

Great Basin Pocket Mouse

Perognathus mollipilosus

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: NSSU (U), Tier III
WYNDD: G5, S3S4
Wyoming Contribution: LOW
IUCN: Least Concern

STATUS AND RANK COMMENTS

The Wyoming Natural Diversity Database has assigned Great Basin Pocket Mouse (*Perognathus mollipilosus*) a state conservation rank ranging from S3 (Vulnerable) to S4 (Apparently Secure) because of uncertainty about the abundance and population trends for this species in Wyoming. Also, note that the Global rank (G5) is provisional at this time – NatureServe (Arlington, Virginia) has not yet formalized a Global rank for this species.

NATURAL HISTORY

Taxonomy:

In 2014, Great Basin Pocket Mouse (*P. parvus*) was split into two distinct species based on genetic evidence: Great Basin Pocket Mouse (*P. mollipilosus*) and Columbia Plateau Pocket Mouse (*P. parvus*)¹. Only *P. mollipilosus* is found in Wyoming, but subspecies designations of this newly defined species have not been finalized¹. Due to the extremely recent nature of this taxonomic revision, most references cited in this account refer to Great Basin Pocket Mouse (*P. parvus*) as it was recognized before the split. Research conducted prior to 2014 in areas outside the currently accepted range of *P. mollipilosus* has been excluded from this account because it likely involved Columbia Plateau Pocket Mouse or occurred in areas where distributions of the new species remain in question¹.

Description:

Identification of Great Basin Pocket Mouse is possible in the field. The sexes are similar in appearance, with males averaging slightly larger than females²⁻⁴. Great Basin Pocket Mouse is the largest species of *Perognathus*⁵. Adult weight ranges from 16–30 g, and total length ranges from 148–198 mm³. Tail, hind foot, and ear length ranges from 77–97 mm, 19–27 mm, and 6–10 mm, respectively³. Pelage color is variable among individuals and populations^{2,5}. Dorsal pelage is buff and interspersed to varying degrees with black hairs, leading to an overall appearance ranging from gray to brownish buff to buff^{2,3}. The venter ranges from buff to white.

The hair-covered tail is darker above, light below, and lacks an obvious crest or terminal tuft^{3,4}. Some individuals may have a clear lateral line between the dorsum and venter and/or light auricular patches behind the ears; however, the characteristics of these features appear to be variable across the continental distribution²⁻⁴. Like all pocket mice, Great Basin Pocket Mouse has external cheek pouches that are lined with hair and used for transporting food^{3,4}. Where sympatric, Olive-backed Pocket Mouse (*P. fasciatus*) can be distinguished from Great Basin Pocket Mouse by its shorter tail (57–68 mm) and smaller hind-feet (16–18 mm)³.

Distribution & Range:

The continental distribution of the appropriately named Great Basin Pocket Mouse is centered over the Great Basin of the western United States⁶. Exact range boundaries have not been established for the newly defined *P. mollipilosus* but definitely include areas of central and southern Oregon, western California, most of Nevada and Utah, northwestern Arizona, and southwestern Wyoming¹. Southwestern Wyoming falls on the far eastern edge of the known distribution of *P. mollipilosus*, and confirmed breeding has been documented in 3 of the 28 latitude/longitude degree blocks in the state⁷. Questions remain about the detailed distribution of *P. mollipilosus* in Oregon, whether the species' range extends into southern Idaho and far southwestern Montana, and the extent of sympatry and/or hybridization with Columbia Plateau Pocket Mouse.

Habitat:

Great Basin Pocket Mouse primarily inhabits arid, open, shrublands dominated by Big Sagebrush (*Artemisia tridentata*) and/or Greasewood (*Sarcobatus vermiculatus*), shrub grasslands, and piñon-juniper (*Pinus* spp.-*Juniperus* spp.) woodlands^{2,4,8}; however, the species may also occur in more mesic habitats^{2,8-10}. In Wyoming, the species is found primarily in low-elevation, sagebrush-dominated shrublands and shrub grasslands and occasionally in grassy piñon-juniper foothills^{3,5}. Burrow systems can be up to 1 m in depth and are used for food storage, refuge, and nesting^{2,3}.

