Plains Pocket Mouse

Perognathus flavescens

REGULATORY STATUS

USFWS: No special status
USFS R2: No special status
UWFS 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, S2S3
Wyoming contribution: LOW
IUCN: Least Concern

STATUS AND RANK COMMENTS

Plains Pocket Mouse (*Perognathus flavescens*) is assigned a range of state conservation ranks by the Wyoming Natural Diversity Database (WYNDD) due to uncertainty concerning the abundance, population trends, amount of occupied habitat, and extent of extrinsic stressors in Wyoming.

NATURAL HISTORY

Taxonomy:

Plains Pocket Mouse is a member of the family Heteromyidae, which includes the pocket mice and kangaroo rats [1]. There are 8 recognized subspecies of *P. flavescens*, but only *P. f. flavescens* occurs in Wyoming [2, 3]. One of the subspecies from the southwestern United States (*P. f. apache)* is sometimes viewed as a full species (*P. apache*) [4], but most authors now consider it a subspecies of *P. flavescens*, based in part on molecular phylogeny suggesting that *P. flavescens* and *P. apache* form a clade relative to *P. fasciatus* [5, 6].

Description:

Plains Pocket Mouse (like other pocket mice) is a small-bodied rodent with a relatively long tail and visible, external, fur-lined cheek pouches. It can be identified in the field, but positive identification can be difficult as it is similar in appearance to other sympatric congeners. Pelage color varies substantially across *P. flavescens* range, potentially driven by environmental characteristics such as soil color (e.g., those on black volcanic sands in Arizona have very dark fir) [5]. The tail is relatively short for a pocket mouse (i.e., 86–97% of the length of the head and body) [7] and is nonpenicillate (i.e., does not end in a tuft of hair) [2]. Plains Pocket Mouse is similar to Olive-Backed Pocket Mouse (*P. fasciatus*), which generally has darker, olivaceous dorsal pelage, and Silky Pocket Mouse (*P. flavus*), which has more conspicuous post-auricular patches [2].

Distribution & Range:
Wyoming is on the northwestern periphery of Plains Pocket Mouse range and represents < 5% of the species global range. It is thought to occur mainly in the southeastern portion of the state, but there are a few records from as far north as the southern Powder River Basin. There has been no apparent shift in the species range in Wyoming or globally, although there is limited formal survey data with which to confirm this. However, small mammal surveys across Wyoming's basins during 2015 recorded *P. flavescens* at only one of 14 sites within the species' purported range in Wyoming [8].

Habitat:
Plains Pocket Mouse is generally confined to areas of sandy or sandy-loam soils, whereas *P. flavus* and *P. fasciatus* can be found in drier and harder soils [2, 9]. It typically associates with either grassland or shrubland habitats, although it may also occur in agricultural fields [10]. In Wyoming, it seems to inhabit sand dunes, sagebrush-grassland, yucca-grassland, and grama grassland and generally occurs in areas with sandy or sandy-loam soil, sparse vegetation, and where the height of the dominant vegetation > 50 cm [11]. Plains Pocket Mouse burrows contain separate nesting and food storage areas. Burrows are generally plugged, and may have small entrance mounds (~ 10 cm diameter) that lead to tunnels < 2 cm diameter [2]. Activity is often restricted to areas near burrows, which contributes to small home ranges (0.02–0.05 ha) [2].

Phenology:
Plains Pocket Mouse is active from early April through late October over much of its range. It is considered a facultative hibernator, being torpid much of the winter and awakening periodically to feed on food cached in the burrow [2]. Breeding occurs from April to September, depending on location, and females often bear 2 litters of 2–7 young (usually 4–5) per year after a gestation of 21–25 days [2, 12]. Plains Pocket Mouse is largely nocturnal, only being active above ground at night, with activity being curtailed by moonlight [2].

Diet:
Plains Pocket Mouse is considered a granivore and, like other pocket mice, seeds are gathered in cheek pouches and cached within burrows [2]. Seeds of grasses seem to be important food sources, although seeds from a variety of forbs are also collected. Insects may be consumed when they are abundant or when seeds are scarce [5].

CONSERVATION CONCERNS

Abundance:
Continental: WIDESPREAD BUT PATCHY
Wyoming: UNCOMMON
There are no quantitative estimates of abundance for Plains Pocket Mouse in Wyoming or elsewhere. Relatively low capture rates on sites were they occur suggests that they may be fairly uncommon within their range in Wyoming [8]. Range-wide, the International Union for Conservation of Nature (IUCN) considers Plains Pocket Mouse to be patchily distributed [10], which is supported by some local studies [9]. Heritage Programs consider the species secure in much of the core range, but vulnerable or imperiled in the periphery of its range, including Wyoming, due primarily to restricted distribution and relatively low population sizes. Home ranges are small (0.02–0.3 ha) and generally contain one adult per burrow [2, 13], suggesting neither the potential for unusually high or low densities.

Population Trends:
Historic: UNKNOWN
Recent: UNKNOWN
There are no estimates of historic or recent population trends for Plains Pocket Mouse in Wyoming, or elsewhere. Range-wide, the IUCN classifies populations of Plains Pocket Mouse as stable [10]. Although not directly applicable to Wyoming, recent surveys in Nebraska found Plains Pocket Mouse to occur in localized, disjunct populations associated with suitable soil types throughout its historic range [9].

