Holarctic least shrew

Sorex minutissimus

Class: Mammalia Order: Eulipotyphla

Note: Previously recognized as Sorex yukonicus.

Review Status: Peer-reviewed **Version Date:** 20 November 2018

Conservation Status

NatureServe:	*Agency:*		
G Rank: G5	ADF&G:	IUCN: Least Concern	Audubon AK:
S Rank: S4	USFWS:	BLM:	

Final Rank

Conservation category: **V. Orange**

unknown status and either high biological vulnerability or high action need

Category	Range	Score
Status	-20 to 20	0
Biological	-50 to 50	-36
Action	-40 to 40	40

Higher numerical scores denote greater concern

Status

Variables measure the trend in a taxon's population status or distribution. Higher status scores denote taxa with known declining trends. Scores range from -20 (increasing) to 20 (decreasing).

Score

Population Trend in Alaska (-10 to 10) 0

Unknown.

Distribution Trend in Alaska (-10 to 10) 0

Trends over the last 50 years are unknown. Models suggest that the distribution of S. minutissimus in Alaska has increased since the Last Glacial Maximum (~21,500 years ago; Hope et al. 2015), but studies disagree as to whether distribution will increase (Hope et al. 2015) or contract (Baltensperger and Huettmann 2015a) by the end of this century.

Status Total: 0

Biological

Variables measure aspects of a taxon's distribution, abundance and life history. Higher biological scores suggest greater vulnerability to extirpation. Scores range from -50 (least vulnerable) to 50 (most vulnerable).

Score

Population Size in Alaska (-10 to 10) -4

Although S. minutissimus appears to be widespread, it is rare and occurs at low densities (Baltensperger and Huettmann 2015b; A. Hope, pers. comm.). We assume that at least 3,000 individuals occur in the state and rank this question as 0.5 * D + 0.5 * E.

Range Size in Alaska (-10 to 10) -10

Although few specimens have been collected from Alaska, S. minutissimus has been documented throughout much of the state including north of the Brooks Range, the Seward Peninsula, the eastern Alaska Peninsula, and interior Alaska east to Canada (MacDonald and Cook 2009; Hope 2012; Baltensperger and Huettmann 2015b; ARCTOS 2016). Estimated range is >400,000 sq. km. (Map 43, MacDonald and Cook 2009).

Population Concentration in Alaska (-10 to 10) -10

Does not concentrate.

Reproductive Potential in Alaska

Age of First Reproduction (-5 to 5) -5

< 2 years (Dokuchaev 2005; Hope et al. 2010).

Number of Young (-5 to 5) -3

Little is known about the reproductive ecology of this species in Alaska. Hanski (1984) suggest that litter size averages 4 to 5 young. In other parts of its range, females can have up to 3 litters per year (Dokuchaev 2005).

Ecological Specialization in Alaska

Dietary (-5 to 5) 1

Insectivorous. Little is known about the food habits of the least shrew in Alaska. In Russia and in Japan, stomach contents contained adult and larval insects (beetles, centipedes, moths) and spiders (Churchfield and Sheftel 1994; Churchfield et al. 1999; Namba and Ohdachi 2009; Ivanter et al. 2015). While the shrew's small size likely prevents it from taking bigger prey such as earthworms (Hanski 1984; Churchfield and Sheftel 1994), differences in diet among regions and habitats suggest that their diet is flexible and varies based on availability (Namba and Ohdachi 2009). Because invertebrates are an ephemeral and potentially unpredictable food source, we rank this question as B- Moderately adaptable with key requirements common.

Habitat (-5 to 5) -5

Has been found in several habitats, including riparian, tundra, shrublands, and a variety of forest types (Dokuchaev 1997; Peirce and Peirce 2000; Cook and MacDonald 2006; MacDonald and Cook 2009; Hope 2012).

Biological Total: -36

Action

Variables measure current state of knowledge or extent of conservation efforts directed toward a given taxon. Higher action scores denote greater information needs due of lack of knowledge or conservation action. Scores range from -40 (lower needs) to 40 (greater needs).	**Score**

Management Plans and Regulations in Alaska (-10 to 10) 10

Listed as unclassified game in Alaska with no bag limit and no closed season (ADFG 2018c).

Knowledge of Distribution and Habitat in Alaska (-10 to 10) 10

In the past few decades, surveys have considerably expanded our understanding of the least shrew's distribution in Alaska (Peirce and Peirce 2000; Cook and MacDonald 2006; Hope 2012; Baltensperger and Huettmann 2015b), underscoring just how little is known about this species' range in Alaska. Despite these efforts and the shrew's apparent widespread distribution, only 54 specimens have been collected as of 2016 (Cook et al. 2016).

Knowledge of Population Trends in Alaska (-10 to 10) 10

Not currently monitored.

Knowledge of Factors Limiting Populations in Alaska (-10 to 10) 10

S. minutissimus is rare across much of its global range (Churchfield et al. 1997; Cook and MacDonald 2006; Namba and Ohdachi 2009; Ivanter et al. 2015), making it difficult to study. Consequently, little is known about the ecology of this species and the factors which affects its population. As one of the smallest mammals in the world, researchers have wondered how the least shrew survives the winter and meets its energy requirements (Hanski 1984; Aitchison 1987). Shrews in general experience very low survival rates, likely due to starvation (Hanski 1984). Compared to other shrews, its small size (and thus lower food requirements) may allow it to occupy low-quality habitat (Churchfield et al. 1997). The impacts of climate change on this species' distribution is uncertain, with some models predicting a 15% range contraction by 2100 (Baltensperger and Huettmann 2015a), and others predicting relative stability (Hope et al. 2015). Historically, the least shrew has responded positively to warming periods by increasing its population (Hope 2012). Genetic analyses have also been conducted (Hope et al. 2010; Hope et al. 2013a; Ohdachi et al. 2012). Helminth parasites have been collected on individuals from the Yukon (Cook et al. 2016), but it is unknown whether these affect population dynamics.

Action Total: 40

Supplemental Information

Variables do not receive numerical scores. Instead, they are used to sort taxa to answer specific biological or management questions.

Harvest:	Not substantial
Seasonal Occurrence:	Year-round
Taxonomic Significance:	Monotypic species
% Global Range in Alaska:	<10%
% Global Population in Alaska:	<25%
Peripheral:	No

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