

Great Gray Owl (*Strix nebulosa*)

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	2024-04-19	Y: 151561.0 km ²	3.930	MTNHP Range Maps	None
Area of Occupancy	2024-04-19		4.130	MTNHP Modeling	None
Number of Occurrences	2024-04-19	123	4.130	MTNHP Databases	None
Population Size	2024-04-19	[1386, 2348]	2.360	Spacht et al. 2024	1,386-2,348 occupied territories from Spacht 2024
# of Occurrences in Good Condition	2024-04-19		4.400	Expert Opinion	The species is predominately found on National forest lands with varying degrees of protection and condition. Species presence is considered in project planning and the majority of occurrences are likely in good condition.
% of Area Occupied in Good Condition			-		Factor not used in ranking.
Environmental Specificity	2009-01-27	Narrow	-	MTNHP Species Rank Data Table	Factor not used in ranking. Need large diameter trees which are widespread, but rare. Methodology: NS (2003) Original Score: B
Rarity is calculated by averaging weighted factor scores: $((3.93 \times 1) + (4.13 \times 2) + (4.13 \times 1) + (2.36 \times 2) + (4.40 \times 2)) / 8 = 3.73$					
Trends					
Short-term Trend	2024-04-19		-	Spacht 2024	Factor not used in ranking. No Breeding Bird Survey (BBS) data for Montana. Initial inventory was conducted between 2019 and 2022. Repeat surveys will help understand trend
Long-term Trend	2009-01-27		-0.140	MTNHP Species Rank Data Table	Forest openings with wetlands stable, but probably relatively large decline in large diameter trees species since European arrival. Methodology: NS (2003) Original Score: D
Trends score is calculated by summing weighted short and long-term trend scores: $((-0.14 \times 1)) = -0.14$					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		Medium	3.670		None
Intrinsic Vulnerability	2009-01-27	Moderately vulnerable	-	MTNHP Species Rank Data Table	Factor not used in ranking. Methodology: NS (2003) Original Score: B
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
Biological Resource Use	2024-04-19	Low	Small	Serious	High	From Spacht 2024: An increase in recently harvested area from 0% to 20% is modeled to result in a change in occupancy from 0.21 to 0.06. The projected area of harvest within high suitability habitat over the next decade is unknown and effort by the USFS are made to buffer known nests, but timber harvest may result in serious declines over a small portion of this species range.
Natural System Modifications	2024-04-19	Medium	Restricted	Serious	High	From Spacht 2024: Increasing burned area in a home range area (~50 sq km) from 0% to 20% of the area results in a change in predicted probability of occupancy from 0.19 to 0.08.
Threat Tally: 0 - Very High, 0 - High, 1 - Medium, 1 - 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: $(3.73 \times 70\%)$ + Threats: $(3.67 \times 30\%)$ + Trends: (-0.14) = 3.57

Calculated Rank: S4

Accepted Rank	S3S4
Date Approved	2024-09-30
Approval Authority	Montana Species of Concern Committee
Rank Justification	Species is uncommon across much of western Montana. It faces moderate threats from timber harvest and fire. Initial surveys have established baseline occupancy estimates, but trend is still poorly characterized.

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=ABNSB12040>

Predicted Suitable Habitat Model:

<https://mtnhp.mt.gov/resources/models/?elcode=ABNSB12040>

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 has robust data on rarity, and threats. Short-term Trend is not established.

Summary of Information Needs

Baseline surveys were established in the early 2020s. These surveys should be repeated at a meaningful interval to establish trend for the species.