

New Mexico Meadow Jumping Mouse
(Zapus hudsonius luteus)

5-Year Review:
Summary and Evaluation

U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office
Albuquerque, New Mexico

January 30, 2020

5-YEAR REVIEW

New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)

1.0 GENERAL INFORMATION

1.1 Listing History

Species: New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)

Date listed: June 10, 2014

Federal Register citations:

- June 10, 2014. Determination of Endangered Status for the New Mexico Meadow Jumping Mouse Throughout Its Range (79 FR 33119)
- March 16, 2016. Designation of Critical Habitat for the New Mexico Meadow Jumping Mouse; Final Rule (81 FR 14263)

Classification: Endangered

1.2 Methodology used to complete the review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a 5-year review is to assess each threatened species and endangered species to determine whether its status has changed and it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service (Service) recently evaluated the biological status of the New Mexico meadow jumping mouse to update the original 2014 Species Status Assessment (SSA) report (Service 2014). The original SSA report supported the listing of the species as endangered in 2014 and the designation of critical habitat in 2016 within eight separate geographical management areas (GMAs). The updated SSA report (Service 2020) contains the scientific basis that the Service is using to inform this 5-year review, guiding future research projects that will answer key questions about the life history and ecology of the species, and supporting further recovery planning and implementation.

Our updated SSA report for the New Mexico meadow jumping mouse included input from tribes, state wildlife agencies, academic researchers, federal land management agencies, and non-governmental organizations engaged in New Mexico meadow jumping mouse conservation efforts throughout its range. It was independently reviewed by eight peer reviewers and multiple partners, who submitted significant relevant comments to the Service that were incorporated in this update. We referenced newer scientific and commercial information that has become available since 2014. We also incorporated new information in our files acquired since listing. The updated SSA report presents our evaluation of the best available scientific information, including the resource needs and current condition of the species.

Additionally, we solicited data for this review from interested parties through a May 31, 2018, Federal Register Notice announcing this review (83 FR 25034). Information received from this data call was included as appropriate in the SSA revision and considered in our determination of any change in status to this species at this time.

1.3 FR Notice citation announcing the species is under active review:

May 31, 2018. Initiation of 5-Year Status Reviews of 38 Species in the Southwest Region (Arizona, New Mexico, Oklahoma, and Texas); Notice of initiation of reviews; request for information. (83 FR 25034).

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy:

There currently is no DPS designated for the New Mexico meadow jumping mouse, nor has there been any proposal for such designation since listing of the species in 2014.

2.2 Recovery Criteria:

A recovery outline was completed in 2014 when the species was listed as endangered. This recovery outline was based on the information known at the time and included in the 2014 SSA. It describes the main threats to the viability of the species as habitat loss and degradation, primarily from historic grazing practices, habitat fragmentation, small isolated populations at high risk for local extirpation, regional drought and ineffective water management in riparian habitat, unregulated recreation, and catastrophic events such as severe wildfires and floods. Other threats include future development and road construction. The 2014 recovery outline describes preliminary objectives and actions needed for recovery. It can be found at two websites: (<http://www.regulations.gov>) and (<http://www.fws.gov/southwest/es/NewMexico/index.cfm>). We continue to support the objectives and promote the conservation actions in the 2014 recovery outline for the continued conservation of the species until a recovery plan is completed, likely by the end of 2020.

We do not consider threats to the viability of the species to have been eliminated or moderated to where the viability of the species has been sufficiently improved. Even though 39 new detections were made since listing in 2014, these are still primarily in the eight GMAs, within or near to designated critical habitat. The New Mexico meadow jumping mouse needs multiple resilient populations distributed throughout different drainages within the eight GMAs to have high viability. Since 2014, all known populations continue to have low resiliency, low redundancy owing to the low resiliency of all known populations, and low representation, given that only 4 of the 8 GMAs are known to have more than five populations.

2.3 Updated Information and Current Species Status

2.3.1 Biology and Habitat:

Our updated SSA report (Service 2020) provides a detailed summary of the biology, habitats, and current and future conditions for the New Mexico meadow jumping

mouse, which we summarize here. The species is a small rodent that lives in densely vegetated riparian areas along streams from southern Colorado and central New Mexico to eastern Arizona. It has exceptionally specialized habitat requirements. Specifically, the jumping mouse requires tall (averaging 61 centimeters (24 inches)), dense riparian herbaceous vegetation primarily composed of sedges and forbs with some shrub component. This suitable habitat is only found when wetland vegetation achieves full growth potential associated with seasonally available or perennial flowing water.

