

Northern Bog Lemming (*Synaptomys borealis*)

Conservation Status Rank Summary

October 9, 2024

For details on assessment and ranking methodology, see: [Conservation Status Assessment Definitions, Process, Rank Factors, and Calculation of State Ranks for Montana Species](#)

Rarity and Trends

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Rarity					
Range Extent	2024-09-12	Y: 60690.7 km ²	3.930	MTNHP Range Maps	None
Area of Occupancy	2024-09-12	248 4km ² cells	3.440	MTNHP Modeling	None
Number of Occurrences	2024-09-12	33	2.750	MTNHP Databases	None
Population Size			-		Factor not used in ranking.
# of Occurrences in Good Condition	2024-09-12	0	0.000	Expert Opinion	The montane wetlands used by the species are highly threatened by drought, fire, and other symptoms of our changing climate
% of Area Occupied in Good Condition			-		Factor not used in ranking.
Environmental Specificity	2018-09-26	Very narrow	-	MTNHP Species Rank Data Table	Factor not used in ranking. Found only in bogs and fens with a sphagnum moss component Methodology: NS (2003) Original Score: A
Rarity is calculated by averaging weighted factor scores: $((3.93 \times 1) + (3.44 \times 2) + (2.75 \times 1) + (0.00 \times 2)) / 6 = 2.26$					
Trends					
Short-term Trend	2018-09-26		-	MTNHP Species Rank Data Table	Factor not used in ranking. No data on trends available. Although sites have been revisited, given the variety of survey methods used and low capture rates, it is difficult to assess trend with confidence Methodology: NS (2003) Original Score: U
Long-term Trend	2018-09-26		-	MTNHP Species Rank Data Table	Factor not used in ranking. Species has been captured so infrequently, it is difficult to say what the long-term trend in population is. Methodology: NS (2003) Original Score: U
No trend data used in ranking this species					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		High	1.830		None
Intrinsic Vulnerability	2018-09-26	Highly vulnerable	-	MTNHP Species Rank Data Table	Factor not used in ranking. Although the species has high fecundity, it has specific habitat requirements and fragmentation could make dispersal difficult and recovery of locally extirpated populations impossible. Methodology: NS (2003) Original Score: A
Threat score is calculated from Overall Threat Impact when available or Intrinsic Vulnerability if not: (1.83) = 1.83					

Individual Threats Data

Threat Category	Date Assessed	Impact Score	Scope	Severity	Immediacy	Comments
Climate Change & Severe Weather	2024-09-12	High	Pervasive	Serious	High	As a glacial relic, species faces significant threats from habitat loss due to ongoing climate change and impacts to montane wetlands
Threat Tally: 0 - Very High, 1 - High, 0 - Medium, 0 - Low Overall Threat Impact* = High						

*See [Conservation Status Assessment Definitions, Process, Rank Factors, and Calculation of State Ranks for Montana Species](#) for calculation of Overall Threat Impact based on the number and impact of individual threats.

Conservation Status Rank Calculation

Raw score

Rarity: $(2.26 \times 70\%)$ + Threats: $(1.83 \times 30\%)$ + Trends: $(0.00) = 2.13$

Calculated Rank: S2

Accepted Rank	S2
Date Approved	2018-09-26
Approval Authority	Montana Species of Concern Committee
Rank Justification	Although populations of this species exist across much of western Montana, most appear isolated due to the species-specific habitat requirements and total area occupied is relatively small. Species faces significant threats to persistence from degradation of wetland habitats and isolation of populations that increase risk of local extirpation.

Supplementary Information

Montana Natural Heritage Program. 2021. Conservation Status Assessment Definitions, Process, Rank Factors, and Calculation of State Ranks for Montana Species. 18 p.

https://mtnhp.mt.gov/docs/Montana_State_Rank_Criteria_20211201.pdf

Montana Field Guide Species Account:

<https://fieldguide.mt.gov/speciesDetail.aspx?elcode=AMAFF17020>

Predicted Suitable Habitat Model:

<https://mtnhp.mt.gov/resources/models/?elcode=AMAFF17020>

Information Needs

Information needs are assessed by considering the availability of factors used to assess species status as well as the quality of these assessments. Current information availability and quality to inform Conservation Status Rank for this species are highlighted.

Rank Factor	Assessment Category	Value	Criteria
General Status	Status Quality	Adequate	Calculated rank has low uncertainty and is represented by a single rank (e.g. S3); accepted rank may be adjusted to a range rank (e.g. S2S3)
		Poor	Rank assessed as SU or calculated rank has notable uncertainty and corresponds to a range rank with 2 or more values (e.g. S2?, S1S3, or S4S5)
Rarity	Range Quality	Adequate	Range polygon adequately represents area of probable occupancy and does not include substantial unoccupied areas; range may be adequately defined and still include areas of unsuitable habitat (e.g. mountain ranges for plains species)
		Marginal	Range polygon defined, but may include or exclude notable areas where the species may or may not occur on the landscape
		Poor	Range polygon not defined
	Habitat Quality	Adequate	Species-habitat relationship is well-defined (e.g. relevant literature or robust habitat model available)
		Marginal	Understanding of species-habitat relationship is adequate among some but not all habitats (e.g. literature covers similar habitats outside of Montana or habitat model performance is only somewhat adequate)
		Poor	Species-habitat relationship is not well understood
Threats	Threat Quality	Adequate	Threat Impact is a single value (including "Unthreatened")
		Marginal	Threat Impact assessed at more than one value (e.g. "High - Medium")
		Poor	Threat Impact is Unknown but Intrinsic Vulnerability is assessed
		Unknown	Threat Impact is Unknown and Intrinsic Vulnerability is not assessed
Trends	Recency	Current	Short-term Trend assessment date less than 10 years old
		Out of Date but Adequate	Short-term Trend assessment date is more than 10 years old or Unknown, but species is Unthreatened
		Out of Date	Short-term Trend assessment date more than 10 years old
		Not Available	Short-term Trend data are not available
	Trend Quality	Sufficient	Short-term Trend assessed at a single value or multiple values with a minimum trend greater than -10% (stable or increasing)
		Unknown but Sufficient	Short-term Trend is Unknown, but species is Unthreatened
		Poor	Short-term Trend is less than -10% (in decline) with two or more values selected
		Unknown	Short-term Trend is Unknown

Summary of Information Availability

Species had a defined range polygon and is monitored at known sites. Presence at sites outside of the current range boundary and in other habitats is poorly studied. No data on trend exist.

Summary of Information Needs

Continued monitoring of historically occupied sites is needed to establish trend in the core of the species range. Exploration of potentially suitable habitat within and in areas adjacent to the species range will provide more certainty on range boundaries and habitat associations.