

# *Danaus plexippus* (Monarch)

## Conservation Status Rank Summary

October 9, 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
<b>Rarity</b>					
Range Extent	2024-09-12	S: 380530.8 km <sup>2</sup>	4.710	MTNHP Range Maps	None
Area of Occupancy			-		Factor not used in ranking.
Number of Occurrences	2024-10-09	84	4.130	MTNHP Databases	None
Population Size			-		Factor not used in ranking.
# of Occurrences in Good Condition	2024-10-09		2.200	MTNHP data	Many of the occurrences for this species are adjacent to agricultural lands or urban areas. Pesticide use probably degrades many EOs
% of Area Occupied in Good Condition			-		Factor not used in ranking.
Environmental Specificity	2022-12-01	Narrow	-	Expert Opinion	Factor not used in ranking. Specialist but key requirements common. Although the species is found across a diversity of habitats, caterpillars are milkweed specialists. Milkweed species are found across the state but distribution can be patchy and these species can be quite rare in some ecosystems.
Rarity is calculated by averaging weighted factor scores: $((4.71 \times 1) + (4.13 \times 1) + (2.20 \times 2)) / 4 = 3.31$					
<b>Trends</b>					
Short-term Trend	2022-12-01		[-0.400, -0.220]	USFWS 2020	Population trend in Montana is not well studied. Eastern populations have declined ~ 50% since 2010 and the western population has declined >90%. As Montana has individuals from both populations the short-term decline likely exceeds 50% although the exact numbers are unknown. This component was assessed in 2020
Long-term Trend			-		Factor not used in ranking.
Trends score is calculated by summing weighted short and long-term trend scores: $((-0.40, -0.22) \times 2) = [-0.80, -0.44]$					

## Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
<b>Threats</b>					
<b>Overall Threat Impact</b>		High - medium	[1.830, 3.670]		None
<b>Intrinsic Vulnerability</b>			-		Factor not used in ranking.
Threat score is calculated from Overall Threat Impact when available or Intrinsic Vulnerability if not: ( [1.83, 3.67] ) = [1.83, 3.67]					

### Individual Threats Data

Threat Category	Date Assessed	Impact Score	Scope	Severity	Immediacy	Comments
<b>Pollution</b>	2024-09-12	High - Medium	Large	Serious-Moderate	High	None
<b>Climate Change &amp; Severe Weather</b>	2024-09-12	Low	Restricted	Moderate	High	None
Threat Tally: 0 - Very High, [0,1] - High, [0,1] - Medium, 1 - Low Overall Threat Impact* = High - 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:  $(3.31 \times 70\%)$  + Threats:  $([1.83, 3.67] \times 30\%)$  + Trends:  $([-0.80, -0.44]) = [2.07, 2.98]$

Calculated Rank: S2S3

Accepted Rank	S2S3
Date Approved	2021-02-19
Approval Authority	Montana Species of Concern Committee
Rank Justification	Species is rare across most of Montana and has undergone severe declines in the past decades. It faces threats from pesticide use and habitat alteration and the potential decoupling of migration cues from host plant flowering due to climate change

## 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](https://mtnhp.mt.gov/docs/Montana_State_Rank_Criteria_20211201.pdf)

Montana Field Guide Species Account:

<https://fieldguide.mt.gov/speciesDetail.aspx?elcode=IILEPP2010>

Predicted Suitable Habitat Model:

<https://mtnhp.mt.gov/resources/models/?elcode=IILEPP2010>

## 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

Species distribution and habitat associations are known, but trend and impacts of threats are poorly understood.

### Summary of Information Needs

Monitoring of known populations to examine trends and better assessment of threats and threat impacts within the state are necessary to establish a more rigorous rank.