Habitat consists of tall (average stubble height of at least 61 centimeters (cm) (24 inches (in)) and dense riparian herbaceous vegetation (Frey 2005, 2007, 2011; Frey and Malaney 2009). Recent surveys continue to record this specific habitat requirement (Chambers 2018a, Frey 2017, Zahratka 2019). New Mexico meadow jumping mice were recently captured in three different locations in southwestern Colorado in herbaceous vegetation between 76 cm (29.9 in) to 106 cm (41.7 in) (Zahratka 2019) and in the White Mountains of Arizona in herbaceous vegetation averaging 61 cm (24.9 in) (Frey 2017). Chambers (2018a) modeled capture site data and determined that New Mexico meadow jumping mice in the White Mountains of Arizona occurred in habitat with a mean vegetative height of 89 cm (35 in). We have not received any information that demonstrated the occurrence of New Mexico meadow jumping mice in habitat with herbaceous vegetation lower than 61cm (24 in).

At the time of listing in 2014, some populations of the New Mexico meadow jumping mouse in northern New Mexico and southern Colorado were known to be sympatric with the western jumping mouse (*Zapus princeps*) and separated by elevation. The western jumping mouse had consistently been found above 8,000 feet (ft) (>2,438 meters (m)) and the New Mexico meadow jumping mouse below 8,000 ft (<2,438 m) (Frey 2006). Recently, western jumping mice were detected below 8,000 ft in southwestern Colorado (Zahratka 2018) and New Mexico meadow jumping mice were detected above 8,000 ft in northern New Mexico (Chambers 2018b). This new information will be important to consider in future field identification of trapped *Zapus* specimens during monitoring efforts. We may require a greater reliance on genetic analysis of tissue samples to assure correct species identification in areas of sympatric occurrence.

There is still uncertainty about some natural history information, such as the location and habitat characteristics of hibernacula, the timing of hibernation, and population sizes needed for self-sustainability and resilience. Recent ongoing field research has been using radio telemetry on New Mexico meadow jumping mice in an effort to locate hibernacula and measure habitat characteristics of these sites. No confirmed hibernacula have been located yet from these efforts. However, there has been cautious reporting of four probable hibernacula in the Sambrito Creek Critical Habitat Unit in southern Colorado (Zahratka 2016). These sites ranged between about 3.3 to 33 ft (1 to 10 m) from perennial flowing water in upslope habitat. While this is preliminary information, it does indicate that New Mexico meadow jumping mice may be choosing hibernation sites outside of floodplains. Until new information on hibernacula is obtained, this can be useful in planning for recovery actions in riparian habitat and

avoiding potential harm to hibernating New Mexico meadow jumping mice from activities consulted on with the Service.

2.3.2 Threats Analysis (threats, conservation measures, and regulatory mechanisms):

Chapter 4 of the revised SSA (Service 2020) provides a detailed description of the stressors that still affect the species. The table below describes the major stressors to the species cited in the listing rule and their current threat to the species:

Listing Factor	Threat Description
<p>Factor A: The present or threatened destruction, modification, or curtailment of its habitat or range</p>	<p>These factors continue to be the primary threats to the species throughout its range. Habitat destruction and isolation significantly compromised at least 11 of the 29 known populations from 2011 to 2014, as described in the listing rule. Livestock grazing continues to be the major source of habitat destruction. Grazing has been modified or eliminated in some critical habitat. However, these conservation efforts have not occurred at a level sufficient to reduce the threat to a level that justifies any change to its current endangered status.</p>
<p>Factor B: Overutilization for commercial, recreational, scientific, or educational purposes</p>	<p>We have no information that indicates overutilization for commercial, recreational, scientific, or educational purposes pose a substantial risk to the New Mexico meadow jumping mouse. Ongoing research has resulted in very few mortalities from live trapping or telemetry efforts; therefore, these activities do not pose a threat to the viability of the species.</p>
<p>Factor C: Disease or predation</p>	<p>We have no information that indicates disease or predation pose a substantial risk to the New Mexico meadow jumping mouse. There is no available information that indicates disease or predation is currently or likely to become a substantial concern to the jumping mouse in the future.</p>
<p>Factor D: Inadequacy of existing regulatory mechanisms</p>	<p>Most State and Federal laws are currently inadequate in removing or reducing threats to the subspecies. The jumping mouse has been on the U.S. Forest Service Sensitive Species List since 1990. This designation does not provide protection from Forest actions, but only requires it to be considered in Forest planning. The species was classified as endangered by the New Mexico Department of Game and Fish in 2006, and as a Species of Greatest Conservation Need by Arizona Game and Fish Department (2012) and Colorado Parks and Wildlife (2015). New Mexico and Colorado designations provide some protections against take, but do not protect the species' habitat. Arizona regulations currently have few provisions for the species.</p>
<p>Factor E: Other natural or manmade factors</p>	<p>Unregulated recreation (e.g., camping, fishing, boating, ATV use) can modify habitat conditions for New Mexico meadow jumping mice detrimentally. This can reduce forage and vegetation cover,</p>

	<p>increasing metabolic stress and predation risk. Catastrophic events such as prolonged drought and increased risks of severe wildfire and floods can all have detrimental effects on local populations.</p>
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2.4 Synthesis:

The Act defines an endangered species as any species that is “in danger of extinction throughout all or a significant portion of its range” and a threatened species as any species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” After evaluating threats to the species and assessing the cumulative effects of the threats under the section 4(a)(1) factors, we conclude that the New Mexico meadow jumping mouse remains in danger of extinction throughout all of its range.

