Cardamine rupicola (Cliff Toothwort)
Conservation Status Rank Summary

Date Published: August 28, 2026

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 Factor Rating	Score	Data Source	Comments
Rarity					
Range Extent	2026-02-17		3.140	GIS Analysis	Based on the known occurrences, the 2026 MTNHP range is approximately 5,400 sq km.
Area of Occupancy	2026-02-17	24 | 4km² cells D = 6-25 4-km² grid cells	2.060	MTNHP Databases	Of the approximate 96,004 2km x 2km grid cells that cover Montana, known occurrences of the species occupy 24 grid cells.
Number of Occurrences	2026-02-17	28 C = 21 - 80	2.750	MTNHP Databases	Observations group into approximately 28 occurrences.
Population Size	2026-02-17	* F = 10,000 - 100,000 individuals	3.930	MTNHP Databases	Many observations lack population estimates. However, the available data supports an estimate of at least 10,000 plants as 2 occurrences have estimates of thousands of plants and many others describe the plant as "common"
# of Occurrences in Good Condition	2026-02-17	* C = Few (4-12) occurrences with excellent or good viability or ecological integrity	2.200	MTNHP Databases, Expert Opinion	Estimated. At least a few occurrences would appear to be in good condition and have good viability.
% of Area Occupied in Good Condition			-		**Factor not used in ranking.**
Environmental Specificity	2025-03-01	Very narrow to narrow AB = Very narrow to narrow	-	Expert Opinion	**Factor not used in ranking.** Assessed by Scott Mincemoyer
Rarity is calculated by averaging weighted factor scores: **((3.14 × 1) + (2.06 × 2) + (2.75 × 1) + (3.93 × 2) + (2.20 × 2)) / 8 = 2.78**					
Trends					
Short-term Trend	2026-02-17	* FG = Decline of 30% to relatively stable	[-0.070, 0.000]	Expert Opinion	Data to determine short-term trends are lacking, though the species' habitat is intact and remote, so populations have likely been relatively stable or experienced only minor declines in the recent past.
Long-term Trend	2026-02-17	* U = Unknown	-	xpert Opinion	**Factor not used in ranking.** Long-term trends are unknown, though habitat is intact and remote so populations may have been stable over the long-term.

Trends score is calculated by summing weighted short and long-term trend scores:
(([-0.07, 0.00] × 2)) = [-0.14, 0.00]

*Values may be absent if not precisely estimated; factors may still be assessed for rank if a Factor Rating can be assigned.

Threats

Rank Factor	Date Assessed	Value / Factor Rating	Score	Data Source	Comments
Threats					
Overall Threat Impact		Medium - Low / CD = Medium - Low	[3.670, 5.500]		Significant threats appear to be negligible or limited in scope and/or severity as the species largely occurs in remote areas, of which many are designated as wilderness. Climate change including increased ambient temperatures, decreased snowpacks, and increased frequencies and severities of drought could have negative impacts on this species; however, field-based data on the timing and magnitude from climate change is not available. Therefore, the potential threat from climate change is not used in the calculation of the overall threat rank, score, or final subnational rank.
Intrinsic Vulnerability	2025-03-01	Moderately vulnerable / B = Moderately vulnerable	-	Expert Opinion	**Factor not used in ranking.** Assessed by Scott Mincemoyer
Threat score is calculated from Overall Threat Impact when available or Intrinsic Vulnerability if not: **([3.67, 5.50]) = [3.67, 5.50]**					

Individual Threats Data

Threat Category	Date Assessed	Impact Score	Scope	Severity	Immediacy	Comments
Climate Change & Severe Weather	2026-02-17	High - Low	Pervasive	Serious-Slight	High-Low	Potential impacts related to climate change, including from increased temperatures, changes in precipitation patterns and decreases in snowpack may negatively impact the species. Species is rated as Highly Vulnerable to climate change by the CCVI.
Threat Tally: 0 - Very High, [0,1] - High, 0 - Medium, [0,1] - Low Overall Threat Impact* = Medium - 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: (2.78 × 70%) + Threats: ([3.67, 5.50] × 30%) + Trends: ([-0.14, 0.00]) = [2.91, 3.60]

Calculated Rank: S3?

Accepted Rank	S3
Author(s)	Scott Mincemoyer
Rank Approved By	Andrea Pipp
State Rank Reason	*Cardamine rupicola* is endemic to Montana. Worldwide, this species is only found in the Mission Mountains, Swan Range, and mountains in the Bob Marshall Wilderness Complex. Its rarity increases the risk of and making it vulnerable to extinction. Low threats related to recreational activities have been reported, though the nature of its remote, alpine habitat presumes that populations are mostly stable. Climate change poses a potential risk to the state's population under the conditions of increased temperatures and decreased snowpack levels. Monitoring at a subset of occurrences is necessary to determine populations trends. Continued revisit surveys to known occurrences, at specified intervals, that collect population, habitat, and potential threat information is needed to refine and maintain accurate and timely state conservation status ranks.

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=PDBRA0K130

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=PDBRA0K130

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

Summary of Information Needs

Monitoring at a subset of occurrences is necessary to determine populations trends. Continued revisit surveys to known occurrences, at specified intervals, that collect population, habitat, and potential threat information is needed to refine and maintain accurate and timely state conservation status ranks.

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
Climate Change & Severe Weather - 11	2026-02-17	S. Mincemoyer	CCVI, Expert Opinion	Pervasive	Serious-Slight	High-Low	Potential impacts related to climate change, including from increased temperatures, changes in precipitation patterns and decreases in snowpack may negatively impact the species. Species is rated as Highly Vulnerable to climate change by the CCVI.