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Memorandum

TO: Industrial Economics Incorporated

FROM: *E. W. H.*
to Field Supervisor, New Mexico Ecological Services Field Office, Albuquerque,
New Mexico

SUBJECT: Incremental Effects Memorandum for the Economic Analysis for the Proposed
Rule to Designate Critical Habitat for the New Mexico meadow jumping mouse

The purpose of this memorandum is to provide information to serve as a basis for conducting an economic analysis of the proposed critical habitat designation for the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*). This information will fulfill the request as identified in the November 30, 2010, Memorandum, *Guidance for Preparing Incremental Effects Memo* (from Jennifer Baxter, Industrial Economics, Inc., to Douglas Krofta, U.S. Fish and Wildlife Service (Service)).

Section 4(b)(2) of the Endangered Species Act (Act) requires the U.S. Fish and Wildlife Service (Service) to consider the economic, national security, and other impacts of designating critical habitat. The Service may exclude an area from critical habitat if it determines that the benefits of exclusion outweigh the benefits of including the area as critical habitat, unless the exclusion will result in the extinction of the species. To support its weighing of the benefits of excluding versus including an area as critical habitat, the Service prepares an economic analysis for each proposed critical habitat rule describing and monetizing, where possible, the economic impacts (costs and benefits) of the proposed regulation.

Most courts have held that the Service only needs to consider the incremental impacts imposed by the critical habitat designation over and above those impacts imposed as a result of listing the species. For example, the Ninth Circuit Court of Appeals reached this conclusion twice within the last few years, and the U.S. Supreme Court declined to hear any further appeal from those rulings (*Arizona Cattle Growers' Assoc. v. Salazar*, 606 F.3d 116, (9th Cir. June 4, 2010) cert. denied, 179 L. Ed. 2d 300, 2011 U.S. LEXIS 1362, 79 U.S.L.W. 3475 (2011); *Home Builders Association of Northern California v. United States Fish & Wildlife Service*, 616 F. 3rd 983 (9th Cir. 2010) cert. denied, 179 L. Ed. 2d 300, 2011 U.S. LEXIS 1362, 79 U.S.L.W. 3475 (2011)).

However, prevailing court decisions in the Tenth Circuit Court of Appeals do not allow the incremental analysis approach. Instead, the Tenth Circuit requires that the Service consider both the baseline economic impacts imposed due to listing the species and the additional incremental economic impacts imposed by designating critical habitat (*New Mexico Cattle Growers Ass'n v. FWS*, 248 F.3d 1277 (10th Cir. May 11, 2001)). As a consequence, an economic analysis for critical habitat that is being designated within States that fall within the jurisdiction of the Tenth Circuit should include a coextensive cost evaluation which addresses, and quantifies to the extent feasible, all of the conservation-related impacts associated with the regulatory baseline (those resulting under the jeopardy standard under section 7 of the Act, and under sections 9 and 10 of the Act). In other words, the allocation of impacts should show those that are part of the regulatory baseline and those that are unique to the critical habitat designation.

There are a number of ways that designation of critical habitat could influence activities, but one of the important functions of this memorandum is to provide detailed information about the differences between actions required to avoid jeopardy, versus actions that may be required to avoid adverse modification. The Service is working to update the regulatory definition of adverse modification since it was invalidated by a prior court ruling. In the meantime, we will rely on guidance provided by the Director's December 9, 2004, Memorandum, *Application of the "Destruction or Adverse Modification" Standard under Section 7 (a)(2) of the Endangered Species Act*. This memo explains that the conclusion for a section 7 analysis of a Federal action is to determine if the "critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve the intended conservation role of the species ... " (p. 3). The information provided below is intended to identify the possible incremental effects of critical habitat designation for the jumping mouse under the different section 7 standards.

Background

The New Mexico meadow jumping mouse (hereafter referred to as "jumping mouse") is being proposed for listing under the Act concurrently with the proposed designation of critical habitat.

We are proposing to designate approximately 310.5 kilometers (km) (193.1 miles (mi); 5,892 hectare (ha), 14,560 acres (ac)) of critical habitat within 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. The proposed designation comprises eight units including: (1) Sugarite Canyon; (2) Coyote Creek; (3) Jemez Mountains; (4) Sacramento Mountains; (5) White Mountains; (6) middle Rio Grande; (7) Florida River; and (8) Sambrito Creek. We are proposing linear segments along rivers and streams, springs and wetlands, or canals and ditches to account for the species' natural history and habitat use. Land ownership within proposed critical habitat for the jumping mouse in acres is broken down as follows: Federal (55%), State (Arizona, Colorado, and New Mexico) (9%), private (34%), and

Tribal (2%).

