Preble's Shrew

Sorex preblei

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: G4, S2S3
Wyoming Contribution: LOW
IUCN: Least Concern

STATUS AND RANK COMMENTS

The Wyoming Natural Diversity Database has assigned Preble's Shrew (*Sorex preblei*) a state conservation rank ranging from S2 (Imperiled) to S3 (Vulnerable) because of uncertainty about population trends and extrinsic stressors for this species in Wyoming.

NATURAL HISTORY

Taxonomy:

There are no recognized subspecies of Preble's Shrew [1]. However, recent genetic analyses suggest the currently recognized *S. preblei* may be composed of > 1 cryptic species, with further analysis needed to confirm that possibility [2].

Description:

Preble's Shrew is an extremely small mammal, and is very similar in appearance to other Wyoming shrew species. Adult dimensions include body length 85–95 mm, tail length 35–36 mm, and weight 3–5 g. Like other *Sorex* species, Preble's Shrew has a relatively long and flexible snout, bicolored tail, proportionally small eyes, uniformly brownish or grayish fur on the back, and silvery-whitish fur below. Identification to species requires a combination of body measurements, skull measurements, and, especially, dental characteristics [1], which typically requires the individual shrew to be sacrificed. Figure 5 illustrates important differences in shrew dentition, and a technical key such as in Clark and Stromberg (1987) is an important aid in identifying Wyoming shrews to species [3].

Distribution & Range:

Preble's Shrew occurs from southwestern Canada across the western United States, extending from southern British Columbia and Saskatchewan south to Colorado and New Mexico [1, 4-6]. The species is known from the northwestern and southwestern corners of Wyoming. One specimen from southwestern Wyoming was first identified by experts as Masked Shrew (*S. cinereus*) and was amended to *S. preblei* only upon later re-examination [7]. Current understanding of the

species' entire distribution is based on rather few confirmed observations, and recent field surveys have broadened the known distribution substantially [8-10]. Of special note are the relatively recent confirmations of the species in New Mexico and Colorado [5, 6]. Given the relatively low sampling effort for shrews in Wyoming, the species may occupy more of the state than is currently documented.

Habitat:
Habitat associations of Preble's Shrew have not been extensively studied and are not well known. Captures of the species since 1992, including captures in Wyoming, have generally been in arid to semi-arid habitats such as sagebrush (*Artemisia* spp.) shrublands, subalpine shrublands characterized by manzanita (*Arctostaphylos* spp.), and grasslands [9, 11-13]. Historical records place the species in an array of habitats including marshes; riparian areas; openings in coniferous forests; and Lodgepole Pine (*Pinus contorta*), fir (*Abies* spp.) and Quaking Aspen (*Populus tremuloides*) forests [1]. Due to the difficulty of properly identifying *Sorex* shrews, some of these historical records may be misidentifications of species other than Preble's Shrew. In general, shrews are assumed to seek out certain microhabitats (e.g., specific litter depths, debris densities, or soil textures) that may not align well with traditional categories of wildlife habitat based on dominant overstory plants [14, 15].

Phenology:
Preble's Shrew is active year round. Breeding phenology is not well known but limited data suggest that females raise up to two litters per year which are likely born around June or July [16]. Based on information from other *Sorex* shrews, young may disperse at around 4 weeks of age.

Diet:
Preble's Shrew diet is likely similar to that of other *Sorex* shrews, with small invertebrates forming the bulk of consumed items [3]. Analysis of bite mechanics suggests Preble's Shrew may prefer soft-bodied over hard-bodied prey [1], but specific preferences and seasonal diet shifts are unknown.

CONSERVATION CONCERNS

Abundance:
Continental: WIDESPREAD
Wyoming: UNCOMMON
There are no population estimates of Preble's Shrew at continental, national, or state scales. The UNCOMMON abundance in Wyoming is inferred from the small portion of the state known to be occupied and an apparent rarity within that range [17]. However, sampling effort for shrews in the state has been so low that the species may actually extend beyond the currently-assumed range and may be common in some localities.

Population Trends:
Historic: UNKNOWN
Recent: UNKNOWN
Historic and recent population trends of Preble's Shrew are unknown. It is generally accepted that the recent expansion in confirmed captures and range extent are functions of increased sampling effort instead of actual population expansion.

