Emerald Shiner (*Notropis atherinoides*)
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			-		Factor not used in ranking.
Area of Occupancy	2024-03-05	8894 | 1km² cells	4.130		From MTFWP Fish Distribution Layer
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: **((4.13 × 2)) / 2 = 4.13**					
Trends					
Short-term Trend	2024-02-20	90.0%	[-0.070, 0.000]	Duncan, M.B. 2019; FWP survey data	Duncan 2019 – emerald shiner most abundant cyprinid caught and caught at most sites sampled (Fyke net) FWP survey data: trend sites on Yellowstone River show some increases and decreases, Missouri River declining except one site upstream of Peck using trawl, Fort Peck population mostly increasing (2013-2022)
Long-term Trend	2024-02-20		-		Factor not used in ranking.
Trends score is calculated by summing weighted short and long-term trend scores: **(([-0.07, 0.00] × 2)) = [-0.14, 0.00]**					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		Unknown	-		Factor not used in ranking.
Intrinsic Vulnerability	2024-03-05	Not intrinsically vulnerable	5.500		None
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: (4.13 × 70%) + Threats: (5.50 × 30%) + Trends: ([-0.14, 0.00]) = [4.40, 4.54]

Calculated Rank: S4S5

Accepted Rank	S5
Date Approved	2025-02-03
Approval Authority	Montana Natural Heritage Program Staff
Rank Justification	Species is common and secure

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=AFCJB28120

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=AFCJB28120

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
Human Intrusions & Disturbance - 6.1 - Recreational Activities	2024-02-20	Christina Stewart	Nieman and Gray 2020; Waters 1995	Small	Unknown	High	Sedimentation has been shown to decrease feeding which in turn could decrease growth rates. If populations are exposed to excess sediment over long periods of time there could be significant impacts to that population (Nieman and Gray 2020). Along much of their preferred habitat (Yellowstone River) sources of excess sediment can come from trails (recreational), livestock trailing along the bank, overuse of livestock grazing, agriculture (Waters 1995). With fairly unregulated flows in the Yellowstone excess deposits of sediment are flushed out regularly leaving short term impacts. In smaller tributaries with populations of EM SH the impacts could be more extreme.
Natural System Modifications - 7.2 - Dams & Water Management/Use	2024-02-20	Christina Stewart	(Catalano et al. 2007; Taylor et al. 2001; Brown 1971	Small	Unknown	High	Studies in Wisconsin and Illinois have shown dams to be barriers to EM SH, species were extirpated from upstream reaches after dam install (Catalano et al. 2007, Taylor et al. 2001). It's possible poorly selected and installed culverts and other road crossings could pose as a barrier to upstream movement into tributaries of the Yellowstone and Missouri, although this species prefers larger streams (Brown 1971) some smaller tributary may not be favorable habitat regardless of barriers.
Invasive & Other Problematic Species, Genes & Diseases - 8.1 - Invasive Non-Native/Alien Species/Diseases	2024-02-20	Christian Stewart	Expert Opinion	Pervasive	Unknown	High	Possibly prey for Walleye, Pike, Bass. May not be impacting population to the point of population loss.
Climate Change & Severe Weather - 11.1 - Habitat Shifting & Alteration	2024-02-20	Christina Stewart	Expert Opinion	Pervasive	Unknown	High	Water temperature influences life history characteristics (e.g. growth), maximum age decreased with warmer water temperature (Braaten and Guy 2011)
No threats data available for this species							