Baseline Analysis

The following discussion describes the regulatory circumstances that would exist without critical habitat designated for this species. In the baseline scenario, section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of this species.

Conservation plans and regulatory mechanisms that provide some protection to the species and its habitat without critical habitat

Federal Regulations/Statutes

Endangered Species Act. Concurrent with the proposed designation of critical habitat, the jumping mouse is being proposed for listing as endangered under the Act. Listing provides opportunity for conservation and protection under sections 6, 7, 9, and 10 of the Act. These include cooperative actions with States (Section 6), consultation with Federal agencies for actions that may affect the species (Section 7(a)(2)); protection against take of the species (“take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct) (Section 9); cooperative actions with other entities and landowners for the purpose of scientific or enhancement of survival activities involving take (Section 10(a)(1)(A) permit); and lastly, habitat conservation planning under Section 10(a)(1)(B) of the Act.

In addition, a number of species listed as threatened or endangered under the Act also occur within the same riparian and/or aquatic habitats or in areas designated as critical habitat that are used by the jumping mouse: Three Forks springsnail, southwestern willow flycatcher, little Colorado spinedace, Mexican spotted owl, whooping crane, loach minnow, and Sacramento Mountains thistle. As a result, the jumping mouse receives some collateral benefits in areas of habitat overlap. For example, because water is also essential for the Three Forks springsnail, southwestern willow flycatcher, loach minnow, and Sacramento Mountains thistle, their habitat requirements can help protect similar habitat of the jumping mouse.

Federal Land Policy and Management Act. 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).

National Forest Management Act. The National Forest Management Act of 1976 directs that the National Forest System "...where appropriate and to the extent practicable, will preserve and enhance the diversity of plant and animal communities." Additionally, sec. 219.12(g) requires the maintenance of viable populations of native vertebrates in National Forests.

Clean Water Act. Congress passed the Federal Water Pollution Control Act Amendments of 1972 and the Clean Water Act (CWA) of 1977 to provide for the restoration and maintenance of the chemical, physical, and biological integrity of the nation’s lakes, streams, and coastal waters. Primary authority for the implementation and enforcement of the CWA now rests with the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE). In addition to the measures authorized before 1972, the CWA implements a variety of programs, including: Federal effluent limitations and state water quality standards, permits for the discharge of pollutants and dredged and fill materials into navigable waters, and enforcement mechanisms.

Section 404 of the CWA is the principal Federal program that regulates activities affecting the integrity of wetlands. Section 404 prohibits the discharge of dredged or fill material in jurisdictional waters of the United States, unless permitted by COE under § 404(a) (individual permits), 404(e) (general permits), or unless the discharge is exempt from regulation as designated in § 404(f).

The limits of jurisdictional waters of the United States (the area covered under § 404) are determined by: 1) in the absence of adjacent wetlands, jurisdiction extends to the ordinary high water mark; or 2) when adjacent wetlands are present, jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands; or 3) when the water of the United States consists only of wetlands, jurisdiction extends to the limit of the wetland. Riparian habitat in the Southwest is usually above the ordinary high water mark and often does not meet the definition of jurisdictional wetlands of the United States.

Section 402 of the CWA is the principal Federal program that regulates activities affecting water quality. One of the most significant features of the 1972 CWA is the creation of a National Pollutant Discharge Elimination System (NPDES). Except as otherwise provided in the CWA, industrial sources and publicly owned treatment works may not discharge pollutants into navigable waters without a permit. The EPA or state authorized programs may issue a permit for discharge upon condition that the discharge meets applicable requirements, which are outlined extensively in the CWA and which reflect, among other things, the need to meet Federal effluent limitations and state water quality standards.

Federal Land Management

U.S. Forest Service - The jumping mouse has been on the Regional Forester's Sensitive Species List since 1990 (Forest Service 1999, p. 17; 2007, p. 34). 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 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 jumping mouse to conserve or avoid impacts to the species or its habitat.

U.S. Bureau of Land Management - The U.S. Bureau of Land Management (BLM) does not consider the jumping mouse as a "Special Status Species". Consequently, no specific protection or land-management consideration is afforded to that species on BLM lands. Nevertheless, the BLM lands comprise only 6 acres (less than 1%) of the proposed Florida River, Colorado, critical habitat unit.

