Burrowing Owl (*Athene cunicularia*)
Conservation Status Rank Summary

December 4, 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	2024-12-04	S: 310344.8 km²	4.710	MTNHP Range Maps	None
Area of Occupancy	2024-10-07	9030 | 4km² cells	4.810	MTNHP Modeling	None
Number of Occurrences	2024-10-07	1290	5.500	MTNHP Databases	None
Population Size			-		**Factor not used in ranking.**
# of Occurrences in Good Condition	2024-10-07		0.000	MTNHP Data	All occurrences are impacted by Plague and other threats
% of Area Occupied in Good Condition			-		**Factor not used in ranking.**
Environmental Specificity	2011-12-20	Narrow	-	MTNHP Species Rank Data Table	**Factor not used in ranking.** Narrow Specialist. Dependent on burrow habitats which are still widespread because prairie dogs are fairly widespread. | Methodology: NS (2003) | Original Score: B
Rarity is calculated by averaging weighted factor scores: **((4.71 × 1) + (4.81 × 2) + (5.50 × 1) + (0.00 × 2)) / 6 = 3.31**					
Trends					
Short-term Trend	2024-10-07		-	Expert Opinion	**Factor not used in ranking.** Data of sufficient quality to track short-term trend are not available from BBS or IMBCR
Long-term Trend	2011-12-20		-0.140	MTNHP Species Rank Data Table	Probably have lost >25% of prairie dog habitat in Montana since European arrival. Extirpated from B.C. where reintroduction efforts have reestablished small numbers. Also, range has contracted in Minnesota and other portions of Canada. Evidence suggests populations have declined due to habitat loss, pesticides, predators, and vehicle collisions. Human shooting and nest burrow disturbance have been a significant problem in some areas. | Methodology: NS (2003) | Original Score: D
Trends score is calculated by summing weighted short and long-term trend scores: **((-0.14 × 1)) = -0.14**					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		High	1.830		None
Intrinsic Vulnerability	2011-12-20	Not intrinsically vulnerable	-	MTNHP Species Rank Data Table	**Factor not used in ranking.** Not Intrinsically Vulnerable. Species matures quickly, reproduces frequently, and/or has a high fecundity such that populations recover quickly (5 years or 2 generations) from decreases in abundance. Species has good dispersal capabilities such that extirpated populations generally become reestablished through natural recolonization. | Methodology: NS (2003) | Original Score: C
Threat score is calculated from Overall Threat Impact when available or Intrinsic Vulnerability if not: **(1.83) = 1.83**					

Individual Threats Data

Threat Category	Date Assessed	Impact Score	Scope	Severity	Immediacy	Comments
Agriculture & Aquaculture	2024-10-07	Medium	Restricted	Serious	High	Persecution and removal of Prairie Dogs and ground squirrels may lead to loss of burrow habitat
Biological Resource Use	2024-10-07	Medium	Large	Moderate	High	Direct morality from shooting via intentional shooting or incidental shooting when mistaken for Prairie Dogs or Ground Squirrels. Consumption of lead-tainted carcasses
Invasive & Other Problematic Species, Genes & Diseases	2024-10-07	Medium	Pervasive	Moderate	High	Larger colonies of Black-tailed Prairie Dog are associated with lower owl densities and breeding success. Sylvatic Plague reduces prairie dog density and increases colony size and ongoing impacts on owls are likely
Threat Tally: 0 - Very High, 0 - High, 3 - Medium, 0 - Low Overall Threat Impact* = 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: (3.31 × 70%) + Threats: (1.83 × 30%) + Trends: (-0.14) = 2.72

Calculated Rank: S3

Accepted Rank	S3B
Date Approved	Date Unknown
Approval Authority	Legacy Assessment: MTNHP Staff
Rank Justification	Species is found across south, central, and eastern Montana and associated with prairie dog and ground squirrel colonies. Current population trend in Montana is unknown. It faces threats from loss of prairie dog colonies due to plague and agricultural practices that seek to reduce or eliminate rodent populations. Species is also vulnerable to direct mortality from recreational shooting of prairie dogs.

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=ABNSB10010

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=ABNSB10010

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 to assess species status are generally available, but short-term trend is not.

Summary of Information Needs

Species does not appear to have a current monitoring effort. Given the high level of threats and declines across the species range, implementation of monitoring across the species range in Montana will provide data necessary to assess current trend and impacts of threats.

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 - 2.3 - Livestock Farming & Ranching	2024-10-07	Dan Bachen	Expert Opinion	Restricted	Serious	High	Pesicution and removal of Prairie Dogs and ground squirrels may lead to loss of burrow habitat
Biological Resource Use - 5.1 - Hunting & Collecting Terrestrial Animals	2024-10-07	Dan Bachen	Restani et al. 2001; McTee et al. 2019	Large	Moderate	High	Direct morality from shooting via intential shooting or incidental shooting when mistaken for Prairie Dogs or Ground Squirrels. Consumtion of lead-tainted carcasses
Invasive & Other Problematic Species, Genes & Diseases - 8.1 - Invasive Non-Native/Alien Species/Diseases	2024-10-07	Dan Bachen	Hughes 1993, Desmond and Savidge 1996; Restani et al. 2001; Woodard 2002	Pervasive	Moderate	High	Larger colonies of Black-tailed Prairie Dog are associated with lower owl densities and breeding success. Sylvatic Plague reduces prairie dog density and increases colony size and ongoing impacts on owls are likley