Common Muskrat (*Ondatra zibethicus*)
Conservation Status Rank Summary

September 24, 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	2024-03-13	Y: 380530.8 km²	4.710	MTNHP Range Maps	None
Area of Occupancy	2024-09-10	9032 | 4km² cells	4.810	MTNHP Modeling	None
Number of Occurrences			-		**Factor not used in ranking.**
Population Size			-		**Factor not used in ranking.**
# of Occurrences in Good Condition			-		**Factor not used in ranking.**
% of Area Occupied in Good Condition			-		**Factor not used in ranking.**
Environmental Specificity	2018-05-03	Broad	-	MTNHP Species Rank Data Table	**Factor not used in ranking.** Found in lentic and lotic waterbodies across a diversity habitats | Methodology: NS (2003) | Original Score: D
Rarity is calculated by averaging weighted factor scores: **((4.71 × 1) + (4.81 × 2)) / 3 = 4.78**					
Trends					
Short-term Trend	2024-03-15		[-0.500, -0.220]	Kluge 2023	Kluge (2003) reports a 5 fold decrease in muskrat harvest within the state and recent poor recruitment. The magnitude of population change is still uncertain but this likely represents >50% decline in the last decade
Long-term Trend	2024-03-15		[-0.220, 0.000]		Across NA Muskrat populations have declined by up to 90% in some areas. The long-term trend in Montana is not well studied. Creation of reservoirs in some areas has likely increased habitat, but loss and degradation of wetlands may have decreased habitat in other areas.
Trends score is calculated by summing weighted short and long-term trend scores: **(([-0.50, -0.22] × 2) + ([-0.22, 0.00] × 1)) = [-1.22, -0.44]**					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		Unknown	-		Factor not used in ranking.
Intrinsic Vulnerability	2018-05-03	Not intrinsically vulnerable	5.500	MTNHP Species Rank Data Table	Not Intrinsically Vulnerable. Species matures quickly, reproduces frequently, and/or has a high fecundity such that populations recover quickly (5 years or 2 generations) from decreases in abundance. Species has good dispersal capabilities such that e | Methodology: NS (2003) | Original Score: C
Threat score is calculated from Overall Threat Impact when available or Intrinsic Vulnerability if not: **(5.50) = 5.50**					

Individual Threats Data

Threat Category	Date Assessed	Impact Score	Scope	Severity	Immediacy	Comments
No individual threats data used in ranking this species						

Conservation Status Rank Calculation

Raw score

Rarity: (4.78 × 70%) + Threats: (5.50 × 30%) + Trends: ([-1.22, -0.44]) = [3.77, 4.55]

Calculated Rank: S4?

Accepted Rank	S4
Date Approved	2024-12-18
Approval Authority	MTNHP
Rank Justification	Species is common in wetland habitats state-wide. Threats are not well described but the species is declining in other regions of North America. Trend is unknown.

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=AMAFF15010

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=AMAFF15010

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

Data to assess status are generally available, but threats are poorly understood.

Summary of Information Needs

Species appears to be declining within and outside of Montana. Research to better understand threats to the species and causes of these declines would provide better information to understand the status within the state.

Additional Threat Details

The table below contains the complete threats assessment for this species. While the Conservation Status Rank Calculation is based on cumulative, broadly categorized (Level 1) threats data, threats are assessed and tracked for more specifically categorized (Level 2) threats when available.

Threat Category	Date Assessed	Assessed By	Data Source	Scope	Severity	Imme-diacy	Comments
Invasive & Other Problematic Species, Genes & Diseases - 8	2024-03-13	Dan Bachen	None	Pervasive	Unknown	High	Declines of muskrat populations have been documented. Causes are unknown but some declines are likely from disease. However the specific pathogen is not recognized (Ganoe et al. 2020).
No threats data available for this species							