U.S. Fish and Wildlife Service National Wildlife Refuges - There is one National Wildlife Refuge (NWR) within proposed critical habitat for the jumping mouse, Bosque del Apache NWR; it occurs within New Mexico. Section 7(a) of the Act 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. We have completed one informal conference with Bosque del Apache NWR on an action that may affect the jumping mouse.

State Wildlife Laws

Arizona - The AGFD has included the jumping mouse in Wildlife of Special Concern in Arizona (WSCA) (AGFD 2005, p. 3). 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 (AGFD 1996, entire). The jumping mouse is listed as a threatened species on the WSCA (AGFD 1996, p. 25). The WSCA list is used by AGFD cooperators and outside contractors for projects developed and reviewed for environmental compliance under the National Environmental Policy Act (NEPA), the Act, and other Federal laws. However, this designation provides no regulatory protection for the jumping mouse in Arizona because the WSCA list does not address habitat protection, indirect effects, or other threats to this species.

New Mexico - New Mexico State law provides some protection to the jumping mouse. In 2006, the New Mexico Department of Game and Fish (NMDGF) reclassified the jumping mouse from threatened to endangered under state law, after they determined that the most immediate threat to the species was from the very substantial reduction in vegetation along streams in many areas of historic occurrence due to drought and excessive livestock grazing (NMDGF 2006, p. 120). Endangered status under New Mexico State law was reaffirmed recently based on continuing threats (NMDGF 2012, pp. 6-8). 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 (NMDGF 2006, p. 430). 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 jumping mouse as a Species of greatest conservation need, Tier 1 (CDOW 2006, p. 40). As such, the 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 jumping mouse in Colorado.

Private and Tribal Land Management

The Service has not received any private or tribal management plans for the jumping mouse.

One private landowner along Nutrioso Creek, Arizona, manages lands to benefit native species, including the southwestern willow flycatcher and little Colorado spinedace. In 2003, the Service established a voluntary safe harbor agreement with this landowner (Service 2003a, entire).

Federal agencies and other project proponents likely to consult with the Service under section 7, without critical habitat

Federal agencies and other project proponents that are likely to consult with the Service if no critical habitat is designated include the following:

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).

Expected Service administrative effort for section 7 consultations without critical habitat

The jumping mouse has not had any previous Federal status so there is no consultation history, although it has been a candidate species since 2007. Candidate species have no statutory protection under the Act (61 FR 7596-7613, February 28, 1996). While the Service does not require Federal agencies to confer or consult on candidate species, candidates are often considered during the consultation process for other listed species. From December 2007 through late-2012, the jumping mouse has been included in six informal conference concurrences. Four of these conferences involved actions where neither the species nor suitable habitat was present. However, two of these conferences were in occupied areas; on Bosque del Apache NWR and in Sugarite Canyon. The Bosque del Apache NWR intra-Service section 7 conference involved riparian vegetation and water management to establish a heron rookery, whereas Sugarite Canyon was an emergency conference with the U.S. Army Corps of Engineers to construct soil retention basins following a wildfire.

Even though there have been few consultation records for the jumping mouse, we anticipate baseline costs for section 7 consultation without critical habitat to include initiation of consultation on riparian habitat restoration, fire management plans, fire suppression, fuel reduction treatments, forest plans, livestock grazing allotment management plans, travel management plans recreational use (with U.S. Forest Service), water management and delivery (with Bureau of Reclamation, Army Corps of Engineers, and Fish and Wildlife Service), bridge and road realignment projects (Federal Highways Administration), National Wildlife Refuge planning and projects, beaver management (Department of Animal and Plant Health Inspection Service), and restoration or recovery activities that may affect this species.

What types of project modifications would likely be recommended by the Service to avoid jeopardy (i.e., the continued existence of the species)?

The jumping mouse is reliant upon specific habitat conditions for normal behaviors. Habitat requirements are characterized by tall (averaging at least 61 cm (24 in)), dense herbaceous riparian vegetation composed primarily of sedges and forbs (Service 2013, entire). This vegetation is an important resource need for the jumping mouse because it provides vital food sources (insects and seeds), as well as the structural material for building day nests that are used for shelter from predators. It is imperative that the jumping mouse have rich abundant food sources during the summer so it can accumulate sufficient fat reserves to survive their long hibernation period. This suitable habitat is only found when wetland vegetation achieves full growth potential associated with perennial flowing water.

