

## Silky Pocket Mouse

*Perognathus flavus*

### **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, S2S4  
Wyoming contribution: LOW  
IUCN: Least Concern

### **STATUS AND RANK COMMENTS**

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

### **NATURAL HISTORY**

#### **Taxonomy:**

Silky Pocket Mouse is a member of the family Heteromyidae, which includes the pocket mice and kangaroo rats <sup>1</sup>. There are 14 recognized subspecies of *P. flavus*, two of which may occur in Wyoming: *P. f. piperi* and *P. f. bunkerii* <sup>2</sup>. Most, if not all, of Wyoming's Silky Pocket Mice are likely *P. f. piperi*, with *P. f. bunkerii* potentially occurring in small portions of extreme southeastern Wyoming. Recent genetic evidence reveals complexity in the sub-specific designations that may call some subspecies into question, but those results are not likely to affect the taxonomy of Wyoming animals <sup>3</sup>.

#### **Description:**

Silky Pocket Mouse is one of the smallest pocket mice in North America. As the name implies, the dorsal fur of Silky Pocket Mouse is long, soft (i.e., 'silky'), and pinkish-buff with blackish-tipped guard hairs, while the ventral fur and forelegs are white. Unlike other pocket mice in Wyoming, it has conspicuous postauricular patches of buff-colored fur that are usually twice the size of the ear and contrast markedly with the remainder of the dorsum <sup>2</sup>. *P. flavus* is similar to the Olive-backed Pocket Mouse (*P. faciatus*), but it has a shorter tail (often < 57 mm as opposed to 57–68 mm), has postauricular patches, and is generally smaller (< 115 mm total length as opposed to > 127 mm) <sup>4</sup>. *P. flavus* is also similar to Plains Pocket Mouse (*P. flavescens*), but it is darker due to black-tipped guard hairs, has more conspicuous postauricular patches (i.e., larger and contrasting more with dorsal pelage), and has a relatively shorter tail (i.e., roughly 86% of body length compared to > 90% in *P. flavescens*) <sup>2</sup>.

**Distribution & Range:**

Wyoming is on the northwestern periphery of Silky Pocket Mouse range. The species range in Wyoming may be greater than suggested by continental range maps, extending into Campbell and Weston counties, but Wyoming still represents < 5% of the species' global range. The range of *P. f. piperi*, the predominant subspecies in Wyoming, extends largely east from Wyoming into Nebraska, while *P. f. bunkerii* occurs largely south of Wyoming in Colorado, Kansas and Oklahoma. There has been no apparent shift in the species' range in Wyoming or globally, although there is no formal survey data with which to confirm this.

**Habitat:**

Silky Pocket Mouse seems to prefer valley bottoms with well-developed, often sandy or loamy soils. Preferred vegetative structure is generally a mix of weedy vegetation and shrubs<sup>2</sup> that is sometimes characterized as dry, sparse grassland<sup>5</sup>. In the core of its range (e.g., New Mexico), high densities occur in areas with sparse or clumped grass cover with considerable open spaces<sup>2</sup>. In Wyoming, Silky Pocket Mouse seems to occur over a range of grass-shrub communities, perhaps favoring short stature (< 25 cm) grama-needle grass and mixed sagebrush-grassland communities<sup>6</sup>. Silky Pocket Mouse may be more tolerant of habitat variation than other pocket mice, sometimes being found in rockier areas with harder soils<sup>2</sup>. Silky Pocket Mouse uses burrows throughout the year, and is thus restricted to areas with soil that will retain tunnels. Burrows are often constructed at the base of shrubs or other plants with persistent structure (e.g., yucca, cactus), usually have multiple entrances, and have a complex system of tunnels and rooms, including a central room, a nesting chamber, and multiple storage rooms.

**Phenology:**

Considering the whole range of the species, the breeding season of Silky Pocket Mouse extends from February through October, though there is strong geographic variation, and breeding in the northern portion of the range is likely much more restricted to summer months<sup>2</sup>. Females usually have a single litter of 2–6 young per year after a 26-day gestation, but second litters are possible under the right conditions, particularly in the south of its range. Young are weaned in about 28 days<sup>7</sup>. If spring and summer are sufficiently long with adequate food resources, young born in early spring may become sexually mature, and even reproduce, by late summer. Silky Pocket Mouse is active all winter long, but undergoes regular bouts of torpor in cool winter climates for a couple days at a time<sup>2</sup>. Winter activity is more restricted to burrows than other seasons, and although the species extensively caches foods in burrows, it may periodically forage above ground throughout the year. Silky Pocket Mouse is apparently very short-lived, with most individuals living only a few months; few live > 20 months and very few may live as long as 3 years<sup>2</sup>.

