to 14.7 percent of civilians in the twelve counties and two sovereign nations (Tables 4-6). No construction projects with a federal nexus have been identified, and no economic costs to development have been identified in the economic analysis. Agriculture, forestry, fishing and hunting, and mining (which include livestock grazing) employ less than five percent on the two sovereign nations and the three states (Tables 4-6). Agriculture, forestry, fishing and hunting, and mining also employ less than five percent of civilians in all counties except Mora, Colfax, Greenlee, and Archuleta (Tables 4-6). Greenlee County, Arizona, is unusual in having 48.4% of its population employed in this industry.

Livestock grazing

Within unoccupied habitat, the economic analysis estimates reductions in AUMs using maximum thresholds (IEc 2014a). This analysis estimates a maximum annual reduction of approximately 73 AUMs on three USFS allotments (IEc 2014a). Therefore only three small entities are likely to be affected. The economic analysis also assumed all critical habitat would be fenced, and assumed a high-end linear cost of pipe fencing of $20 per foot, based on information provided by the USFS. Fencing costs for occupied portions of critical habitat are attributed to the baseline, while fencing costs for unoccupied portions are considered to be incremental. Total incremental costs associated with livestock grazing over 20 years are $14,000,000 or $720,000 on an annualized basis using a seven percent discount rate (IEc 2014a).

Table 7. Incremental costs associated with grazing activities (2013$, seven percent discount rate; IEc 2014a).

UNIT	NAME	20-YEAR IMPACTS (2014-2033)	
		PRESENT VALUE	ANNUALIZED
1	Sugarite Canyon	$0	$0
2	Coyote Creek	$0	$0
3A	San Antonio Creek	$1,300,000	$65,000
3B	Rio Cebolla	$1,800,000	$88,000
3C	Rio de las Vacas	$3,100,000	$160,000
4A	Silver Springs	$0	$0
4B	Upper Rio Penasco	$630,000	$31,000
4C	Middle Rio Penasco	$390,000	$19,000
4D	Wills Canyon	$500,000	$25,000
4E	Agua Chiquita Canyon	$690,000	$34,000
5A	Little Colorado River	$1,200,000	$60,000
5B	Nutrioso River	$1,900,000	$95,000
5C	San Francisco River	$110,000	$5,500

UNIT	NAME	20-YEAR IMPACTS (2014-2033)	
		PRESENT VALUE	ANNUALIZED
5D	East Fork Black River	$780,000	$39,000
5E	West Fork Black River	$770,000	$39,000
5F	Boggy and Centerfire Creeks	$790,000	$39,000
5G	Corduroy Creek	$280,000	$14,000
5H	Campbell Blue Creek	$210,000	$11,000
6A	Isleta Marsh	$0	$0
6B	Ohkay Owingeh	$0	$0
6C	Bosque del Apache NWR	$0	$0
7	Florida River	$0	$0
8	Sambrito Creek	$0	$0
TOTAL		**$14,000,000**	**$720,000**

Notes: The level of effort per consultation represents approximate averages based on the best available cost information. The cost estimates in this report are accordingly rounded to two significant digits to reflect this imprecision. The unit cost estimates therefore may not sum to the total costs reported due to rounding.

An analysis of the costs of perceptional effects was conducted (IEc 2014b). This analysis states:

Despite the fact that a section 7 nexus is unlikely for grazing activities conducted on private acres, the ranching community may perceive that the designation of certain parcels as critical habitat will limit future grazing activities in those areas. In addition, private landowners hold renewable leases that are both inheritable and transferrable with the sale of the land, or in the case of USFS permits, the transfer of livestock (pending the approval of the USFS). Thus, impacts to grazing on Federal acres may affect the value of connected private holdings.

To evaluate the possible magnitude of such costs, we conduct a bounding analysis. Our analysis estimates the total perpetuity value of the cattle that could be supported by all privately-owned land and associated Federal leases in the proposed critical habitat designation (i.e., AUMs). Public perception may diminish land values by some percent of these total values. Data limitations prevent us from estimating the size of this percent reduction or its attenuation rate.