For actions located on Federal lands, or subject to consultation through a Federal nexus (e.g. Federal funds and permits), a jeopardy analysis for the jumping mouse would examine the magnitude of a project's impact relative to the 29 populations confirmed to exist since 2005 across the species' entire range. However, there is uncertainty regarding the current status of the 29 populations that have been found since 2005 because 11 of the 29 populations have been substantially compromised since 2011 (due to water shortages, grazing, or wildfire and postfire flooding), and these populations could already be extirpated. Moreover, an additional seven populations may continue to experience loss of habitat from postfire flooding in the near term. Because no newer information has shown the New Mexico meadow jumping mouse to be extirpated from any of these locations, we find 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. Nevertheless, actions that are subject to consultation through a Federal nexus will likely conduct surveys for the New Mexico meadow jumping mouse to determine whether the project will impact occupied or unoccupied habitat. This is a key difference between our determination that an area is occupied at the time of listing and updating the current status of species within a specific area for consultation purposes.

The Service must consider the magnitude of harm to all remaining members of the species as a result of any action that reduces the survival of individual mice and reduces opportunities for recovery in the wild. Furthermore, the jeopardy analysis would focus on effects to the species' reproduction, recruitment, population density and distribution, including an analysis of actions that would result in temporary and permanent destruction and modification of the currently occupied jumping mouse habitat. Actions should be avoided that completely remove or significantly alter the amount or height of dense herbaceous riparian in occupied habitat. The occupied areas include the 29 locations that contain suitable habitat plus an additional 0.8 km-segment (0.5- mi) upstream and downstream of these capture localities. These additional 0.8 km-segments (0.5-mi) are considered occupied because this is approximately the maximum dispersal distance that an individual jumping mouse has been observed to travel (744 meters,

2,441 feet; Frey and Wright 2012, pp. 16, 109). Areas containing dense herbaceous riparian habitat should be no more than about 100 m (330 ft) apart within these waterways, which would encompass the majority of daily and seasonal movements of individual mice (Frey and Wright 2012, p. 109). This configuration of habitat provides for a local population to be “functionally connected”, such that the movements of the majority of individual mice and perhaps occasional inter-population dispersal occur unimpeded.

The loss of dense riparian herbaceous vegetation that serves as suitable habitat for the jumping mouse has already resulted in the loss of many local populations of the species and is the most important stressor to the jumping mouse viability. Without sufficiently sized connected areas of suitable habitat, the jumping mouse has been unable to respond to the modification of habitats and is likely to continue to lose populations due to ongoing and future habitat loss. Because of historical, current, and future habitat loss, all of the 29 populations found since 2005 occur within extremely small patches of suitable habitat and most likely contain very few jumping mice resulting in low population resiliency. Because of this habitat loss, these populations have a low likelihood of long-term survival (beyond 10 years) and put the species at low viability rangewide. Conservation of the 29 populations is vital for maintaining the overall redundancy and representation for the species. We conclude the species’ overall level of extinction risk is high, given the ongoing and likely future losses of habitat in conjunction with the disjunct and isolated nature of populations. Therefore, when a population is lost or reduced in size to the point where species survival at that location is low and when that loss occurs in an area where remaining numbers, size, and distribution of protected populations is not enough to provide for recovery, then the proposed action under consultation would be considered to jeopardize the listed species in the wild.

To date, there have been no conferences or consultations that have resulted in a finding of jeopardy for the jumping mouse because there are no Federal regulatory requirements in place to protect them. However, as with any federally listed species, jeopardy may be avoided through proposed conservation measures and project modification, such as land acquisition and management, changes in project timing, or other management options.

If we determine that an action jeopardizes the jumping mouse, in future section 7 consultations, recommended project modification could include one or more of the measures listed below, depending on the proposed action (this is not an all-inclusive list):

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 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 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.

Incremental Effects Analysis

The following discussion describes the regulatory circumstances that are anticipated with critical habitat, as proposed, for the jumping mouse. 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.

We are proposing 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). The vast majority of each of the proposed critical habitat units are considered unoccupied and currently contain small areas of suitable habitat. We consider 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 habitats 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).