**Diet:**

Like other pocket mice, Silky Pocket Mouse is primarily a granivore, mostly consuming seeds of grasses and herbaceous plants and, to a lesser extent, the seeds of shrubs, with green vegetation and insects being occasional dietary components<sup>7</sup>. Silky Pocket Mouse relies on metabolic water from its food, and therefore does not require regular access to drinking water<sup>2</sup>. Silky Pocket Mouse may prefer smaller grass and weed seeds compared to the larger seeds of some grasses or shrubs<sup>2</sup>.

## **CONSERVATION CONCERNS**

### **Abundance:**

**Continental:** WIDESPREAD

**Wyoming:** RARE

There are no quantitative estimates of abundance for Silky Pocket Mouse across its range. Local population densities seem to fluctuate greatly among sites, seasons, and years. Reported density ranges  $\leq 53$  per hectare, but is typically on the order of 1–3 per hectare<sup>2, 8</sup>. In suitable habitat of the Southwest, *P. flavus* can be locally abundant relative to other species. For example, it represented the second and third most abundant species captured in two studies in southern Arizona<sup>8, 9</sup>. In Wyoming, abundance seems to be much lower, with studies reporting  $< 6$  captures per 1000 trap nights<sup>6</sup> and only 3 captures after several thousand nights of trapping in Thunder Basin National Grassland<sup>10</sup>. A recent statewide survey for pocket mice in Wyoming caught no Silky Pocket Mouse from roughly a dozen grassland sites within its range, despite using methods geared toward collecting pocket mice<sup>11</sup>, further suggesting that it may be a rare species in the state.

### **Population Trends:**

**Historic:** UNKNOWN

**Recent:** UNKNOWN

There are no estimates of historic or recent population trends for Silky Pocket Mouse in Wyoming, or elsewhere. The International Union for Conservation of Nature classifies populations of Silky Pocket Mouse as stable<sup>12</sup>, although there is no direct information to support this conclusion.

### **Intrinsic Vulnerability:**

LOW VULNERABILITY

Silky Pocket Mouse exhibits few restrictions that could make it vulnerable to disturbance. Although it has a very short life span (generally less than a year), it produces litters of 2–6 young and can reproduce multiple times per year under ideal conditions<sup>2</sup>. Although moderate specialization on grassland habitats results in a relatively patchy distribution, it does not appear to be so restrictive as to make Silky Pocket Mouse particularly vulnerable.

### **Extrinsic Stressors:**

MODERATELY STRESSED

Threats to Silky Pocket Mouse in Wyoming are largely speculative. It could be impacted by invasive species, particularly nonnative plants such as Cheat Grass (*Bromus tectorum*), as suggested by studies of other pocket mice<sup>9</sup>, and grasslands in Wyoming have been impacted by such invasions. Habitats within Silky Pocket Mouse range in Wyoming are affected by agriculture, including cattle grazing and conversion to cropland, but it is unclear how these activities affect the species. In Arizona, Silky Pocket Mouse was shown to respond positively to fire in un-grazed grasslands, hypothetically because it created a sparsely-structured habitat that was more conducive to pocket mice than other rodents<sup>5</sup>, although this pattern did not occur in the presence of grazing, suggesting potentially negative synergistic effects of grazing and fire. Climate change can cause shifts in Silky Pocket Mouse populations, as evidenced by long-term studies in Arizona where increased winter precipitation was linked with establishment of cool-season C3 woody shrubs at the expense of warm-season C4 grasses, resulting in a dramatic reduction in *P. flavus* abundance<sup>8</sup>. The extent to which any of these factors are actually affecting Silky Pocket Mouse populations in Wyoming is unclear.

## **KEY ACTIVITIES IN WYOMING**

The Wyoming Game and Fish Department has recently funded two studies relating (directly or indirectly) to Silky 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<sup>10</sup>. Second, WYNDD initiated a study in 2015 to refine distributions, estimate occupancy rates, and assess habitat selection for several species of pocket mouse in the state<sup>11, 13</sup>. This project has an expected completion in 2017.

## **ECOLOGICAL INFORMATION NEEDS**

Assessment of Silky Pocket Mouse status in Wyoming is hampered by limited information regarding its distribution, habitat use, abundance, and population trends. Improved distribution and habitat information are necessary to develop refined estimates of potential impact from development activities across Wyoming's basins. Better information on how Silky 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.* Silky 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 Silky 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 and energy development, which will ultimately be used to develop management and conservation recommendations.