The range of this formerly widespread species has been severely reduced, currently occurring only within eight GMAs with designated critical habitat. The species still faces threats primarily from habitat loss and modification and the risk of local extirpations owing to the small size and isolation of the remaining populations. These and other factors such as drought, poor water management, and risk of catastrophic fires or floods continue to have significant and direct impacts to population resiliency. Currently, grazing modification, riparian exclosures and other habitat improvement efforts have not resulted in significant changes in population status. Only four of the eight recognized GMAs are known to have more than five populations. Some populations within critical habitat have not had any successful detections in recent years. Low population numbers in the GMAs continue to risk local extirpations from the lack of genetic diversity and other factors associated with the known vulnerability of small populations (Soulé 1987; Traill *et al.* 2010). Low population resiliency and reduced redundancy and representation for the species as a whole continues to put the viability of the species at risk. In our overall assessment of current conditions of the demographic and habitat factors that affect the species, only three populations were considered to be in moderate condition, and one was considered to be in very low condition (Table 6 in Service 2020).

These factors support our previous evaluation that the New Mexico meadow jumping mouse continues to meet the definition of an endangered species under the Act. Our review of new information, as documented in our updated SSA report (Service 2020) and summarized in this 5-year review, does not change our evaluation of species status and the threats affecting the species under the factors in section 4(a)(1) of the Act from our original determination of the species status in the listing rule (June 10, 2014; 79 FR 33119). Therefore, we recommend no change in status to the species at this time.

3.0 RESULTS

3.1 Recommended Classification:

We believe that, based on the continued low viability of the species throughout its range, the New Mexico meadow jumping mouse remains in danger of extinction throughout all of its range. Therefore, we recommend that it remain classified as endangered at this time.

 Downlist to Threatened

Uplist to Endangered

 Delist (*Indicate reasons for delisting per 50 CFR 424.11*):

 The species is extinct

 The species does not meet the definition of an endangered species or a threatened species (i.e., is recovered, or new information on status and threats indicate species does not meet definitions)

 The listed entity does not meet the statutory definition of a species.

 X **No change is needed**

3.2 Recovery Priority Number:

No change in the current Recovery Priority Number (3C) is required at this time.

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

Few of the 77 populations identified since 2005 have large enough intact habitat areas to provide for resilient populations, indicating the subspecies lacks adequate resiliency and redundancy. Restoration of New Mexico meadow jumping mouse habitat will play an important role in the future viability and recovery of populations and should be a priority (Chapter 6 in Service 2020). There are many opportunities for habitat improvement and other conservation measures described in the updated SSA. These include:

- the design, installation and maintenance of effective barriers or exclosures to control incompatible livestock or other grazing in riparian areas and protect these habitats from damage;
- implementing water use and management strategies compatible with New Mexico meadow jumping mouse needs;
- utilizing restrictions on highway reconstruction such as seasonal restrictions and avoidance;
- reducing fuels to minimize the risk of severe wildland fire; and
- managing and restoring beaver populations or using beaver dam analogs where restoration is not feasible.

There are also many opportunities for New Mexico meadow jumping mouse research to fill in gaps in our knowledge of some aspects of natural history (e.g., reproduction, abundance, survival, movement behavior) and species genomics. We still know very little about hibernacula locations or habitat characteristics. Some research is ongoing to locate hibernacula and measure habitat characteristics using radio telemetry, but with poor results to date. This species hibernates for 8-9 months per year, making this a critical aspect of the life history of the species that we need to understand better in planning for recovery actions. We need to know how much habitat individual mice need to survive and how this factors into determining what population sizes to target in each of the GMAs. We also need to know whether jumping mice differentially use long contiguous linear stretches of restored habitat or a series of small non-contiguous linear segments only separated by distances that this species is known to travel. This information is critical to planning for effective habitat protection and restoration efforts that will best support recovery.

We are still advocating for the implementation of conservation recommendations described in the 2014 recovery outline referenced above in section 2.3 until the recovery plan is completed. These include actions that can be taken to restore habitat at the landscape and microhabitat level. The recovery outline also has recommendations for research needs pertaining to life history and genetic diversity status of the species and captive breeding and salvage from high severity catastrophic events, which we will carry over into the recovery plan.

5.0 REFERENCES

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**U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW
NEW MEXICO MEADOW JUMPING MOUSE (*Zapus hudsonius luteus*)**

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: 3C

FIELD OFFICE APPROVAL:

Field Supervisor, Fish and Wildlife Service, New Mexico Ecological Services Field Office

Approve Susan S. [Signature] 30 January 2020