Intrinsic Vulnerability:
MODERATE VULNERABILITY
Though little is known about Preble's Shrew, the general breeding biology of *Sorex* shrews makes them moderately vulnerable. Many *Sorex* have a life expectancy of one year, and under some conditions may produce only one litter per year. Also, limited mobility restricts shrew's ability to re-colonize suitable habitats and expand populations [3]. These characteristics may predispose *Sorex* populations to fragmentation and local extirpation if breeding is disrupted for even a single season [15]. Preble's Shrew populations may be somewhat insulated from such effects because they occupy a relatively broad range of habitats.

Extrinsic Stressors:
UNKNOWN
So little is known about Preble's Shrew in Wyoming that any outline of extrinsic threats is somewhat speculative. The species' relatively broad habitat use may protect populations from disturbances in any single habitat type. Additionally, shrews may rely on certain microhabitats that remain relatively unaffected by some large-scale disturbances, allowing populations to persist in otherwise disturbed areas.

KEY ACTIVITIES IN WYOMING

Preble's Shrew is classified as a Species of Greatest Conservation Need by the Wyoming Game and Fish Department (WGFD). Currently, there is no research being conducted on Preble's Shrew in Wyoming. In 2014 the WGFD funded and conducted an evaluation of the potential to use guard hairs to identify shrews to species, thus allowing for identification without the need to sacrifice individuals. However, only Western Water Shrew (*S. navigator*) was identifiable by guard hair, which is also the only shrew in Wyoming that is identifiable in hand [18].

ECOLOGICAL INFORMATION NEEDS

Very little is known about Preble's Shrew anywhere in the species' range. There are so few records of the species in Wyoming that basic distribution, habitat preferences, dietary needs, breeding phenology, and potential threats are poorly understood. A better estimate of actual distribution in the state may be the top priority information need at this time and could be efficiently generated as part of a larger field survey effort targeting multiple *Sorex* species simultaneously. In this context, it is important to note the recent documentation of the species in Colorado and New Mexico, ca. 400 miles distant from its previously assumed range boundary [5, 6].

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Nichole L. Bjornlie. Preble's Shrew is assigned an NSSU rank because survey data that would provide for an assessment of population status are lacking. Consequently, management priorities for the species in the short-term will focus on addressing these data deficiencies. Of particular importance are data on presence, distribution, population status and trends, habitat needs, and the impact of potential threats. Because shrews are rarely trapped as part of other small mammal projects, addressing these needs will require systematic surveys designed to target shrews (i.e., pitfall traps). However, these species would also benefit from the development of new capture and identification techniques that would not require sacrificing individuals. Results from these efforts will ultimately be used to update status and develop management and conservation recommendations.

CONTRIBUTORS

Gary P. Beauvais, WYNDD
Nichole L. Bjornlie, WGFD
Michael T. Wickens, WYNDD
Ian M. Abernethy, WYNDD
Douglas A. Keinath, WYNDD
Kaylan A. Hubbard, WYNDD

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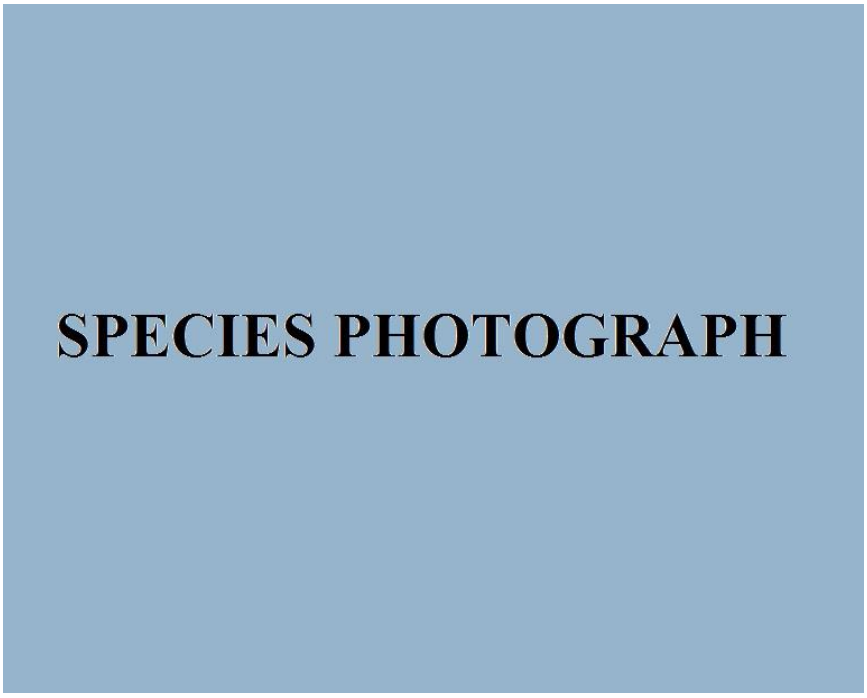