To estimate the maximum costs due to perceptional effects, the economic analysis used a four step process (IEc 2014b):

Step 1 - Identify the amount of privately-owned land within the designation = 4,140 acres

Step 2 – Estimate Total AUMs that these lands could support by multiplying the average number of AUMs per acre in the Forest Service allotments by 17, based on the assumption that private lands are more productive than lands leased from the Forest Service**.** = 4,122 AUMs.

Step 3 – Estimate the value in perpetuity of these AUMs by applying *state-specific, private, non-irrigated grazing fee rates for cattle.* **=** $740,000.

Step 4 – Estimate the value of Federal allotments associated with privately-owned Properties = $24,000. This value represents an upper bound estimate of the decrease in the value of private properties associated with Federal grazing leases.

Based on the analysis presented in this perceptional effects memorandum, the value of grazing activities is unlikely to exceed $100 million (IEc 2014b).

Transportation

No federal or state highway projects in proposed critical habitat are anticipated. The Forest Service anticipates a paving project on FR 249, which is located partially within Unit 5D (East Fork Black River). The only incremental costs associated with this project would be additional administrative effort required to consider critical habitat in informal consultation (IEc 2014a).

Recreation

The economic analysis indicates that approximately 40 miles of fencing will be necessary to address the threat of dispersed recreation on Forest Service lands. They assumed a high-end fencing cost of $20 per foot, resulting in total costs of approximately $4.2 million (IEc 2014a).

Water use and management

The following projects are expected to require section 7 consultation: (1) the Bernalillo to Belen Levees; and (2) the rehabilitation of Lake Dorothy and Lake Alice; (3) the operations of the Lemon Dam; and (4) re-initiation of a programmatic consultation for water use and management activities on the Middle Rio Grande (IEc 2014a) . The Bernalillo to Belen Levees project will occur in Subunit 6A, which is unoccupied by the species. Therefore, incremental costs of critical habitat designation for this project include both the costs of consultation and the costs of any conservation measures recommended by the Service (IEc 2014a). The rehabilitation of Lake Dorothy and Lake Alice is associated with a wildfire that occurred in 2011 in Unit 1. Because Unit 1 is partially occupied by the species, incremental costs are likely limited to the additional administrative costs of considering critical habitat as part of the informal consultations (IEc 2014a). Lemon Dam is in Unit 7. Because Unit 7 is partially occupied by the species, it is unlikely that critical habitat would generate additional requests for conservation efforts beyond what would be required due to the listing of the species. Therefore, incremental costs to this project are likely limited to the additional administrative costs associated with addressing adverse modification in the consultation (IEc 2014a). Re-initiation of programmatic consultation for water use and management activities on the Middle Rio Grande will likely occur regardless of critical habitat designation due to the presence of the mouse in Subunit 6C. Project modifications recommended by the Service during section 7 consultation on water use and management activities in the Middle Rio Grande would be recommended due to the presence of the species in Subunit 6C regardless of critical habitat designation. It is unlikely that critical habitat would generate additional requests for conservation efforts beyond what would be required due to the presence of the species. Incremental costs in Subunits 6A and 6C will therefore likely be limited to the administrative costs of consultation (IEc 2014a).

Species and Habitat Management

A proposed habitat restoration project (“Espanola Valley General Investigations”) that includes the historic site at Ohkay Owingeh (Subunit 6B), is expected to benefit New Mexico meadow jumping mouse habitat, and therefore would only incur costs of consultation (IEc 2014a).

Table 8. Incremental costs associated with non-grazing activities (2013$ using seven percent discount rate; IEc 2014a).