Phenology:

The phenology of Great Basin Pocket Mouse in Wyoming is not well known. The species is nocturnal and does not hibernate, but it will enter periods of torpor when temperatures are low or food is limited^{3,4}. Great Basin Pocket Mouse is solitary outside of the breeding season, which occurs from May to August³. Litters of 4 or 5 young (range 2–8) are likely born in May or June, although females may produce a second litter in years when sufficient food resources are available^{2-4,11}.

Diet:

The specific diet composition of Great Basin Pocket Mouse in Wyoming is unknown. Throughout its range, the species primarily consumes a variety of seeds, as well as succulent leaves and insects depending on availability²⁻⁵. Great Basin Pocket Mouse stores seeds in burrows for consumption during the winter and is also known to scatter-hoard seeds in more shallow caches^{3,4,12,13}. The species obtains all water necessary for survival from food^{2,4}.

CONSERVATION CONCERNS

Abundance:

Continental: WIDESPREAD

Wyoming: RARE

There are no robust abundance estimates available for Great Basin Pocket Mouse in Wyoming. An ongoing study designed to survey pocket mouse distributions across the state captured just 9 individuals across 2 of 47 trapping sites surveyed in 2015; however, only 6 of the 47 sites fell within the predicted range of Great Basin Pocket Mouse^{14, 15}. The statewide abundance rank of RARE is based on the species' restricted distribution in Wyoming, and Great Basin Pocket Mouse also appears to be rare within suitable environments in the occupied area⁷.

Population Trends:

Historic: UNKNOWN

Recent: UNKNOWN

Historic and recent population trends for Great Basin Pocket Mouse in Wyoming are unknown.

Intrinsic Vulnerability:

MODERATE VULNERABILITY

Great Basin Pocket Mouse has moderate intrinsic vulnerability in Wyoming because it appears to have low abundance in the state, even within suitable habitat. Although arid sagebrush shrublands are found across much of Wyoming, the environment in southwestern Wyoming is unique in the state and represents the furthest northeast extension of the Great Basin Desert region. As a small mammal with relatively limited dispersal ability, Great Basin Pocket Mouse may have little opportunity for range expansion within the state should major disturbance or loss of existing habitat occur.

Extrinsic Stressors:

SLIGHTLY STRESSED

Primary potential extrinsic stressors to Great Basin Pocket Mouse in Wyoming are loss or degradation of habitat from natural or anthropogenic disturbances. Sagebrush and desert shrublands in the state are vulnerable to energy and infrastructure development, invasive plant species such as Cheatgrass (*Bromus tectorum*), disturbance from off-road vehicles, overgrazing by livestock, drought and climate change, conflicting conservation and management practices, and in some areas expanding conifer woodlands⁷. Great Basin Pocket Mouse appears tolerant of some disturbance in other parts of its distribution, including grazing, burning, mowing, and road effects^{9, 13, 16, 17}. However, the species showed lower abundance in mechanically and chemically treated sagebrush shrublands in Utah¹⁸. Great Basin Pocket Mouse is known to consume seeds from some exotic plants and to utilize environments dominated by invasive Cheatgrass^{2, 19}, but both abundance and sprint velocity may be significantly reduced in Cheatgrass habitats^{19, 20}. Drought conditions may shorten the breeding season of this species leading to fewer litters in a year²¹. Great Basin Pocket Mouse did not experience any range shifts or contractions over an 80-yr period of increasing maximum summer temperature and precipitation in the Ruby Mountains of northeastern Nevada²², which may suggest that the species is less likely to be impacted by the effects of global warming than some other small mammal species. It is not known how potential extrinsic stressors might impact Great Basin Pocket Mouse in Wyoming.

KEY ACTIVITIES IN WYOMING

Great Basin Pocket Mouse is classified as a Species of Greatest Conservation Need by the Wyoming Game and Fish Department. In 2015, the University of Wyoming initiated a two-year graduate research project to better understand the distribution, occupancy, habitat, and diet partitioning of small mammals in the state, including Great Basin Pocket Mouse, through statewide surveys of pocket mice and other small mammals. Great Basin Pocket Mouse was

detected at several sites during the first season of trapping in 2015, and this project is already providing valuable information on the distribution and habitat associations of this species in Wyoming^{14, 15}.