Intrinsic Vulnerability:
LOW VULNERABILITY
Plains Pocket Mouse does not apparently exhibit reproductive restrictions that would make it vulnerable, as they produce roughly 5 offspring per litter and can produce 2 or 3 litters per year in suitable climates [2]. Although moderately specialized to sandy grasslands, thus resulting in a relatively patchy distribution, habitat choice does not appear to be so restrictive as to make Plains Pocket Mouse particularly vulnerable. Given that it is a small mammal with a relatively small home range, dispersal ability may be limited, but there is no evidence that this is biologically restrictive.

Extrinsic Stressors:
MODERATELY STRESSED
Threats to Plains Pocket Mouse in Wyoming are largely speculative. It may be impacted by invasive species, as suggested by studies of other pocket mice that occurred at lower abundance at sites that had undergone invasions of nonnative plants [14]. Grasslands across the world, including Wyoming, have undergone similar invasions of nonnative plants. Habitats within Plains Pocket Mouse range in Wyoming are affected by agriculture, including cattle grazing and conversion to cropland, but it is unknown how these activities affect the species.

KEY ACTIVITIES IN WYOMING

The Wyoming Game and Fish Department has recently funded two studies relating (directly or indirectly) to Plains Pocket Mouse in Wyoming. First, from 2013–2015 the Wyoming Cooperative Fish and Wildlife Research Unit evaluated the impact of Cheatgrass (*Bromus tectorum*) on small mammal communities in Thunder Basin National Grassland [15]. Second, WYNDD initiated a study in 2015 to refine distributions, estimate occupancy rates, and assess habitat selection for several pocket mice species in the state [8, 16]. This project has an expected completion in 2017.

ECOLOGICAL INFORMATION NEEDS

Assessment of Plains Pocket Mouse status in Wyoming is hampered by limited information regarding distribution, habitat use, abundance, and population trends. Improved distribution and habitat information are necessary to develop refined estimates of potential impacts from development activities across Wyoming's basins. Better information on how Plains Pocket Mouse responds to events that reduce grass production and seed set in shrub-grasslands, including management practices and invasive plants, would be helpful. Estimates of abundance (and/or occupancy rates) are important to establish an accurate conservation rank and as a baseline for eventual population monitoring that can be used to assess trends over time.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Nichole L. Bjornlie. Plains 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 Plains Pocket Mice 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, which will ultimately be used to develop management and conservation recommendations.

CONTRIBUTORS

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Figure 1: A Plains Pocket Mouse in Goshen County, Wyoming. (Photo courtesy of Kristina M. Harkins)

Figure 2: North American range of *Perognathus flavescens*. (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: Plains Pocket Mouse habitat in Goshen County, Wyoming. (Photo courtesy of Kristina M. Harkins)

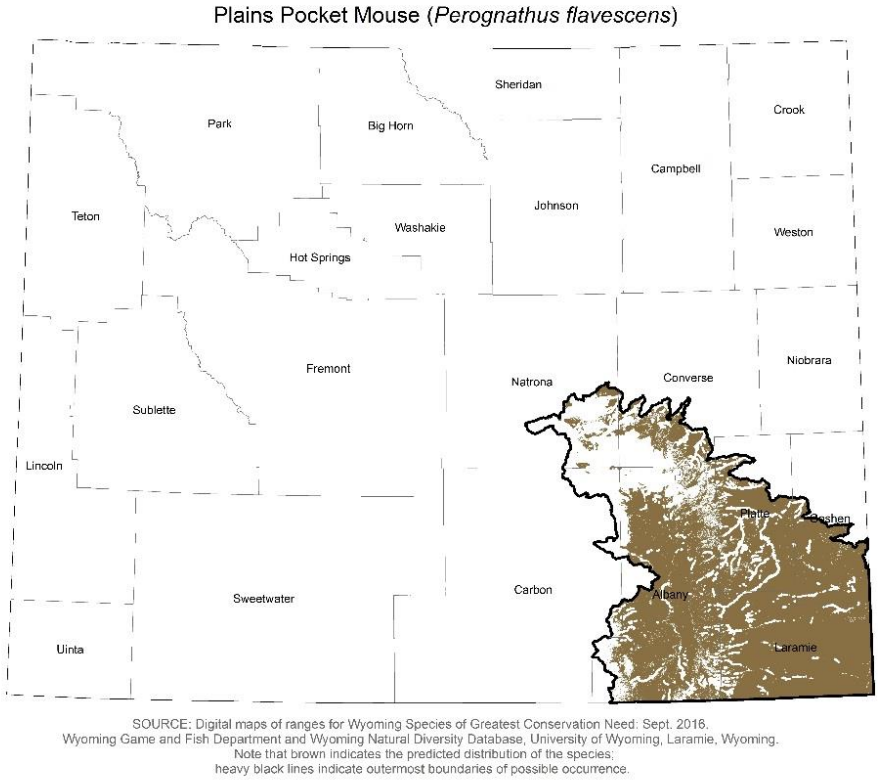

Figure 4: Range and predicted distribution of *Perognathus flavescens* in Wyoming.