Unit	Name	20-Year Impacts (2014-2033)	
		Present Value	Annualized
1	Sugarite Canyon	$5,900	$520
2	Coyote Creek	$0	$0
3A	San Antonio Creek	$5,600	$500
3B	Rio Cebolla	$5,600	$500
3C	Rio de las Vacas	$5,600	$500
4A	Silver Springs	$3,400	$300
4B	Upper Rio Penasco	$780,000	$68,000
4C	Middle Rio Penasco	$3,400	$300
4D	Wills Canyon	$3,400	$300
4E	Agua Chiquita Canyon	$3,400	$300
5A	Little Colorado River	$1,500,000	$130,000
5B	Nutrioso River	$2,100	$190
5C	San Francisco River	$2,100	$190

Unit	Name	20-Year Impacts (2014-2033)	
		Present Value	Annualized
5D	East Fork Black River	$4,400	$380
5E	West Fork Black River	$1,700,000	$150,000
5F	Boggy and Centerfire Creeks	$2,100	$190
5G	Corduroy Creek	$2,100	$190
5H	Campbell Blue Creek	$2,100	$190
6A	Isleta Marsh	$31,000	$2,700
6B	Ohkay Owingeh	$6,800	$600
6C	Bosque del Apache NWR	$8,400	$740
7	Florida River	$4,700	$410
8	Sambrito Creek	$0	$0
TOTAL		**$4,100,000**	$360,000

Notes: The level of effort per consultation represents approximate averages based on the best available cost information. The cost estimates in this report are accordingly rounded to two significant digits to reflect this imprecision. The unit cost estimates therefore may not sum to the total costs reported due to rounding.

ALTERNATIVE C

The effects of implementing this alternative would be the same as for Alternative B except that the incremental costs of consultation for the projects on the Ohkay Owingeh and Isleta Pueblo would not occur because these areas would be excluded from critical habitat designations. No projects have been anticipated in these areas, except the proposed habitat restoration project at Ohkay Owingeh discussed above.

ENVIRONMENTAL JUSTICE

Federal agencies are required to "*identify and address disproportionately high and adverse human health or environmental effects*" of their programs and actions on minority populations and low-income populations, as directed by Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations).

EXISTING CONDITIONS

As described in the methodology section, the analysis area for this EA includes 12 counties in three states including: Bernalillo, Colfax, Mora, Otero, Rio Arriba, Sandoval, and Socorro Counties in New Mexico; Las Animas, Archuleta, and La Plata Counties in Colorado; and Greenlee and Apache Counties in Arizona. It also includes two sovereign nations: the Ohkay Owingeh and Isleta Pueblo.

Apache County, Arizona has a high percentage of Native Americans (72.8%; Table 9). Most of this Native American population is Navajo, and likely live within the Navajo Reservation, which is outside the designated critical habitat units. In Colorado, La Plata has a higher percentage of Native Americans than the statewide average, although it is still low at 6% of the population (Table 9). In New Mexico, all counties proposed for critical habitat have a lower percentage of Native Americans than the statewide average of 9.2%, except Rio Arriba County (14.7%), Sandoval County (12.7%), and Socorro County (11.1 %) have slightly higher percentages (Table 10). The proposed critical habitat includes 103 ha (255 acres) on the Ohkay Owingeh and 80 ha (197 acres) on Isleta Pueblo. Over 91 percent of the people in the Isleta Pueblo are Native American, and 19 percent of the people in the Ohkay Owingeh are Native American. These lands clearly have a disproportionate minority population in comparison to the rest of New Mexico (9.2 percent; Table 11).

Hispanics and Latinos represent a larger percentage of the population than statewide averages in Greenlee County, Arizona and Las Animas County, Colorado. In addition, all of New Mexico has a large Hispanic or Latino population (46.3%), but the proportion is even higher in Mora County (80.2%) and Rio Arriba County (71.4%; Table 10). The Ohkay Owingeh also has a high percentage of Hispanics or Latinos (74.8%: Table 11).

Low income populations, as reflected in the number of people and families below the poverty level, are higher in Ohkay Owingeh in comparison to New Mexico statewide (Table 12). Isleta Pueblo has a higher percentage of families below the poverty level, but a slightly lower number of individuals below the poverty level than New Mexico statewide (Table 12). Apache County, Arizona; Las Animas County, Colorado; and Socorro County, New Mexico also have higher poverty rates than their respective states (Table 12).

Table 9. Race and ethnicity of populations within counties of Arizona and Colorado proposed for critical habitat for New Mexico meadow jumping mouse (U.S. Census Bureau 2014b).

