Bombus sitkensis (Sitka Bumble Bee)
Conservation Status Rank Summary

June 19, 2025

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	2025-06-19	Y: 73483.8 km²	3.930	MTNHP Range Maps	None
Area of Occupancy	2025-06-19	1349 | 4km² cells	4.130	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	2025-06-10	Broad	-	Expert Opinion (Xerces, 2025)	Factor not used in ranking.
Rarity is calculated by averaging weighted factor scores: **((3.93 × 1) + (4.13 × 2)) / 3 = 4.06**					
Trends					
Short-term Trend	2025-06-19		-		Factor not used in ranking.
Long-term Trend			-		Factor not used in ranking.
No trend data used in this rank					

Threats

Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Threats					
Overall Threat Impact		High - medium	[1.830, 3.670]		None
Intrinsic Vulnerability	2025-06-10	Moderately vulnerable	-	Expert Opinion (Xerces, 2025)	**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
Agriculture & Aquaculture	2025-06-10	High - Low	Large	Serious-Slight	High	Unmanaged or excessive grazing negatively impacts floral and nesting resources for bumble bees, contributing to a decline in bee abundance and richness (Kimoto et al. 2012; Hatfield and LeBuhn 2007; Xie et al. 2008). Low grazing intensity can preserve flowers and support bumble bees (Scohier et al. 2013); however, in highly grazed areas, the height of floral resources decreases significantly, which can reduce bumble bee species richness and abundance (Xie et al. 2008). Livestock grazing can disturb soil and destroy or damage bumble bee colonies and potential nesting sites (Sugden 1985), posing a threat for Bombus sitkensis. Approximately 70% of Montana consists of rangelands and pasturelands, spanning both privately owned and public lands (USDA 2024).
Natural System Modifications	2025-06-10	Low	Restricted	Slight	Moderate	Fire suppression has altered forest structure and composition throughout the Rocky Mountains (Keane et al. 2002). Fires can enhance habitat heterogeneity within forest landscapes, which is known to positively influence bumble bee abundance (Galbraith et al. 2019). One of the consequences of excluding fire in forest management has been an increase in woody plant encroachment, leading to a decrease in small forest openings, which provide the availability of understory

						flowering resources (Janousek et al. 2023; Galbraith et al. 2019) for species such as Bombus sitkensis that rely on montane meadows (Williams et al. 2014).
Climate Change & Severe Weather	2025-06-10	Medium	Pervasive	Moderate	High	Bombus sitkensis often occurs in montane meadows (Williams et al. 2014), making this species vulnerable to the impacts of climate change. Climate change may adversely impact B. sitkensis through life history changes, including variable/unpredictable environmental cues; changes in the nest-site availability, changes in times of emergence; and increasing overwintering mortality (Cameron and Sadd 2020). Increasing temperatures may reduce foraging activity (Martinet et al. 2021) and may reduce floral resource availability (Ogilvie et al. 2017). Rising temperatures affect bumble bees at all life stages, with queens being especially vulnerable while overwintering underground. Increasing soil temperature may lead to earlier queen emergence when floral resources are limited (Kudo et al. 2019). Drought can further reduce continuous floral resource availability and negatively impact bumble bee colony performance (Hemberger et al. 2022).
Threat Tally: 0 - Very High, [0,1] - High, 1 - Medium, [1,2] - 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: (4.06 × 70%) + Threats: ([1.83, 3.67] × 30%) + Trends: (0.00) = [3.39, 3.95]

Calculated Rank: S4?

Accepted Rank	S4
Date Approved	2025-06-19
Approval Authority	Montana Natural Heritage Program Staff
Rank Justification	Species is relativly common in western Montana in suitable habitat. It faces threats from grazing, fire, and a warming climate. Trend is unknown.

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=IIHYM24230

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=IIHYM24230

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	2025-06-10	Xerces (Michelle Toshack)	Review of published literature	Large	Serious-Slight	High	Unmanaged or excessive grazing negatively impacts floral and nesting resources for bumble bees, contributing to a decline in bee abundance and richness (Kimoto et al. 2012; Hatfield and LeBuhn 2007; Xie et al. 2008). Low grazing intensity can preserve flowers and support bumble bees (Scohier et al. 2013); however, in highly grazed areas, the height of floral resources decreases significantly, which can reduce bumble bee species richness and abundance (Xie et al. 2008). Livestock grazing can disturb soil and destroy or damage bumble bee colonies and potential nesting sites (Sugden 1985), posing a threat for Bombus sitkensis. Approximately 70% of Montana consists of rangelands and pasturelands, spanning both privately owned and public lands (USDA 2024).
Natural System Modifications - 7.1 - Fire & Fire Suppression	2025-06-10	Xerces (Michelle Toshack)	Review of published literature	Restricted	Slight	Moderat e	Fire suppression has altered forest structure and composition throughout the Rocky Mountains (Keane et al. 2002). Fires can enhance habitat heterogeneity within forest landscapes, which is known to positively influence bumble bee abundance (Galbraith et al. 2019). One of the consequences of excluding fire in forest management has been an increase in woody plant encroachment, leading to a decrease in small forest openings, which provide the availability of understory flowering resources (Janousek et al. 2023; Galbraith et al. 2019) for species such as Bombus sitkensis that rely on montane meadows (Williams et al. 2014).
Climate Change & Severe Weather - 11.3 - Temperature Extremes	2025-06-10	Xerces (Michelle Toshack)	Review of published literature	Pervasive	Moderate	High	Bombus sitkensis often occurs in montane meadows (Williams et al. 2014), making this species vulnerable to the impacts of climate change. Climate change may adversely impact B. sitkensis through life history changes, including variable/unpredictable environmental cues; changes in the nest-site availability, changes in times of emergence; and increasing overwintering mortality (Cameron and Sadd 2020). Increasing temperatures may reduce foraging activity (Martinet et al. 2021) and may reduce floral resource availability (Ogilvie et al. 2017). Rising temperatures affect bumble

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