Fathead Minnow (*Pimephales promelas*)
Conservation Status Rank Summary

March 5, 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	2024-01-10	Y: 239158.9 km²	4.710	MTNHP Range Maps	None
Area of Occupancy	2024-03-05	23370 | 4km² cells	5.500		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			-		Factor not used in ranking.
Rarity is calculated by averaging weighted factor scores: **((4.71 × 1) + (5.50 × 2)) / 3 = 5.24**					
Trends					
Short-term Trend	2024-02-20		0.000	Expert Opinion	FWP database; not explicitly monitored across the state; however, recent prairie fish surveys have contained numerous fathead minnows. Dominant species in many pond surveys.
Long-term Trend	2024-02-20		0.000	Expert Opinion	Likely well-maintained populations given they are a generalist minnow species and can survive in extreme conditions.
Trends score is calculated by summing weighted short and long-term trend scores: **((0.00 × 2) + (0.00 × 1)) = 0.00**					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		Low/No Threats	5.500		None
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
Biological Resource Use	2024-02-20	Low	Restricted	Moderate	High	This is not yet quantified, but Region 5 processes numerous commercial bait seining permits a year. Thus, we speculate there is considerable population-level impacts to certain streams associated with commercial bait seining use.
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: (5.24 × 70%) + Threats: (5.50 × 30%) + Trends: (0.00) = 5.32

Calculated Rank: S5

Accepted Rank	S5
Date Approved	2025-02-03
Approval Authority	Montana Natural Heritage Program Staff
Rank Justification	Species is common, widely distributed, and stable.

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=AFCJB32020

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=AFCJB32020

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

None

Summary of Information Needs

None

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
Biological Resource Use - 5.4 - Fishing & Harvesting Aquatic Resources	2024-02-20	Demi Blythe	Expert Opinion	Restricted	Moderate	High	This is not yet quantified, but Region 5 processes numerous commercial bait seining permits a year. Thus, we speculate there is considerable population-level impacts to certain streams associated with commercial bait seining use.
Pollution - 9	2024-02-20	Demi Blythe	Gasque-Belz et al. 2023; Puglis et al. 2022	Unknown	Unknown	High	More recent studies have assessed legacy-contaminated groundwater effects on Fathead Minnows (Gasque-Belz et al. 2023). Increased fire frequency and intensity may lead to toxicity of streams due to fire retardant. Recent study evaluated toxicity of fire retardant on Rainbow Trout and Fathead Minnow, explicitly (Puglis et al. 2022)