Subject	Arizona	Apache County, Arizona	Greenlee County, Arizona	Colorado	Archuleta County, Colorado	La Plata County, Colorado	Las Animas County, Colorado
Total population	6,410,979	71,618	8,592	5,042,853	12,109	51,443	15,385
RACE							
White	79.30%	24.00%	86.20%	84.20%	89.40%	87.40%	85.80%
Black or African American	4.10%	0.30%	1.00%	4.00%	0.50%	0.50%	1.10%
American Indian and Alaska Native	4.40%	72.80%	2.10%	1.00%	0.70%	6.30%	2.10%
Cherokee tribal grouping	0.00%	0.20%	0.00%	0.10%	0.20%	0.10%	0.20%
Chippewa tribal grouping	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.00%
Navajo tribal grouping	2.20%	70.00%	1.00%	0.10%	0.00%	2.20%	0.60%
Sioux tribal grouping	0.00%	0.00%	0.00%	0.10%	0.00%	0.10%	0.00%
Asian	2.80%	0.40%	0.60%	2.70%	1.00%	0.70%	0.50%
Native Hawaiian and Other Pacific Islander	0.20%	0.10%	0.00%	0.10%	0.10%	0.10%	0.20%

Some other race	6.40%	1.00%	7.30%	4.70%	3.80%	3.00%	6.70%
HISPANIC OR LATINO AND RACE							
Hispanic or Latino (of any race)	29.70%	6.00%	47.50%	20.60%	17.80%	11.90%	42.00%

Table 10. Race and ethnicity of populations within counties in New Mexico proposed for critical habitat for New Mexico meadow jumping mouse (U.S. Census Bureau 2014b).

Subject	New Mexico	Bernalillo County	Colfax County	Mora County	Otero County	Rio Arriba County	Sandoval County	Socorro County
Total population	2,055,287	661,924	13,614	4,830	64,176	40,201	131,302	17,843
RACE								
White	72.60%	69.80%	80.70%	76.00%	79.00%	71.70%	72.40%	79.30%
Black or African American	2.00%	2.80%	0.60%	0.00%	3.90%	0.40%	3.00%	1.10%
American Indian and Alaska Native	9.20%	4.60%	3.50%	2.40%	6.90%	14.70%	12.70%	11.10%
Cherokee tribal grouping	0.10%	0.00%	0.50%	0.00%	0.10%	0.00%	0.00%	0.00%
Chippewa tribal grouping	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%
Navajo tribal grouping	5.50%	2.20%	1.70%	1.20%	0.50%	1.10%	2.60%	7.40%
Sioux tribal grouping	0.00%	0.10%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%

Asian	1.30%	2.30%	0.40%	0.00%	1.40%	0.40%	1.30%	1.00%
Native Hawaiian and Other Pacific Islander	0.10%	0.10%	0.00%	0.00%	0.10%	0.00%	0.10%	0.10%
Some other race	11.70%	16.60%	11.90%	19.90%	5.70%	11.30%	7.60%	5.70%
HISPANIC OR LATINO AND RACE								
Hispanic or Latino (of any race)	46.30%	47.80%	47.50%	80.20%	34.70%	71.40%	35.30%	48.50%

Table 11. Race and ethnicity of populations on Isleta Pueblo and Ohkay Owingeh and New Mexico (U.S. Census Bureau 2014b).

Subject	Isleta Pueblo	Ohkay Owingeh	New Mexico
Total population	3,551	6,646	2,055,287
RACE			
White	4.10%	68.30%	72.60%
Black or African American	0.00%	0.30%	2.00%
American Indian and Alaska Native	91.40%	19.60%	9.20%
Cherokee tribal grouping	0.00%	0.20%	0.10%
Chippewa tribal grouping	0.00%	0.00%	0.00%
Navajo tribal grouping	2.40%	0.60%	5.50%
Sioux tribal grouping	0.00%	0.00%	0.00%
Asian	1.80%	0.00%	1.30%
Native Hawaiian and Other Pacific Islander	0.00%	0.00%	0.10%
Some other race	2.00%	10.70%	11.70%
HISPANIC OR LATINO AND RACE			
Hispanic or Latino (of any race)	11.70%	74.80%	46.30%

Table 12. Families and people living at or below poverty level in counties, states, and nations proposed for critical habitat for New Mexico meadow jumping mouse (U.S. Census Bureau 2014a).

