

Northern Leopard Frog (*Lithobates pipiens*) Conservation Status Rank Summary

September 30, 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	2024-10-10	Y: 282028.7 km ²	4.710	MTNHP Range Maps	None
Area of Occupancy	2024-10-10	9641 4km ² cells	4.810	MTNHP Modeling	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	2018-05-01	Narrow	-	MTNHP Species Rank Data Table	Factor not used in ranking. Species relies on riparian areas and lentic or lotic (low flow) waterbodies. Methodology: NS (2003) Original Score: B
Rarity is calculated by averaging weighted factor scores: $((4.71 \times 1) + (4.81 \times 2)) / 3 = 4.78$					
Trends					
Short-term Trend	2018-05-01		0.000	MTNHP Species Rank Data Table	Consistent detections in eastern and central Montana appear to indicate a stable population within the last 10 years. Some re-introduced populations in western Montana are persisting, however these do not account for more than 10% of historic range. Methodology: NS (2003) Original Score: E
Long-term Trend	2018-05-01		-0.220	MTNHP Species Rank Data Table	Populations west of the continental divide were almost entirely extirpated in the 1970s or 1980s. Declines of 80% were also noted in the central region of the state. Wetlands have declined across the state as well. Methodology: NS (2003) Original Score: C
Trends score is calculated by summing weighted short and long-term trend scores: $((0.00 \times 2) + (-0.22 \times 1)) = -0.22$					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		Medium	3.670		Application of herbicides and pesticides to agricultural lands , general loss of wetlands, ongoing effects of pathogens
Intrinsic Vulnerability	2018-05-01	Not intrinsically vulnerable	-	MTNHP Species Rank Data Table	Factor not used in ranking. Not intrinsically vulnerable due to high fecundity and relatively low age of maturity. Methodology: NS (2003) Original Score: C
Threat score is calculated from Overall Threat Impact when available or Intrinsic Vulnerability if not: (3.67) = 3.67					

Individual Threats Data

Threat Category	Date Assessed	Impact Score	Scope	Severity	Immediacy	Comments
Agriculture & Aquaculture	2024-10-10	Low	Restricted	Slight	High	Loss and fragmentation of habitat due to conversion to row crops.
Pollution	2024-10-10	Low	Large	Slight	High	Degradation of riparian habitat from agricultural runoff.
Climate Change & Severe Weather	2024-10-10	Medium	Pervasive	Moderate	High	Drought impacts on permanent wetlands may lead to loss of breeding habitat
Threat Tally: 0 - Very High, 0 - High, 1 - Medium, 2 - Low Overall Threat Impact* = Medium						

*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: $(4.78 \times 70\%)$ + Threats: $(3.67 \times 30\%)$ + Trends: (-0.22) = 4.23

Calculated Rank: S4

Accepted Rank	S3S4
Date Approved	2024-09-30
Approval Authority	Montana Species of Concern Committee
Rank Justification	Species has suffered declines west of the continental divide possibly due to the introduction of Chytrid Fungus. Impacts to the species in eastern and central Montana were negligible where the species remains common. Reintroduction efforts in the Flathead Valley have successfully established a viable population and recovery in this area appears possible. Threats to the species include habitat loss and degradation due to drought and pollution from agricultural runoff. It is unknown if future climate changes will exacerbate impacts of Chytrid. As eastern populations are doing well, the calculated status rank does not account for the near extirpation of western populations. As such, the Montana Species of Concern Committee voted to lower the rank to S3S4 to highlight the near loss of this population and potential for reintroduction of the species. The species should be considered a Species of Concern west of the Continental Divide, but common to the east.

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=AAABH01170>

Predicted Suitable Habitat Model:

<https://mtnhp.mt.gov/resources/models/?elcode=AAABH01170>

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

Data for status assessment are generally good. Trend surveys for the eastern region of the state are out-of-date, but the species still appears common.

Summary of Information Needs

Monitoring of populations in current and future reintroduction areas to establish trend for this region is necessary to inform trend. Occasional monitoring of populations east of the continental divide should be done periodically to help inform trend and assess 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	Immediacy	Comments
Agriculture & Aquaculture - 2.1 - Annual & Perennial Non-Timber Crops	2024-10-10	Dan Bachen	Expert Opinion	Restricted	Slight	High	Loss and fragmentation of habitat due to conversion to row crops.
Invasive & Other Problematic Species, Genes & Diseases - 8.1 - Invasive Non-Native/Alien Species/Diseases	2024-10-10	Dan Bachen	Maxell et al. 2009	Pervasive	Moderate	Insignificant	Chytrid fungus introduction caused the extirpation of the species west of the Continental Divide. It may have had minor impacts on eastern populations as well. Current reintroduction efforts have established self-sustaining populations, so ongoing impacts are unlikely.
Pollution - 9.3 - Agricultural & Forestry Effluents	2024-10-10	Dan Bachen	Maxell et al. 2009	Large	Slight	High	Degradation of riparian habitat from agricultural runoff.
Climate Change & Severe Weather - 11.1 - Habitat Shifting & Alteration	2024-10-10	Dan Bachen	Expert Opinion	Pervasive	Unknown	High	Chytrid fungus has had past impacts to the species. It is unknown if future warming will cause future impacts, or how severe these impacts will be.
Climate Change & Severe Weather - 11.2 - Droughts	2024-10-10	Dan Bachen	Expert Opinion	Pervasive	Moderate	High	Drought impacts on permanent wetlands may lead to loss of breeding habitat