## **CONTRIBUTORS**

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Figure 1: A Silky Pocket Mouse in the short-grass prairie of Logan County, Kansas. (Photo courtesy of Brian Zinke)



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

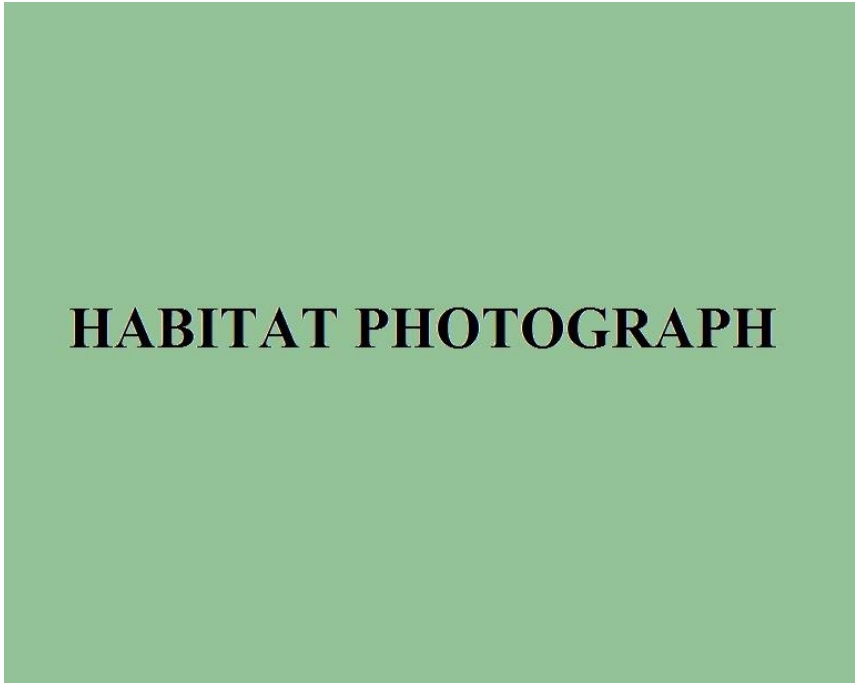


Figure 3: Photo not available.

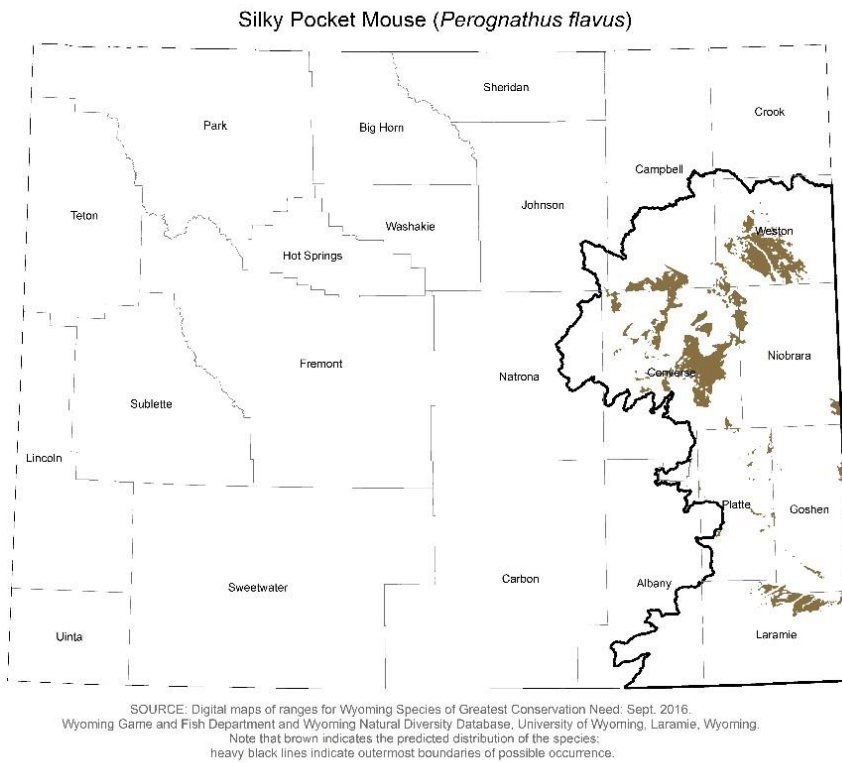


Figure 4: Range and predicted distribution of *Perognathus flavus* in Wyoming.