Location		Percentage Below Poverty Level	
	Population 16 years and over	All families	All people
Arizona	4,967,615	12.40%	17.20%
Apache County	52,010	27.70%	34.00%
Greenlee County	6,346	13.20%	17.50%
Colorado	3,955,983	8.90%	12.90%
Archuleta County	10,019	7.40%	8.80%
La Plata County	42,284	5.70%	11.10%
Las Animas County	12,631	13.30%	18.60%
New Mexico	1,597,923	14.90%	19.50%
Bernalillo County	521,415	13.40%	17.30%
Colfax County	11,257	12.30%	17.60%
Mora County	3,928	11.00%	16.20%
Otero County	50,129	15.40%	20.70%
Rio Arriba County	31,425	14.80%	19.30%
Sandoval County	100,591	9.90%	13.20%
Socorro County	13,890	17.60%	25.00%
Isleta Pueblo	2,796	19.50%	19.00%
Ohkay Owingeh	5,161	17.10%	22.40%

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A

No environmental justice affects would occur because no action would occur under this alternative.

ALTERNATIVE B

Because some of the proposed critical habitat is on a sovereign nation with a population that is 91% Native American, and one county with a population that is 73% Native American, any negative impacts from designation of critical habitat for the New Mexico meadow jumping mouse could have a disproportionately high effect on minority (Native American) populations in some portions of the analysis area. Negative impacts could also have a disproportionally high effect on other minority (Hispanic or Latino) and low-income populations in several counties. Negative impacts on human health or the natural environment are not anticipated; however, so the only possible negative impacts would be economic impacts to the human environment.

Economic costs, distributed across all parties, would be less than $100 million in any one year (IEc 2014a). Costs associated with designation of critical habitat for the New Mexico meadow jumping mouse are not likely to have a significant impact on low-income or minority populations because: 1) total costs are less than $100 million in any one year (and are estimated to be $19 million over 20 years), and 2) costs would be distributed among multiple agencies and private parties. Therefore, significant disproportionately high and adverse impacts to minority or low-income populations are unlikely.

ALTERNATIVE C

This alternative would exclude all tribal lands from critical habitat designation and therefore eliminate economic impacts to tribal governments. Some of the counties, however, have high poverty rates and high proportions of Hispanics or Latinos. Therefore, potential for a disproportionately high impact on low-income and minority populations still exists. As with alternative B, however, Negative impacts on human health or the natural environment are not anticipated, so the only possible negative impacts would be economic impacts to the human environment. Economic impacts are likely to be less than $100 million in any one year (IEc 2014a). Costs associated with designation of critical habitat for the New Mexico meadow jumping mouse are not likely to have a significant impact on low-income or minority populations because: 1) total costs are less than $100 million in any one year (and are estimated to be $19

million over 20 years), and 2) costs would be distributed among multiple agencies and private parties. Therefore, significant disproportionately high and adverse impacts to minority or low-income populations are unlikely.

CUMULATIVE EFFECTS

The Council on Environmental Quality defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR ~ 1508.7)." The past, present, and reasonably foreseeable future actions in the proposed critical habitat area which could contribute to cumulative effects include:

- Effects of listing, critical habitat designation, and section 7 consultations for other species and other designated critical habitats; and
- Existing land management policies and plans.

Cumulative effects would not occur to those resources for which we have determined that critical habitat designation will not impact. We therefore have limited cumulative effects analysis to those resources which may have impacts by the designation of critical habitat. These include livestock grazing, water use and resources, and recreation.

