

Meadow Jumping Mouse

Zapus hudsonius

REGULATORY STATUS

USFWS: No special status
USFS R2: No special status
USFS R4: No special status
Wyoming BLM: No special status
State of Wyoming: Nongame Wildlife

CONSERVATION RANKS

USFWS: No special status
WGFD: NSS4 (Bc), Tier III
WYNDD: G5, S3
Wyoming Contribution: LOW
IUCN: Least Concern

STATUS AND RANK COMMENTS

Two subspecies of Meadow Jumping Mouse (*Zapus hudsonius*) are listed under the Endangered Species Act. Preble's Meadow Jumping Mouse (*Z. h. preblei*) is listed as Threatened throughout its range in Colorado and Wyoming¹, and the New Mexico Jumping Mouse (*Z. h. luteus*) is listed as Endangered throughout its range in Arizona, Colorado, and New Mexico². However, Meadow Jumping Mouse at the species level has no additional regulatory status or conservation rank considerations beyond those listed above. Preble's Meadow Jumping Mouse is discussed in detail separately in a sub-species specific account.

NATURAL HISTORY

Taxonomy:

Twelve subspecies of Meadow Jumping Mouse are currently described, two of which occur in Wyoming – the Preble's Meadow Jumping Mouse and the Bear Lodge Meadow Jumping Mouse (*Z. h. campestris*)³. There has been debate among researchers regarding the merit of historic and current subspecific designations within the species⁴⁻⁶. However, the most recent review supports current sub-specific designations⁷.

Description:

Meadow Jumping Mouse is distinguished by a yellow dorsum with a thick dark stripe down the back, white venter, an exceptionally long tail, and large hind feet. Males and females are identical in appearance. Adults weigh 12–22 g, depending on season, and reach a total length of 180–220 mm³. The tail comprises over half the total length, ranging from 115–136 mm in length, and is round, sparsely haired, and bicolored³. The ears are dark and edged in white. The hind feet are large (28–31 mm) and whitish-yellow. The sides have a yellow hue. Young are similar in appearance to adults but are lighter in color overall³. Meadow Jumping Mouse is difficult to distinguish from Western Jumping Mouse (*Z. princeps*) where they overlap in the

southeastern part of the state, and genetic analyses are the only currently accepted method for identification in that area ⁸.

Distribution & Range:

Meadow Jumping Mouse has a fairly large continental range extending from southern Alaska throughout the southern third of Canada and into the continental United States in the Midwest, Northeast, and Southeast to Mississippi and Alabama; Wyoming represents the westernmost edge of the range in the continental United States ⁹. In Wyoming, *Z. h. preblei* is found in the southeastern corner of the state and is primarily restricted to the Laramie Mountain Range, and *Z. h. campestris* is found in the Black Hills. Distributions of the two subspecies do not overlap ^{3, 10}.

Habitat:

Meadow Jumping Mouse may be found in a variety of habitats but is most commonly found near water, including along ponds, streams, and marshes with dense vegetation ⁹. For example, in the upper Midwest, more individuals were caught in willow-alder thickets and grass/sedge meadows than coniferous swamps and upland coniferous and deciduous forests ¹¹. During the active season, mice are typically found near the stream bed (≤ 100 m), although they are known to range further ¹². Day nests are constructed of woven grass, forb, sedge, and rush, and are often associated with shrubs, trees, or decaying vegetation used to anchor the nest or provide cover ^{13, 14}. Typical hibernacula are underground or underneath logs in nests made of leaves or grass ⁹.

Phenology:

In Colorado, females are typically pregnant by the third week of June and have two reproductive pulses per summer, one in July and one in August ¹⁵. Gestation length is around 18 days ¹¹, and litter size ranges from 4 to 7 ⁹. Males display descended testes and are capable of reproducing for nearly the entire active season ¹⁶. Meadow Jumping Mouse is a true hibernator and hibernates for approximately 210 days per year. Most weight gain occurs in the 2 weeks prior to entering hibernation. Hibernation begins in September or October, and emergence occurs in late May or early June, with males emerging from hibernation before females ⁹.

Diet:

Meadow Jumping Mouse consumes a variety of foods, including invertebrates, primarily lepidopteron larvae and beetles; seeds; berries; nuts; fruits; and subterranean fungi, which may be a particularly important food item. Invertebrates are heavily used early in the season, but seeds are the primary food item overall, particularly grass seeds. The importance of food items shifts throughout the active period and tracks vegetation green-up. Meadow Jumping Mouse has not been documented caching food ⁹.

CONSERVATION CONCERNS

Abundance:

Continental: WIDESPREAD

Wyoming: UNCOMMON

There are no estimates of abundance for Meadow Jumping Mouse in Wyoming, but the species is thought to be uncommon in the state ¹⁷. In Colorado, population estimates ranged from 22.7 ± 7.9 to 85.6 ± 30.3 individuals per stream km. Overall capture success was 3.4 individuals per 100 trap nights ¹⁵. Capture rates tend to be lower in Wyoming (e.g., 0.3 to 0.9 individuals per 100

trap nights)¹⁸; however, data are currently only available from a single season in the southeastern part of the state.

Population Trends:

Historic: UNKNOWN

Recent: UNKNOWN

Historic and recent population trends are unknown. It is assumed that the Preble's Meadow Jumping Mouse subspecies has declined in abundance throughout its range¹⁵, but the species as a whole may be stable in Wyoming.