For each of the 19 areas (encompassing 29 locations) considered occupied, we are proposing critical habitat units that include areas that are considered unoccupied adjacent to the occupied areas. The occupied areas within these 19 proposed units may require special management or protection to address the direct or indirect loss or alteration of the essential physical and biological features. Every proposed critical habitat unit contains areas outside the geographic area occupied by the species at the time of listing (unoccupied areas) that we conclude are essential for the conservation of the jumping mouse. The unoccupied areas are located up- or downstream of the occupied areas, but do not currently have the necessary vegetation to protect jumping mice from predators or to provide food sources (though we believe it can regrow and develop into suitable habitat), and are beyond the maximum dispersal distance of 0.8 km (0.5 mi) from populations within the units. Thus, these areas are considered to be currently unoccupied. We describe these units containing both occupied and unoccupied areas within the same stream reach as partially occupied.

We next considered whether there were any other areas within the species' historical range but outside of the geographic area occupied at the time of listing (in other words completely unoccupied areas) that are essential for the conservation of the jumping mouse. We found that the conservation of the species requires increasing the number and distribution of populations of the jumping mouse to allow for the expansion of recently located populations into areas that were historically occupied within the Jemez Mountains, Sacramento Mountains, and the middle Rio Grande Valley. We found four subunits (Rio de las Vacas, Upper Rio Peñasco, Isleta Pueblo, and Ohkay Owingeh Pueblo) within three conservation areas that are completely unoccupied, but are essential for the conservation of the jumping mouse. Because of ongoing habitat loss, the conservation of the jumping mouse requires the protection of stream reaches with a high potential to develop suitable habitat and enable the reestablishment of the jumping mouse within these unoccupied subunits in areas that were historically occupied.

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, into currently unoccupied areas that need to reestablish suitable conditions. The ability of jumping mouse populations to be resilient to adverse stochastic events depends on the robustness of a population and the ability to recolonize if populations are extirpated.

Regeneration of suitable habitat in these areas 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, we would expect some conservation measures to be implemented to avoid destruction or adverse modification.

Once critical habitat is designated, section 7(a)(2) of the Act requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat. The key factor related to adverse modification is whether, with implementation of the proposed Federal action, the affected critical habitat will continue to have the capability to serve its intended conservation role 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.

What additional Federal agencies or project proponents are likely to consult with the Service under section 7 with designated critical habitat? What kinds of additional activities are likely to undergo consultation with critical habitat?

In occupied critical habitat, the same Federal agencies and project activities listed above as incurring 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 or 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), we also expect consultation to 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. For example, livestock grazing that would result in the loss of remaining populations through the alteration (reduction below 24 inches) or elimination of dense herbaceous riparian vegetation necessary for the survival of jumping mice may result in both a jeopardy and adverse modification conclusion. Another example would be a water diversion project that results in diminished or no water flow within the active stream channel, ditch, or canal causing loss of dense herbaceous riparian vegetation as the habitat dries. 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 an 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, we do not anticipate measurable incremental effects in regard to developing and implementing conservation measures in currently occupied critical habitat for the jumping mouse.

However, within unoccupied areas of designated critical habitat, we expect that for a proposed action to result in adverse modification (in other words, to substantially reduce the conservation function of the critical habitat designation overall), it would likely have to dramatically alter large sections that would impact the physical and biological features and the development or reestablishment of PCEs, such as the activities described below. 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. We would anticipate incremental effects in regard to developing and implementing conservation measures because no section 7 consultation would have likely occurred without the critical habitat designation.

In unoccupied units of critical habitat, we are unaware of currently planned Federal actions that could adversely affect or adversely modify critical habitat. However, any project that may occur in unoccupied areas would need to be evaluated for its effect to critical habitat, especially 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 this 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 recovery goals in that critical habitat unit. 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 areas.

We anticipate there would be differences in how we conduct our 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, our 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. The concept of using habitat as a proxy, or surrogate, for species numbers was upheld in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F.3d 1059 (9th Cir. 2004), as amended by 387 F.3d 968 (9th Cir. Wash., Oct. 28, 2004). 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. We anticipate 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, we anticipate incremental effects 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.

What types of project modifications might the Service make during section 7 consultation to avoid destruction or adverse modification of critical habitat that are different than those for avoiding jeopardy?

Although we do not currently have a regulatory definition of adverse modification, we rely on the statutory definition in light of the *Gifford Pinchot* ruling that provides some guidance in distinguishing different standards for determination of jeopardy and adverse modification. Adverse modification is considered a higher standard of preventing substantial loss of the conservation value of the critical habitat segment to help achieve recovery of the species.