The counties containing proposed critical habitat support 49 species that are protected under the ESA (Table 4). Cumulative effects from the listing and section 7 consultations for these species could occur. Three of these species (Southwestern willow flycatcher, Chiricahua leopard frog, and Pecos sunflower) could occur in the proposed critical habitat units because the units are within the range of the species and contain suitable habitat. In addition, critical habitat for five ESA-listed species occurs within the area proposed for critical habitat for the New Mexico meadow jumping mouse including: 1) Mexican spotted owl (Units 3,4,5); 2) Southwestern willow flycatcher (Units 2 and 6); 3) loach minnow (Unit 5); 4) spikedace (Unit 5); and 5) Rio Grande silvery minnow (Unit 6). Existing Forest plans and policies may also result in effects to livestock grazing and recreation, although those effects have not been quantified.

LIVESTOCK GRAZING:

As described in the Livestock Grazing and Socioeconomics sections above, the project modifications necessary to avoid adverse modification to New Mexico meadow jumping mouse critical habitat that could impact livestock grazing include fencing, reconfiguration of grazing units, adjustment of AUMs, adjustment of timing of grazing, and/or off-site water developments. The impacts to livestock grazing would be primarily due to increased costs resulting from implementing these project modifications. Total incremental costs associated with livestock grazing over 20 years are $14,000,000 or $720,000 on an annualized basis using a seven percent

discount rate (IEc 2014a). These costs include agency costs for consultation as well as costs to private livestock grazers. For three livestock grazing allotments, the economic analysis assumes that AUM reductions due to mouse conservation are proportional to the percentage of allotment area proposed for critical habitat designation: five, seven, and 12 percent (IEc 2014). Within occupied habitat, the analysis estimates an annual reduction of approximately eight AUMs on USFS allotments. The designation of critical habitat would add further reductions of approximately 73 AUMs within unoccupied habitat (IEc2014).

Project modifications to prevent jeopardy to other listed species or adverse modification to their critical habitat could also include fencing, adjusting the timing of grazing, reconfiguration of grazing units, or off-site water developments. Additional project modifications to avoid jeopardy to Southwestern willow flycatcher, loach minnow, spikedace, Chiricahua leopard frog, Rio Grande silvery minnow and Pecos sunflower or adverse impacts to their critical habitat could also impact livestock grazing. These modifications would be project specific and it is difficult to predict future impacts.

The Service is aware of the concerns from private ranchers about the cumulative impact of this critical habitat designation on ranching activities. However, on private land, designation of critical habitat does not limit livestock grazing, except where a federal license, permit, or funding may be sought or required. On federal land, past consultations for other species may have resulted in project modifications, but these have not eliminated or fundamentally changed livestock grazing. This critical habitat designation for the New Mexico meadow jumping mouse would contribute only minor cumulative impacts to these past, present, and foreseeable impacts given the small number and limited costs of expected project modifications.

WATER RESOURCES AND MANAGEMENT:

Unoccupied and occupied areas of each partially occupied unit are located along the same watercourses, so water diversions or other actions reducing stream flows in the unoccupied areas also are likely to affect the occupied areas. Therefore, project modifications to retain adequate flows in the partially occupied critical habitat units would already be necessary to avoid jeopardy to the species. In contrast, canal maintenance activities, such as mowing and dredging, would require modification in unoccupied sections of the critical habitat to allow for the development of PCEs. These modifications would be due to critical habitat designation. Each consultation will be evaluated on a case-by-case basis (50 CFR part402).

The four unoccupied units include Rio de las Vacas, Upper Rio Peñasco, Ohkay Owingeh, and Isleta Pueblo. Section 7 consultations for these areas would be due to critical habitat designation

and may require projects to maintain flows in these stream stretches to avoid adverse modification or destruction of critical habitat and to allow for development of riparian vegetation as described in the PCEs. Additional costs due to critical habitat designation would be due to maintaining flows in these four unoccupied units and increased complexity of consultations to incorporate analysis of effects to critical habitat in the partially occupied units. Total incremental costs associated with water use and resources over 20 years are less than $4.1 million, the total of costs of all non-grazing activities (IEc 2014a). Project modifications to avoid jeopardy to Southwestern willow flycatcher, loach minnow, spikedace, Chiricahua leopard frog, Rio Grande silvery minnow and Pecos sunflower or adverse impacts to their critical habitat could also impact water management. These modifications would be project specific and it is difficult to predict future impacts. This critical habitat designation for the New Mexico meadow jumping mouse would contribute only minor cumulative impacts to these past, present, and foreseeable impacts given the small number and limited costs of expected project modifications.