Figure 1: Photo not available.

Figure 2: North American range of *Sorex preblei* (Map from: Patterson, B. D., et al. (2007) Digital Distribution Maps of the Mammals of the Western Hemisphere, version 3.0, NatureServe, Arlington, Virginia.). This map does not show relatively recent confirmation of the species in New Mexico (Kirkland and Findley 1996) and Colorado (Long and Hoffmann 1992).

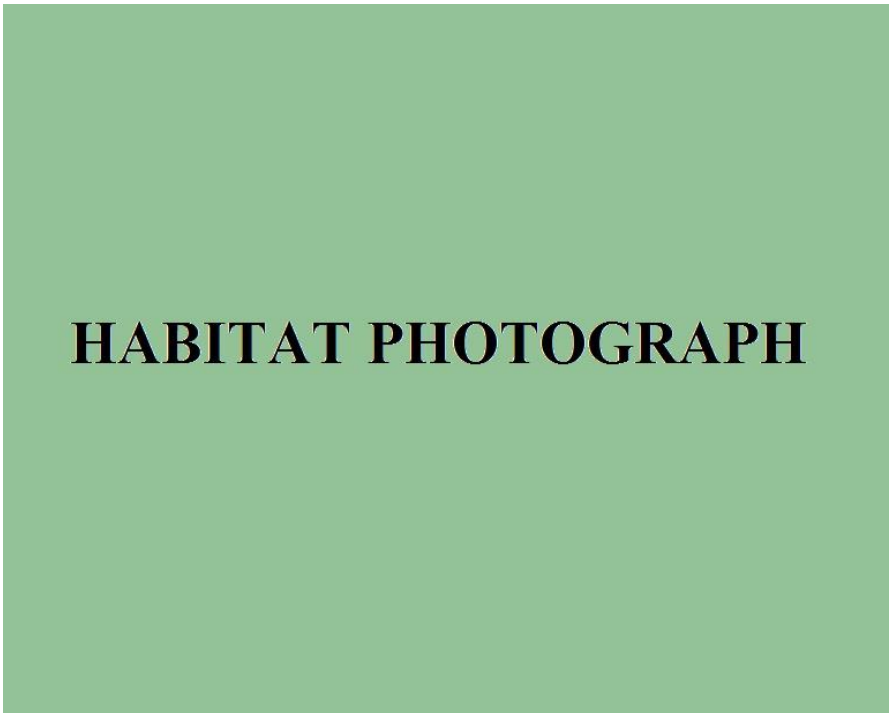

Figure 3: Photo not available.