ECOLOGICAL INFORMATION NEEDS

Great Basin Pocket Mouse is not well-studied in Wyoming, and little is known about the detailed distribution, abundance, natural history, or reproductive habits of this species in the state. As a rare, peripheral species, Great Basin Pocket Mouse would benefit from research to identify potential natural and anthropogenic disturbances to its already limited Wyoming distribution. Additional research will likely be necessary to re-establish subspecies designations for *P. mollipilosus* in Wyoming and across its distribution.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Nichole L. Bjornlie. Great Basin Pocket Mouse is assigned an NSSU rank because survey data that would provide for an assessment of population status are lacking. Consequently, priorities in Wyoming in the short-term will focus on addressing these data deficiencies. Of particular importance are data on population status and trends and a more refined understanding of distribution within the state. Because of the low density and patchy distribution of Great Basin Pocket Mouse on the landscape, acquiring these data will likely require targeted survey efforts. Additional priorities will focus on assessing limiting factors and habitat requirements, including the impact of invasive species, energy development, and other anthropogenic factors, which will ultimately be used to develop management and conservation recommendations.

CONTRIBUTORS

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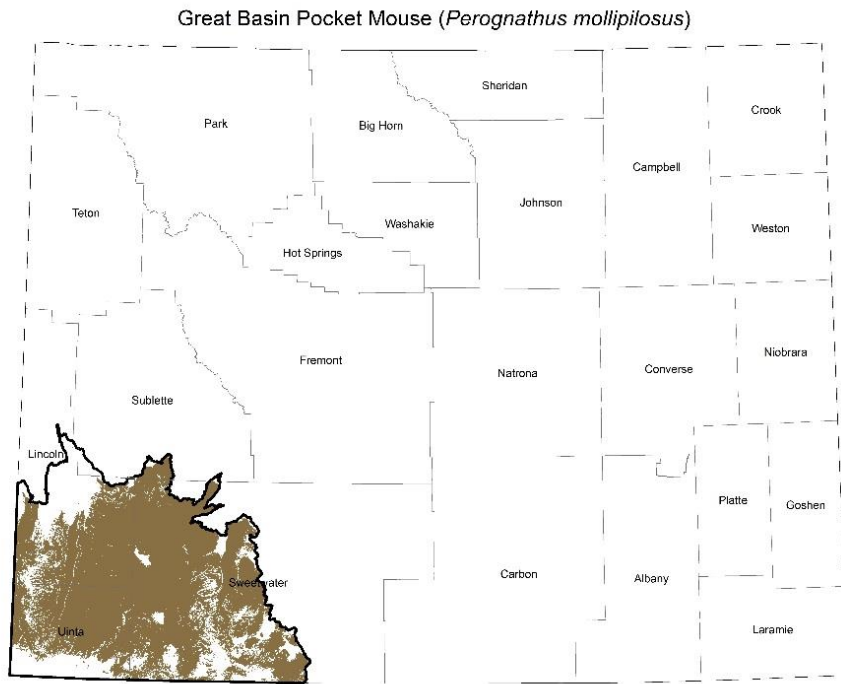
Figure 1: Great Basin Pocket Mouse captured in Uinta County, Wyoming. (Photo courtesy of Kristina M. Harkins)



Figure 2: North American range of Great Basin Pocket Mouse (*Perognathus parvus*) prior to the 2014 taxonomic split. New species boundaries for Great Basin Pocket Mouse (*P. mollipilosus*) and Columbia Plateau Pocket Mouse (*P. parvus*) have not yet been finalized. (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: Sagebrush shrubland habitat where Great Basin Pocket Mouse has been captured in Uinta County, Wyoming. (Photo courtesy of Kristina M. Harkins)



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.

Figure 4: Range and predicted distribution of *Perognathus mollipilosus* in Wyoming.