RECREATION:

As described in the Recreation and Socioeconomics sections above, the project modifications to avoid adverse modification of New Mexico meadow jumping mouse critical habitat could include restricting or closing the unoccupied areas of critical habitat to dispersed camping or other off-trail uses that cause degradation or destruction of riparian vegetation. The impacts to recreation would be primarily due to increased costs resulting from implementing project modifications such as fencing. These incremental costs associated with recreation over 20 years would be less than $4 million, the total of costs of all non-grazing activities (IEc 2014a). Project modifications to avoid jeopardy to Mexican spotted owl, Southwestern willow flycatcher, loach minnow, spikedace, Chiricahua leopard frog, Rio Grande silvery minnow and Pecos sunflower or adverse impacts to their critical habitat could also impact recreation. These modifications would be project specific and it is difficult to predict future impacts. This critical habitat designation for the New Mexico meadow jumping mouse would contribute only minor cumulative impacts to these past, present, and foreseeable impacts given the small number and limited costs of expected project modifications.

SUMMARY OF CUMULATIVE EFFECTS

Effects of proposed critical habitat designation for the New Mexico meadow jumping mouse on most resource areas generally consist primarily of the potential for minor increases in administrative effort for section 7 consultations to incorporate critical habitat considerations and

addition of project modifications to reduce impacts to primary constituent elements. These potential project modifications would primarily affect project costs. The total estimated costs are not likely to exceed $19 million (IEc 2014a). Therefore, they would not result in substantial cumulative effects when added to the effects of section 7 consultations for other species and land management plans and policies.

RELATIONSHIP BETWEEN SHORT-TERM AND LONG-TERM PRODUCTIVITY

Proposed designation of critical habitat is a programmatic policy that would have no effect on short-term or long-term productivity.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible commitments of resources are those effects that cannot be reversed. For example, the extinction of a species is an irreversible commitment. Irretrievable commitments of resources are those that are lost for a period of time, but may be reversed, such as building a shopping center on farmland. The land cannot be used for farming again until the pavement is removed and soils are restored to productivity. Designation of critical habitat for New Mexico meadow jumping mouse would result neither in irreversible or irretrievable commitments of resources.

CHAPTER 4: COUNCIL ON ENVIRONMENTAL QUALITY ANALYSIS OF SIGNIFICANCE

The primary purpose of preparing an environmental assessment under NEPA is to determine whether a proposed action would have significant impacts on the human environment. If significant impacts may result from a proposed action, then an environmental impact statement is required (40 CFR §1502.3). Whether a proposed action exceeds a threshold of significance is determined by analyzing the context and the intensity of the proposed action (40 CFR §1508.27). Context refers to the setting of the proposed action and potential impacts of that action. The context of a significance determination may be society as a whole (human, national), the affected region, the affected interests, or the locality. Intensity refers to the severity of the impacts.

The context of short and long-term impacts of the proposed designation of critical habitat for the New Mexico meadow jumping mouse includes portions of Bernalillo, Colfax, Mora, Otero, Rio Arriba, Sandoval, and Socorro Counties, in New Mexico; Las Animas, Archuleta, and La Plata Counties, Colorado; and Greenlee and Apache Counties, Arizona. Under regulations of the CEQ, which is responsible for ensuring compliance with NEPA, intensity is determined by considering 10 criteria (CFR 40 §1508.27[b]): (1) beneficial and adverse impacts; (2) the degree of impacts on health and safety; (3) impacts on the unique characteristics of the area; (4) the degree to which the impacts would likely be highly controversial; (5) the degree to which the proposed action would impose unique, unknown, or uncertain risks; (6) the degree to which the proposed action might establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration; (7) whether the proposed action is related to other actions, which cumulatively could produce significant impacts; (8) the degree to which the proposed action might adversely affect locales, objects, or structures eligible for listing in the National Register of Historic Places; (9) the degree to which the proposed action might adversely affect an endangered or threatened species or its habitat, as determined to be critical under the ESA; and (10) whether the proposed action threatens a violation of federal, state, or local law. We consider each of these ten points below:

1. Potential impacts on environmental resources, both beneficial and adverse, would be minor. Impacts of critical habitat designation on natural resources within the areas proposed as New Mexico meadow jumping mouse critical habitat were analyzed and discussed in Chapter 3. Applying the analysis of impacts to the significance criteria identified above, the USFWS concludes that the adverse impacts of critical habitat designation would not be significant.

2. There would be no impacts on public health or safety from the proposed designation of critical habitat and no impacts on unique characteristics of the geographic area. No significant impacts on fire management activities or flood control would occur.

3. Impacts to the unique characteristics of the area would be negligible. Wild and Scenic Rivers or Wilderness Areas, near the critical habitat units would not be affected. No Areas of Critical Environmental Concern are found near the proposed units. We have analyzed potential impacts on unique cultural and historic resources in the area and found no impacts.

4. The impacts will not be highly controversial because the area affected is small and few people are involved.

5. The impacts do not pose any uncertain, unique, or unknown risks. New activities with a federal nexus would result in Section 7 consultations.

6. The designation of critical habitat by the USFWS for the conservation of endangered species is not a precedent-setting action with significant effects. The agency has designated critical habitat for numerous other species.

7. The proposed action is not related to other actions which cumulatively could produce significant impacts. There would not be significant cumulative impacts because the cumulative impacts would be limited to Section 7 consultation outcomes.

8. Critical habitat designation is not likely to affect sites, objects, or structures of historical, scientific, or cultural significance. The proposed designation would not result in any ground-disturbing activities that have the potential to affect archeological or other cultural resources. Potential conservation measures or project modifications to protect critical habitat PCEs would not modify or pose risk of harm to any historic properties listed in or eligible for the National Register of Historic Places.

9. Critical habitat designation would not adversely affect an endangered or threatened species or its habitat. Designation will have long-term, beneficial, conservation-related impacts on the New Mexico meadow jumping mouse survival and recovery through maintenance of PCEs.

10. Proposed critical habitat designation would not violate any federal, state, or local laws. The designation of critical habitat is required by law in order to comply with the ESA.

CHAPTER 5: COORDINATION WITH THE PUBLIC

The proposed rule for listing the New Mexico meadow jumping mouse as an endangered species and designating critical habitat was published in the Federal Register on June 20, 2013. Public comments were solicited in the Federal Register notice. Comments were accepted until August 19, 2013. Thirty-five comments were received during this period and issues identified by comments were included in Chapter 1. This Draft EA will be available for public review for 30 days and comments received will be incorporated into the final EA.

Ohkay Owingeh and Isleta Pueblo contain segments of the Rio Grande in Rio Arriba and Bernalillo Counties, New Mexico, respectively, which are essential to the conservation of the New Mexico meadow jumping mouse. These river segments occur within the proposed Rio Grande Critical Habitat Unit. USFWS sent notification letters in November 2011 to both Tribes describing the listing process. We have also engaged in conversations with both Tribes about proposed critical habitat to the extent possible without disclosing predecisional information. At their invitation, on August 14, 2013, we attended a coordination meeting with the Isleta Pueblo to discuss proposed critical habitat, and they provided additional information regarding their land management practices and the potential for developing an endangered species management plan. Since the meeting, Isleta Pueblo indicated that they intend to amend their Rio Grande silvery minnow and Southwestern willow flycatcher riverine management plan, which will address and contribute to the conservation of the New Mexico meadow jumping mouse. On February 19, 2014, we attended a coordination meeting with Ohkay Owingeh to discuss proposed critical habitat. We also discussed their intention to use their Riparian and Bosque habitat restoration and management plan to maintain dense wetland vegetation and moist soil conditions to provide suitable habitat for the conservation of the New Mexico meadow jumping mouse.

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