Pallid Sturgeon (*Scaphirhynchus albus*)
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	2024-02-20	Y: 28501.9 km²	3.930	MTNHP Range Maps	None
Area of Occupancy			-		**Factor not used in ranking.**
Number of Occurrences	2024-02-20	12	1.380	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	2025-01-31	Narrow	-		**Factor not used in ranking.**
Rarity is calculated by averaging weighted factor scores: **((3.93 × 1) + (1.38 × 1)) / 2 = 2.66**					
Trends					
Short-term Trend	2024-02-20		-0.500	Expert Opinion	The population of 100 wild origin pallid sturgeon continues to decline as we lose individuals every year. Hatchery origin fish stocked since 1998 have ensured the genetic representation found in the wild population has been captured in this next generation of hatchery origin fish. Rotella survival estimates would suggest a decline in population when looking at the last 10 years because this window of time includes a transition in the recovery program from large stocking classes of fish to genetic maintenance/representation stockings at stocking rates for family lots just large enough to ensure persistence into the future.
Long-term Trend	2024-02-20		-	Expert opinion	**Factor not used in ranking.** Unfortunately we do not know how our present population of pallid sturgeon (i.e., Wild Origin Pallid Sturgeon + Hatchery Origin Pallid Sturgeon) compares to the historical population pre-European settlement.

Trends score is calculated by summing weighted short and long-term trend scores:
((-0.50 × 2)) = -1.00

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		Very high	0.000		None
Intrinsic Vulnerability	2025-01-31	Moderately vulnerable	-		**Factor not used in ranking.**
Threat score is calculated from Overall Threat Impact when available or Intrinsic Vulnerability if not: **(0.00) = 0.00**					

Individual Threats Data

Threat Category	Date Assessed	Impact Score	Scope	Severity	Immediacy	Comments
Natural System Modifications	2024-02-20	Very high	Pervasive	Extreme	High	Recruitment Failure, Habitat Alteration and fragmentation; Braaten et al 2014, Guy et al 2015, Braaten et al 2022, Lack of adequate drift distance below current spawning areas due to habitat fragmentation caused by flood control dams has led to a failure to recruit wild spawned Pallid Sturgeon beyond the young of year life stage. Braaten et al 2014, Guy et al 2015, Braaten et al 2022, Lack of adequate drift distance below current spawning areas due to habitat fragmentation caused by flood control dams has led to a failure to recruit wild spawned Pallid Sturgeon beyond the young of year life stage. Mayden and Kuhajda 1997, Dryer and Sandvol 1993, USFWS 2000, 2003, MT AFS SOC profiles, Mainstem Missouri flood control dams and smaller irrigation diversion dams on mainstem and tributaries have reduced the necessary runway for the larval drift stage of Pallid Sturgeon life history.
Invasive & Other Problematic Species, Genes & Diseases	2024-02-20	Low	Pervasive	Slight	High	Holley et al 2022, Study demonstrates diet overlap between endangered pallid sturgeon and the more abundant shovelnose sturgeon at the larval stage.
Threat Tally: 1 - Very High, 0 - High, 0 - Medium, 1 - Low Overall Threat Impact* = Very high						

*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: (2.66 × 70%) + Threats: (0.00 × 30%) + Trends: (-1.00) = 0.86

Calculated Rank: S1

Accepted Rank	S1
Date Approved	Date Unknown
Approval Authority	Legacy Assessment: MTNHP Staff
Rank Justification	Wild origin fish continue to decline and species faces significant threats

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=AFCAA02010

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=AFCAA02010

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

Information to assess status is available

Summary of Information Needs

No further information is needed

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
Natural System Modifications - 7.2 - Dams & Water Management/Use	2024-02-20	Caleb Bollman	Braaten et al 2014, Guy et al 2015, Braaten et al 2022; Mayden and Kuhajda 1997;	Pervasive	Extreme	High	Recruitment Failure, Habitat Alteration and fragmentation; Braaten et al 2014, Guy et al 2015, Braaten et al 2022, Lack of adequate drift distance below current spawning areas due to habitat fragmentation caused by flood control dams has led to a failure to recruit wild spawned Pallid Sturgeon beyond the young of year life stage. Braaten et al 2014, Guy et al 2015, Braaten et al 2022, Lack of adequate drift distance below current spawning areas due to habitat fragmentation caused by flood control dams has led to a failure to recruit wild spawned Pallid Sturgeon beyond the young of year life stage. Mayden and Kuhajda 1997, Dryer and Sandvol 1993, USFWS 2000, 2003, MT AFS SOC profiles, Mainstem Missouri flood control dams and smaller irrigation diversion dams on mainstem and tributaries have reduced the necessary runway for the larval drift stage of Pallid Sturgeon life history.
Invasive & Other Problematic Species, Genes & Diseases - 8.2 - Problematic Native Species/Diseases	2024-02-20	Caleb Bollman	Holley et al 2022	Pervasive	Slight	High	Holley et al 2022, Study demonstrates diet overlap between endangered pallid sturgeon and the more abundant shovelnose sturgeon at the larval stage.