In the case of the jumping mouse, we anticipate that additional project modifications as a result of designating critical habitat are predictable because: (1) the majority of each proposed critical habitat unit is considered unoccupied by the species; and (2) the jumping mouse is intimately tied to its habitat such that any potential project modifications to avoid adverse modification of unoccupied critical habitat would likely differ substantially from those that are likely to be required to avoid jeopardizing this species. This difference in anticipated project modifications results from the difference in the riparian vegetation within occupied and unoccupied areas within units. The unoccupied areas of proposed critical habitat do not presently contain suitable habitat. All of these completely or partially unoccupied areas currently contain flowing water that is required for future regeneration of the physical and biological features of habitat required to sustain the species' life-history processes. These unoccupied areas will require reestablishment of the PCEs, and are essential to the conservation of the mouse because having multiple local populations within each critical habitat unit is the best defense against local extirpation and complete extinction. There is nothing to indicate that the situation will improve without significant conservation intervention focused on allowing the currently lacking physical features related to the wetland vegetation to regrow (either naturally or through management or protection) into suitable habitat. For example, reestablishing PCEs can likely be accomplished from mowing at different times of the year, fencing riparian areas, or changing the livestock grazing regime. Alternatively, if we determine that the project will adversely modify occupied critical habitat, any potential project modifications to avoid adverse modification of occupied critical habitat are most likely also going to be required to avoid jeopardizing this species. These potential project modifications to avoid jeopardy are listed as items 1 through 7 above. If we determine that an action adversely modifies unoccupied critical habitat, in future section 7 consultations, recommended project modifications could include one or more of the measures listed below, depending on the proposed action (this is not an all-inclusive list).

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.

How much administrative effort will the Service likely expend to address adverse modification in its section 7 consultations with critical habitat? Estimate the difference compared to the baseline and explain how you arrived at it.

We anticipate some increase in overall consultation workload and administrative efforts related to the designation of jumping mouse critical habitat, including: (1) the potential increase in the number of consultations resulting from unoccupied areas being proposed as critical habitat; and (2) initiation of consultations for ongoing projects to address adverse effects to critical habitat, and (3) possible project modification to avoid adverse modification of critical habitat in areas where significant alteration of habitat is likely or where regeneration of habitat will be precluded. We expect the majority of this workload will be addressing effects to critical habitat that do not constitute adverse modification within unoccupied areas.

The amount of increased administrative effort due to proposed critical habitat is difficult to foresee and quantify. When we complete consultations for activities potentially affecting critical habitat for the jumping mouse, the consultations must evaluate whether the activities would result in adverse modification. Activities that may adversely affect the PCEs, but not destroy or adversely modify critical habitat could include livestock grazing, mowing, or water management projects that could reduce the amount of habitat available but do not completely eliminate the

opportunity for habitat establishment, population expansion, and individual jumping mice dispersal from occupied habitats to regenerated habitats.

What project proponents are likely to pursue habitat conservation plans (HCPs) under section 10 after the designation of critical habitat?

About 45 percent of land proposed for designation as critical habitat is non-Federal land. Outside of the Florida River location and the State lands (Navajo State Park, and Lake Dorothey, Colorado; and Sugarite Canyon, Coyote Creek, Fenton Lake, and Seven Springs Fish Hatchery, New Mexico), it is unknown whether much of the non-Federal lands are occupied because access is limited. Therefore, it is unlikely that an appreciable increase in administrative costs for habitat conservation planning under section 10 (HCP) would occur with the designation of critical habitat. Potential proponents for habitat conservation planning under section 10 of the Act may include the Florida River Project, State lands, and other non-Federal entities or landowners that may decide to apply for an HCP.

Conclusion

In summary, the incremental effects of the designated critical habitat for the jumping mouse may increase the economic impacts of designating CH for the species above those baseline impacts imposed by listing the species depending on whether the proposed Federal action affects occupied or unoccupied critical habitat. We believe that project modifications are not likely to differ substantially as a result of avoidance of critical habitat destruction or adverse modification versus avoidance of species jeopardy when the proposed Federal action only affects occupied critical habitat. Within occupied habitat, project modifications would likely focus on a proposed project's impacts to the physical or biological features that are currently present and that collectively define the PCEs for this species. However, for Federal actions that affect unoccupied critical habitat, it is likely that project modifications will seek to avoid a particular area or avoid precluding the regeneration of riparian habitat along streams, ditches, and canals that currently contain flowing water. These unoccupied areas will also require reestablishment of the physical or biological features (except flowing water) that are currently lacking. We appreciate the opportunity to provide this information to you. If you have any questions or request clarification of any of the items described here, please do not hesitate to call Eric Hein at (505) 761-4735.

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