Cinereus shrew
*Sorex cinereus*

**Conservation Status**

<table>
<thead>
<tr>
<th>NatureServe:</th>
<th>G Rank: G5</th>
<th>Agency:</th>
<th>USFWS:</th>
<th>IUCN: Least Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>S Rank: S5</td>
<td>ADF&amp;G:</td>
<td></td>
<td></td>
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</tbody>
</table>

**Final Rank**

<table>
<thead>
<tr>
<th>Conservation category:</th>
<th>V. Orange</th>
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<tbody>
<tr>
<td>V = unknown status and either high biological vulnerability or high action need</td>
<td></td>
</tr>
</tbody>
</table>

- **Category** | Range | Score |
- Status: | -20 to 20 | 0 |
- Biological: | -50 to 50 | -42 |
- Action: | -40 to 40 | 32 |

*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. Status scores range from -20 (increasing) to 20 (decreasing).

- **Population Trend (-10 to 10)**
  - Unknown.
  - Status Total: 0

- **Distribution Trend (-10 to 10)**
  - Appears to have expanded its distribution northward into tundra habitats (Hope et al. 2013a), but its distribution at the southern end of its range is unknown. While this northward shift is expected to continue, models disagree whether its overall distribution in Alaska will expand (Hope et al. 2013a; 2015) or contract (Baltensperger and Huettmann 2015a; Marcot et al. 2015).
  - Status Total: 0

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

- **Population Size (-10 to 10)**
  - Common and abundant throughout the state (Cook and MacDonald 2006; Baltensperger and Huettmann 2015b). Extensive field surveys across Alaska consistently recorded S. cinereus as the dominant small mammal species (Cook and MacDonald 2006; Baltensperger and Huettmann 2015b), and more than 13,500 specimens have been collected in Alaska in the past 120 years (ARCTOS 2016). We therefore assume that population size is >25,000 individuals.
  - Score: -10

- **Range Size (-10 to 10)**
  - Found throughout Alaska from the Arctic tundra to southeast Alaska, and from the Canadian border west to the Alaska Peninsula (MaDonald and Cook 2009; Baltensperger and Huettmann 2015b; ACCS 2017a). Present-day species distribution models estimated a range size >2,000,000 sq. km. (Hope et al. 2013).
  - Score: -10

- **Population Concentration (-10 to 10)**
  - Does not concentrate.
  - Score: -10

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

Number of Young (-5 to 5)
Unknown for Alaska. Elsewhere in North America, females have an average litter size of 7 young and have two or three litters per year (Whitaker 2004; Osborne 2008).

Ecological Specialization

Dietary (-5 to 5)
Like other shrews, S. cinereus is an insectivore with a varied, yet largely carnivorous diet (Aitchinson 1987; Whitaker 2004; O’Brien et al. 2018). 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)
Although S. cinereus is often characterized as living in moist boreal habitats (Demboski and Cook 2003; Hope et al. 2015), it has been reported from a variety of habitats including deciduous forests, open and closed shrub, meadows, wetlands, and tundra (Aitchinson 1987; Whitaker 2004; Cook and MacDonald 2006; Hope 2012; Hope et al. 2013a; Baltensperger and Huettmann 2015b).

Biological Total: -42

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. Action scores range from -40 (lower needs) to 40 (greater needs).

Management Plans and Regulations (-10 to 10)
Listed as unclassified game in Alaska with no bag limit and no closed season (ADFG 2018c).

Knowledge of Distribution and Habitat (-10 to 10)
General distribution and habitat associations are known from multi-species small mammal surveys that have been conducted across the state (e.g. Tegeler and Savage 2003; Cook and MacDonald 2006; Hope 2012; Baltensperger and Huettmann 2015b; ARCTOS 2016). Surveys are needed to determine whether S. cinereus occurs on the Aleutian Islands west of Unimak Pass (MacDonald and Cook 2009). Moreover, S. cinereus has been expanding its range northward into tundra habitats in recent decades; the northernmost extent of its range therefore warrants further investigation (MacDonald and Cook 2009; Hope et al. 2013a). Additional surveys and specimen collections are needed to study the genetic diversity of insular populations and subspecies S. c. streatori and S. c. hollisteri.

Knowledge of Population Trends (-10 to 10)
Not currently monitored.

Knowledge of Factors Limiting Populations (-10 to 10)
Little is known about the factors that limit S. cinereus populations in Alaska. Climate change is expected to expand the range of the cinereus shrew northward (Hope et al. 2013a; Baltensperger and Huettmann 2015a; Hope et al. 2015), but models disagree as to whether its overall range in Alaska will increase (Hope et al. 2013a; Hope et al. 2015) or decrease (Baltensperger and Huettmann 2015a). In addition to distributional changes, climate change may increase food availability. A correlative study suggests that observed increases in body size may result from increased winter food availability caused by warming temperatures (Yom-Tov and Yom-Tov 2005); however, this idea has not been explicitly tested. In addition, while strong dietary overlap between S. cinereus and S. monticolus indicates the potential for competition (O’Brien et al. 2018), it is unknown whether food is limiting and whether competition actually takes place between these two species. It is unknown whether S. cinereus undergoes population fluctuations in Alaska, as is common in other small mammals. A long-term monitoring project on the Alaska Peninsula observed a two-year cycle from 1996 to 2000, but subsequent data contradicted this pattern (Savage 2003). Dramatic population fluctuations have been observed elsewhere in this species’ range, though the causal mechanisms are unknown (Buckner 1966). Endo- and ectoparasites have been documented (e.g. Murrell et al. 2003; Cook et al. 2016), but their role on population dynamics has not been investigated. Several studies have investigated the relationship between S. cinereus and other shrew species (van...
Zyll de Jong 1982; Demboski and Cook 2003; Hope et al. 2012), but additional studies are needed on subspecies
designations, of which two are recognized in Alaska (MacDonald and Cook 2009). Specimens collected across
Alaska (Demboski and Cook 2003) and across their western range (Hope et al. 2012) appear weakly
differentiated from each other.

Supplemental Information - variables do not receive numerical scores. Instead, they that are used to sort taxa to answer specific
biological or managerial questions.

<table>
<thead>
<tr>
<th>Harvest:</th>
<th>Not substantial</th>
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<tr>
<td>Seasonal Occurrence:</td>
<td>Year-round</td>
</tr>
<tr>
<td>Taxonomic Significance:</td>
<td>Monotypic species</td>
</tr>
<tr>
<td>% Global Range in Alaska:</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>% Global Population in Alaska:</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>Peripheral:</td>
<td>No</td>
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</tbody>
</table>

References

online: http://aknhp.uaa.alaska.edu/apps/wildlife

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Baltensperger, A. P., and F. Huettmann. 2015a. Predicted shifts in small mammal distributions and biodiversity in the
DOI: 10.1371/journal

Baltensperger, A. P., and F. Huettmann. 2015b. Predictive spatial niche and biodiversity hotspot models for small
DOI: 10.1007/s10980-01


Beringian Coevolution Project: Holistic collections of mammals and associated parasites reveal novel perspectives on
evolutionary and envir


DOI: 10.1016/j.ympev.20


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Alaska Center for Conservation Science
Alaska Natural Heritage Program
University of Alaska Anchorage
Anchorage, AK