Deepwater Sculpin (*Myoxocephalus thompsonii*)
Conservation Status Rank Summary

February 16, 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	2024-02-14	Y: 118.4 km²	0.790	MTNHP Range Maps	None
Area of Occupancy			-		*Factor not used in ranking.*
Number of Occurrences	2024-02-14	1	0.000	MTNHP Databases	None
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			-		*Factor not used in ranking.*
Rarity is calculated by averaging weighted factor scores: **((0.79 × 1) + (0.00 × 1)) / 2 = 0.40**					
Trends					
Short-term Trend	2024-02-14		0.070	Expert opinion	There is no known trend information from the Waterton Lake population, but no observed, inferred, or predicted decline is known (COSEWIC 2017), there are ongoing declines in the Great Lakes, but the threats there (quagga mussels, round goby, etc.) are not known to currently impact Waterton Lake)
Long-term Trend	2024-02-16		0.070	Expert Opinion based on MTNHP data	Long term trend has to be regarded as stable given that Waterton Lake has not been altered much since arrival of Europeans.
Trends score is calculated by summing weighted short and long-term trend scores: **((0.07 × 2) + (0.07 × 1)) = 0.21**					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		Low/No Threats	5.500		No threats identified in Montana.
Intrinsic Vulnerability			-		*Factor not used in ranking.*
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
Invasive & Other Problematic Species, Genes & Diseases	2024-02-16	Low	Pervasive	Slight	High	9/10 fishes sampled had the parasite (a tapeworm; Carney et al. 2009), but mortality associated with the parasite (if any) is unknown.
Threat Tally: 0 - Very High, 0 - High, 0 - Medium, 1 - Low Overall Threat Impact* = Low/No Threats						

*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: (0.40 × 70%) + Threats: (5.50 × 30%) + Trends: (0.21) = 2.14

Calculated Rank: S2

Accepted Rank	SU
Date Approved	2024-09-30
Approval Authority	Montana Species of Concern Committee
Rank Justification	Species is known from a single observation in one waterbody.

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=AFC4E04020

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=AFC4E04020

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)
General Status	Status Quality	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)
Rarity	Range Quality	Marginal	Range polygon defined, but may include or exclude notable areas where the species may or may not occur on the landscape
Rarity	Range Quality	Poor	Range polygon not defined
Rarity	Habitat Quality	Adequate	Species-habitat relationship is well-defined (e.g. relevant literature or robust habitat model available)
Rarity	Habitat Quality	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)
Rarity	Habitat Quality	Poor	Species-habitat relationship is not well understood
Threats	Threat Quality	Adequate	Threat Impact is a single value (including "Unthreatened")
Threats	Threat Quality	Marginal	Threat Impact assessed at more than one value (e.g. "High - Medium")
Threats	Threat Quality	Poor	Threat Impact is Unknown but Intrinsic Vulnerability is assessed
Threats	Threat Quality	Unknown	Threat Impact is Unknown and Intrinsic Vulnerability is not assessed
Trends	Recency	Current	Short-term Trend assessment date less than 10 years old
Trends	Recency	Out of Date but Adequate	Short-term Trend assessment date is more than 10 years old or Unknown, but species is Unthreatened
Trends	Recency	Out of Date	Short-term Trend assessment date more than 10 years old
Trends	Recency	Not Available	Short-term Trend data are not available
Trends	Trend Quality	Sufficient	Short-term Trend assessed at a single value or multiple values with a minimum trend greater than -10% (stable or increasing)
Trends	Trend Quality	Unknown but Sufficient	Short-term Trend is Unknown, but species is Unthreatened
Trends	Trend Quality	Poor	Short-term Trend is less than -10% (in decline) with two or more values selected
Trends	Trend Quality	Unknown	Short-term Trend is Unknown

Summary of Information Availability

Almost all information is needed, including confirmation of presence.

Summary of Information Needs

Surveys of Waterton lake to detect the species and monitoring to explore trend.

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 - 8.1 - Invasive Non-Native/Alien Species/Diseases	2024-02-16	Niall Clancy	Carney et al. 2009	Pervasive	Slight	High	9/10 fishes sampled had the parasite (a tapeworm; Carney et al. 2009), but mortality associated with the parasite (if any) is unknown.