Intrinsic Vulnerability:

MODERATE VULNERABILITY

Meadow Jumping Mouse is a habitat specialist, requiring dense vegetation along waterways or water bodies, which makes them inherently vulnerable to threats to these habitats. The long duration of hibernation may also contribute to the species' vulnerability by limiting reproductive potential. Although survival tends to be high during the hibernation season, insufficient fat stores may lower overwinter survival; body mass when entering hibernation is the most useful predictor of overwinter survival^{15, 19}.

Extrinsic Stressors:

MODERATELY STRESSED

Meadow Jumping Mouse is most common around riparian and other moist environments, but these environments represent only a small part of the landscape overall and are exposed to a variety of threats^{20, 21}. Because emigration and immigration events might be critical for maintaining local populations, fragmentation of riparian habitats might reduce or eliminate the frequency of these events, making persistence of populations less likely²². Additional habitat modifications, both natural and anthropogenic, might lead to habitat degradation and destruction in Wyoming, such as overgrazing, drought, fires, and floods.

KEY ACTIVITIES IN WYOMING

Nearly all work to date in Wyoming has focused on the federally threatened Preble's Meadow Jumping Mouse, with little to no efforts directed toward the Bear Lodge Jumping Mouse subspecies or the Meadow Jumping Mouse species as a whole. Since initial listing, the Wyoming Natural Diversity Database has conducted extensive research on Preble's Meadow Jumping Mouse, and the Wyoming Game and Fish Department began funding annual surveys to determine presence and delineate range boundaries of the subspecies in 2009 (see the Preble's Meadow Jumping Mouse species account for more details).

ECOLOGICAL INFORMATION NEEDS

Meadow Jumping Mice in Wyoming represent the western geographical range of the species. A better understanding of distribution and ecological boundaries for this species is needed, particularly in the Black Hills. Additionally, many unknowns exist regarding the impacts of landscape-level habitat changes such as fire, drought, and flood. Finally, basic demographic and life history information regarding survival, reproduction, dispersal, density, abundance, and population trends are lacking. Because population size and presence can vary drastically, long-term monitoring is likely needed to acquire robust population estimates.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Nichole L. Bjornlie. Implementing the Recovery Plan for Preble's Meadow Jumping Mouse will continue to be a priority in Wyoming. However, little is known about Meadow Jumping Mice statewide. Consequently, additional priorities will focus on addressing data deficiencies, including presence, trends, and distribution throughout northeastern Wyoming, as well as evaluating the impact of threats on population persistence and demographics statewide.

CONTRIBUTORS

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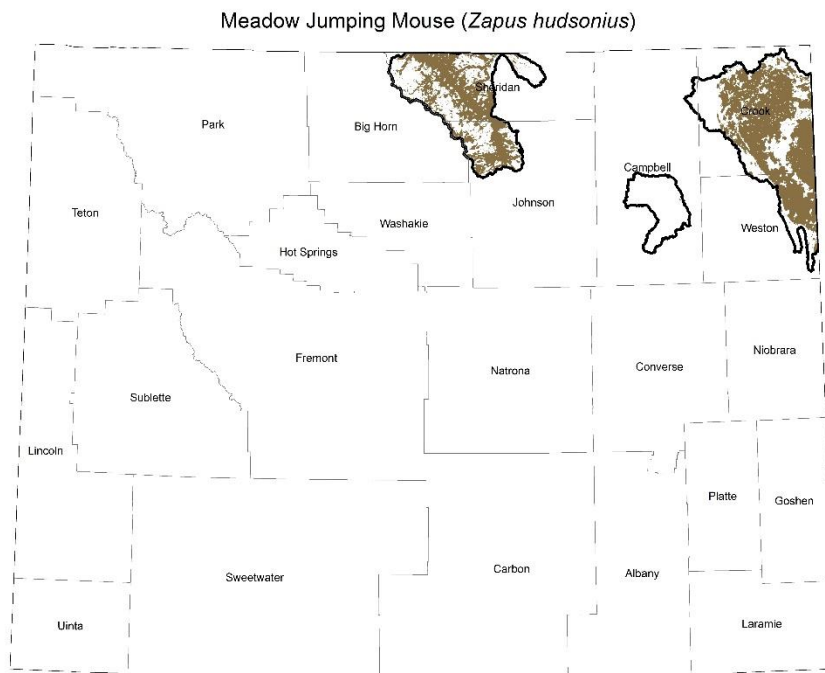
Figure 1: A live-captured jumping mouse (*Zapus* spp.). (Photo courtesy of WYNDD)



Figure 2: North American range of *Zapus hudsonius*. (Map from: Patterson, B. D., et al. (2007) Digital Distribution Maps of the Mammals of the Western Hemisphere, version 3.0, NatureServe, Arlington, Virginia.)



Figure 3: Heavily vegetated riparian corridor with woody overstory along Friend Creek, Albany County, Wyoming. (Photo courtesy of WGFD)



SOURCE: Digital maps of ranges for Wyoming Species of Greatest Conservation Need: Sept. 2016.
Wyoming Game and Fish Department and Wyoming Natural Diversity Database, University of Wyoming, Laramie, Wyoming.
Note that brown indicates the predicted distribution of the species;
heavy black lines indicate outermost boundaries of possible occurrence.
Note: The range and distribution containing Preble's Meadow Jumping Mouse was removed from this map for clarity.
See the Preble's Meadow Jumping Mouse account for details on the subspecies.

Figure 4: Range and predicted distribution of *Zapus hudsonius* in Wyoming.