

Arctic ground squirrel

Urocitellus parryii

Class: Mammalia

Order: Rodentia

Conservation Status

NatureServe:

G Rank: G5

S Rank: S5

Agency:

USFWS:

ADF&G: Species of Greatest Conservation Need

IUCN: Least Concern

| Final Rank | | |
|---|--------------|--------------|
| Conservation category: V. Orange | | |
| V = unknown status and either high biological vulnerability or high action need | | |
| <u>Category</u> | <u>Range</u> | <u>Score</u> |
| Status: | -20 to 20 | 0 |
| Biological: | -50 to 50 | -40 |
| Action: | -40 to 40 | 4 |
| 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).

| | Score |
|--|-------|
| <i>Population Trend (-10 to 10)</i> | 0 |
| Unknown. | |
| <i>Distribution Trend (-10 to 10)</i> | 0 |
| Trends for the last 50 years are unknown. Modeling studies estimate that the distribution of <i>U. parryii</i> in Alaska has increased since the Last Glacial Maximum (~21,500 years ago; Hope et al. 2015), but distribution is expected to decrease by the end of this century (Hope et al. 2015; 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).

| | Score |
|--|-------|
| <i>Population Size (-10 to 10)</i> | -6 |
| Unknown, but suspected large. Arctic ground squirrels are widely distributed in Alaska and are "locally abundant over much of [their] range" (MacDonald and Cook 2009). | |
| <i>Range Size (-10 to 10)</i> | -10 |
| Found throughout most of Alaska from Wrangell-St. Elias National Park north to the North Slope and from the Canadian border west to western Alaska and the Aleutian Islands (MacDonald and Cook 2009; Cook et al. 2010). This species has a restricted distribution in southeast Alaska and its distribution in Prince William Sound is unknown (MacDonald and Cook 2009). Estimated range size is >400,000 sq. km., based on range map from ACCS (2017a). | |
| <i>Population Concentration (-10 to 10)</i> | -10 |
| Population does not aggregate at specific locations. Lives in small colonies of up to 50 members (Batzli and Sobaski 1980; Wheeler and Hik 2013). | |
| <i>Reproductive Potential</i> | |
| <u>Age of First Reproduction (-5 to 5)</u> | -5 |

| | |
|---|--------------|
| Reaches sexual maturity within 1 year of birth (Carl 1971; Sheriff et al. 2011). | |
| <u>Number of Young (-5 to 5)</u> | 1 |
| Females have one litter per year (McLean 2018). Average litter size in Alaska and southwestern Yukon range from 3 (Gillis et al. 2005) to 6.1 (Carl 1971; reviewed in McLean 2018). | |
| <i>Ecological Specialization</i> | |
| <u>Dietary (-5 to 5)</u> | -5 |
| Consumes a variety of herbaceous plants and fungi, but opportunistically eats invertebrates, small mammals, bird eggs, and carrion (Cade 1951b; Batzli and Sobaski 1980; McLean 1985; Boonstra et al. 1990; Pollom et al. 2015; Hobbie et al. 2017). Hobbie et al. (2017) compared the diets of Arctic ground squirrels at two locations in Alaska and found important differences between study sites and suggested that ground squirrels have a flexible diet that changes with food availability. Similarly, Batzli and Sobaski (1980) noted seasonal differences in diet consistent with the availability of herbaceous plants. | |
| <u>Habitat (-5 to 5)</u> | -5 |
| Found in a variety of habitats including tundra, shrublands, alpine meadows, sand dunes, and by lakes and rivers where the ground is favorable for digging burrows (Carl 1971; Batzli and Sobaski 1980; Cook and MacDonald 2006; MacDonald and Cook 2009; Hobbie et al. 2017). Populations in the Yukon Flats inhabit open forest habitats such as early-succession stands, old burns, and riverbanks (Guthrie 1967). | |
| Biological Total: | -40 |
| <hr/> | |
| 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). | Score |
| <hr/> | |
| <i>Management Plans and Regulations (-10 to 10)</i> | -10 |
| Listed as unclassified game in Alaska with no closed season or bag limits; however, the hide or meat must be salvaged for human use (ADFG 2018c; ADFG 2018d). | |
| <i>Knowledge of Distribution and Habitat (-10 to 10)</i> | 2 |
| Distribution is well-known in central and northern Alaska (MacDonald and Cook 2009; ARCTOS 2016), with knowledge of habitat associations (e.g. Guthrie 1967; Batzli and Sobaski 1980; Cook and MacDonald 2005; 2006; Barker and Derocher 2010). However, its distribution in other areas has not been well-documented e.g. southeast and southcoastal Alaska south of the Seward Peninsula (MacDonald and Cook 2009). Additional studies and specimens are needed to validate subspecies designations and determine range extents and overlap (Eddingsaas et al. 2004; Cook et al. 2010; Galbreath et al. 2011; McLean et al. 2016). | |
| <i>Knowledge of Population Trends (-10 to 10)</i> | 10 |
| Not currently monitored. | |
| <i>Knowledge of Factors Limiting Populations (-10 to 10)</i> | 2 |
| Research on Arctic ground squirrels in Alaska has largely focused on torpor, hibernation, and burrowing activity (e.g. Buck and Barnes 1999; Long et al. 2005; Sheriff et al. 2011; Williams et al. 2012; Sheriff et al. 2013; Williams et al. 2014b; Lee et al. 2016). In the Yukon, studies on population dynamics have focused on colonies living in forested habitats (e.g. Hubbs and Boonstra 1997; Byrom et al. 2000; Karels and Boonstra 2000; Karels et al. 2000; Werner et al. 2015). Food availability and predation limit these populations (Hubbs and Boonstra 1997; Byrom et al. 2000; Karels et al. 2000; Werner et al. 2015), though density-dependent factors also affect overwinter survival (Karels and Boonstra 2000). Forest colonies in the Yukon collapsed in the early 2000s and have not recovered; predation was the main reason for their initial collapse (as ground squirrels in this system become the main prey species during the low phase of the snowshoe hare cycle; Krebs et al. 2014b) and has also prevented their recovery (Werner et al. 2015). Forest habitats are considered unusual and low-quality habitats for ground squirrels (Gillis et al. 2005; Donker and Krebs 2011) and the dynamics of these colonies vary markedly from tundra colonies in the same region (Werner et al. 2015; McLean 2018). | |
| Comparatively fewer studies have considered the factors that regulate populations in higher-quality tundra habitats. Additional research is needed to determine the role of competition, food availability, and burrow | |

availability on populations (Carl 1971; Batzli and Sobaski 1980; Wheeler and Hik 2013). In the Yukon, Green (1977) noted that starvation is likely an important factor for overwinter survival, while dispersal of juveniles was the greatest contributor to local dynamics in the summer. Juvenile survival may be particularly low in some areas (McLean 2018), but to our knowledge data for Alaska are not available.

As a northern specialist, the Arctic ground squirrel is thought to be vulnerable to climate change (reviewed in Wheeler and Hik 2013; Werner et al. 2015; Wheeler et al. 2015) and species distribution models predict a loss of suitable habitat by the end of this century (Hope et al. 2015; Marcot et al. 2015).

Action Total: 4

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

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

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