Longnose Dace (*Rhinichthys cataractae*)
Conservation Status Rank Summary

March 6, 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	2024-02-16	Y: 380529.0 km²	4.710	MTNHP Range Maps	None
Area of Occupancy	2024-03-06	31310 | 1km² cells	4.810	MTFWP Fish Distribution Layer	km from mt 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: **((4.71 × 1) + (4.81 × 2)) / 3 = 4.78**					
Trends					
Short-term Trend	2024-02-16	[-6.0, 8.0%]	0.000	LeMoine et al. 2020	LeMoine et al. 2020 (95% confidence interval of occupancy change in Bitterroot drainage)
Long-term Trend	2024-02-16	0.0%	0.000	Duncan et al. 2017; Trenka 2000	Estimate based on Patton et al. 1998 study from Wyoming that found LNDC to be stable to increasing (depending on analyzed scale) from 1960-1990. Was the most common native species in the Black Hills, SD with no strong association with any habitat factor (Schultz et al. 2012 Prairie Naturalist). Very common across Montana (Duncan et al. 2017; Trenka 2000). I found no studies indicating substantial declines or increases.
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		High - low	[1.830, 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: **([1.83, 5.50]) = [1.83, 5.50]**					

Individual Threats Data

Threat Category	Date Assessed	Impact Score	Scope	Severity	Immediacy	Comments
Energy Production & Mining	2024-02-16	Low	Small	Serious	High	Only species negatively impacted by CBM development in eastern MT (42% difference in occurrence between Coal Bed Methane and control-Davis et al. 2010)
Transportation & Service Corridors	2024-02-16	Low	Pervasive	Slight	High	Only species negatively impacted by culverts in eastern MT though abundances weren't always affected. -(Passage = 0.08-0.98 95% CI; Rosenthal 2007). This is a rough estimate based on the maximum passage rate and size of proportion of Montana not in a wilderness.
Climate Change & Severe Weather	2024-02-16	High - Low	Pervasive	Serious-Slight	High	Stream warming will possibly cause declines up to 40% in MT (Clancy et al. In review)…primarily in eastern MT. A study in Wisconsin predicts much higher loss (Lyons et al. 2010). Colonization of new habitats is likely to offset some of these losses, possibly most (LeMoine et al. 2020; Elliot et al. 2022). Stream drying is likely to cause substantial additional loss (Roulson et al. 2023). I estimate actual losses will therefore be between 10 40%.
Threat Tally: 0 - Very High, [0,1] - High, 0 - Medium, [2,3] - Low Overall Threat Impact* = High - low						

*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: (4.78 × 70%) + Threats: ([1.83, 5.50] × 30%) + Trends: (0.00) = [3.89, 4.99]

Calculated Rank: S4S5

Accepted Rank	S4S5
Date Approved	2025-02-03
Approval Authority	Montana Natural Heritage Program Staff
Rank Justification	Species is widespread and stable but may decline with warming water temperatures and drought

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=AFCJB37020

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=AFCJB37020

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
Energy Production & Mining - 3.1 - Oil & Gas Drilling	2024-02-16	Niall Clancy	Davis et al. 2010	Small	Serious	High	Only species negatively impacted by CBM development in eastern MT (42% difference in occurrence between Coal Bed Methane and control-Davis et al. 2010)
Transportation & Service Corridors - 4	2024-02-16	Niall Clancy	Rosenthal 2007	Pervasive	Slight	High	Only species negatively impacted by culverts in eastern MT though abundances weren't always affected. - (Passage = 0.08-0.98 95% CI; Rosenthal 2007). This is a rough estimate based on the maximum passage rate and size of proportion of Montana not in a wilderness.
Climate Change & Severe Weather - 11.1 - Habitat Shifting & Alteration	2024-02-16	Niall Clancy	Clancy et al. In review; Roulson et al. 2023	Pervasive	Serious-Slight	High	Stream warming will possibly cause declines up to 40% in MT (Clancy et al. In review)…primarily in eastern MT. A study in Wisconsin predicts much higher loss (Lyons et al. 2010). Colonization of new habitats is likely to offset some of these losses, possibly most (LeMoine et al. 2020; Elliot et al. 2022). Stream drying is likely to cause substantial additional loss (Roulson et al. 2023). I estimate actual losses will therefore be between 10 & 40%.