Plains Hog-nosed Snake (*Heterodon nasicus*)
Conservation Status Rank Summary

January 8, 2025

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	2024-10-23	Y: 233447.6 km²	4.710	MTNHP Range Maps	None
Area of Occupancy	2024-10-23	14188 | 4km² cells	5.500	MTNHP Modeling	None
Number of Occurrences	2024-10-23	186	4.130	MTNHP Databases	None
Population Size			-		Factor not used in ranking.
# of Occurrences in Good Condition	2024-10-23		[2.200, 3.300]	NHP data	Many areas where the species occurs are threatened with argicultural conversion or are otherwise degraded
% of Area Occupied in Good Condition			-		Factor not used in ranking.
Environmental Specificity	2018-05-03	Narrow	-	MTNHP Species Rank Data Table	Factor not used in ranking. Arid areas with friable soil | Methodology: NS (2003) | Original Score: B
Rarity is calculated by averaging weighted factor scores: **((4.71 × 1) + (5.50 × 2) + (4.13 × 1) + ([2.20, 3.30] × 2)) / 6 = [4.04, 4.41]**					
Trends					
Short-term Trend	2024-10-23		-	MTNHP Data	Factor not used in ranking. No data on trends available
Long-term Trend	2018-05-03		[-0.400, -0.310]	MTNHP Species Rank Data Table	Based on anecdotal reports this species is much less common than it previously was. The exact extent of these declines is unknown but if the reports are correct, the decline is substantial | Methodology: NS (2003) | Original Score: B
Trends score is calculated by summing weighted short and long-term trend scores: **(([-0.40, -0.31] × 1)) = [-0.40, -0.31]**					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		Very high - high	[0.000, 1.830]		Alteration of floodplain dynamics and changes in the abundance and distribution of amphibian prey. Mortality due to basking on roads both directly from vehicle collisions and persecution due to increased visibility may contribute to higher mortality of so
Intrinsic Vulnerability	*2018-05-03*	*Moderately vulnerable*	*-*	*MTNHP Species Rank Data Table*	*Factor not used in ranking.* Moderately Vulnerable. Species exhibits moderate age of maturity, frequency of reproduction, and/or fecundity such that populations generally tend to recover from decreases in abundance within 5-20 years or 2-5 generations. Species has good dispersal ca	Methodology: NS (2003)	Original Score: B
Threat score is calculated from Overall Threat Impact when available or Intrinsic Vulnerability if not: **([0.00, 1.83]) = [0.00, 1.83]**					

Individual Threats Data

Threat Category	Date Assessed	Impact Score	Scope	Severity	Immediacy	Comments
Agriculture & Aquaculture	2024-10-23	High	Pervasive	Serious	High	Conversion of native steppe to row crops. 1% of suitable habitat is on private lands (MTNHP) and largly falls within at risk areas for conversion
Transportation & Service Corridors	2024-10-23	High - Medium	Large	Serious-Moderate	High	Snakes suffer high rates of mortality when basking on roads
Biological Resource Use	2024-10-23	Medium - Low	Restricted	Serious-Moderate	High	Persecution due to people's fear of snakes or being mistaken for rattlesnakes, collection for the pet trade.
Threat Tally: 0 - Very High, [1,2] - High, 1 - Medium, [0,1] - Low Overall Threat Impact* = Very high - 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: ([4.04, 4.41] × 70%) + Threats: ([0.00, 1.83] × 30%) + Trends: ([-0.40, -0.31]) = [2.43, 3.32]

Calculated Rank: S3?

Accepted Rank	S2
Date Approved	Date Unknown
Approval Authority	Legacy Assessment: MTNHP Staff
Rank Justification	Species is found across eastern Montana in suitable habitat but is rarely observed within its range. Trend is not well studied, and threats are poorly characterized. They likely include habitat loss due to agricultural conversion, mortality from vehicles when basking on roads and persecution by people mistaking them for rattlesnakes. Collection for the pet trade may occur as well.

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=ARADB17013

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=ARADB17013

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
Rarity is well documented although given the cryptic nature of the species it may be more common than it appears. Trend is unknown and threats are poorly characterized.

Summary of Information Needs
Repeated surveys of historic populations will help determine trend. Exploration of mortality will help determine threats and threat impacts.

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
Agriculture & Aquaculture - 2.1 - Annual & Perennial Non-Timber Crops	2024-10-23	Dan Bachen	MTNHP data and WWF Plowprint tool	Pervasive	Serious	High	Conversion of native steppe to row crops. 1% of suitable habitat is on private lands (MTNHP) and largly falls within at risk areas for conversion
Transportation & Service Corridors - 4.1 - Roads & Railroads	2024-10-23	Dan Bachen	Expert Opinion	Large	Serious-Moderate	High	Snakes suffer high rates of mortality when basking on roads
Biological Resource Use - 5.1 - Hunting & Collecting Terrestrial Animals	2024-10-23	Dan Bachen	Expert Opinion	Restricted	Serious-Moderate	High	Persecution due to people's fear of snakes or being mistaken for rattlesnakes, collection for the pet trade.