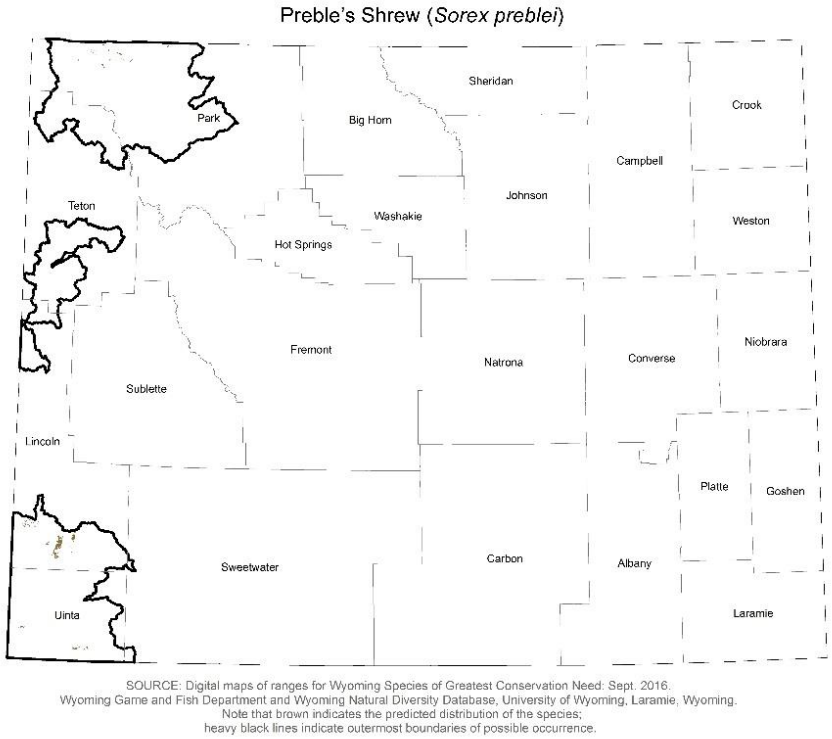

Figure 4: Range and predicted distribution of *Sorex preblei* in Wyoming.

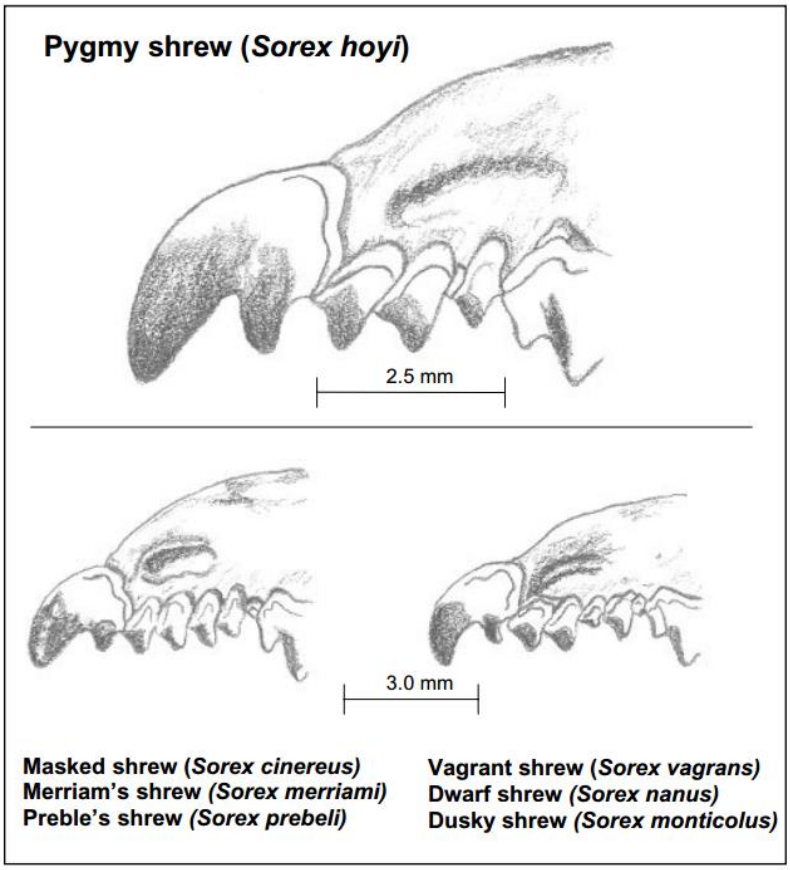

Figure 5: Lateral view of upper tooth rows of some *Sorex* spp. of shrew; Preble's Shrew shown on lower left. Top and bottom panels are not drawn to same scale – note scale bars. (Figure from: Beauvais, G. P., and McCumber, J. (2006) Pygmy Shrew (*Sorex hoyi*): a technical conservation assessment, p 34, USDA Forest Service, Rocky Mountain Region.)