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NATURAL HERITAGE PROGRAM

Zoology Program Update

Dan Bachen – December 11th, 2025

Representing Montana's Animal Taxa

652 VERTEBRATES

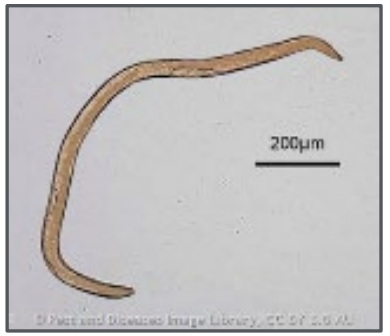
191 Molluscs

6,858 Arthropods → 12-15,000??

Pollinators!

36 Annelids

12 PLATYHELMINTHES



31 Nematodes

4 PORIFERANS

9 ROTIFERS

2 CNIDARIA

23 Tardigrades

NEMATOPHORA?
BRYOZOA?
NEMERTEA?

ENTOPROCTA?
GASTROTRICHA?

~8,000 SPECIES…A LONG WAY TO GO!

Increasing Invertebrate Information

- Partnered with invertebrate experts
  - Dave Stagliano, 500 aquatic invertebrates
  - Marian Lyman, 300 moths
  - Xerces Society, all native bumble bees
- Assessed:
  - Taxonomy
  - Occurrence data
  - Range polygons
  - Predicted Habitat Models
  - Threats
  - Host Plant Relationships
- Status Rank Assessments
  - Bombus complete
  - Targeting completion of aquatic invertebrates, assessed moths and butterflies over next few years
- How would you use host plant information?

Projects

- Northern Myotis
  - No confirmed captures*
- NABat
  - 95 cells, 376 sites
  - Upload of data 2020-2024 to National NABat portal completed
- SOC Bioacoustics
  - Developing capacity to analyze bird acoustic data

Updates to Species Names

Birds

- Warbling-Vireo split to Western (*Vireo swainsoni*) and Eastern Warbling-Vireo (*Vireo gilvus*)
- Accipiter to Astur
  - Cooper's Hawk *Astur cooperii*
  - American Goshawk *Astur atricapillus*

Mammals

- Hayden's Shrew to Prairie Shrew
- Water Vole to North American Water Vole

Fish

- Mountain Sucker (*Catostomus platyrhynchus*) to Plains Sucker (*Pantosteus Jordani*)
- Cutthroat trout now two species
  - Rocky Mountain Cutthroat Trout (*Oncorhynchus virginalis*)
  - West Slope Cutthroat Trout (*Oncorhynchus lewisi*)

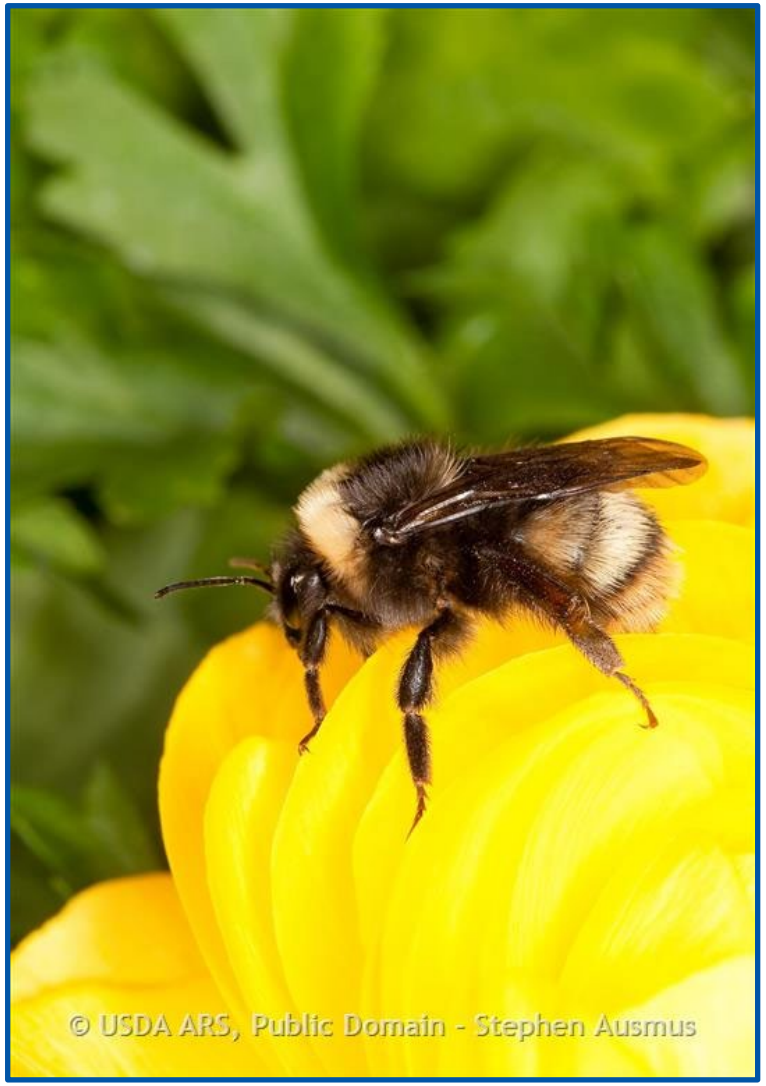
Federal Status Updates

US Fish and Wildlife Service:

- Pollinators – status under review
  - Regal Fritillary
  - Western Bumble Bee
  - Suckley Cuckoo Bumble Bee
  - Iowa Skipper
- Bats - status under review
  - Little Brown Myotis
  - Hoary Bat

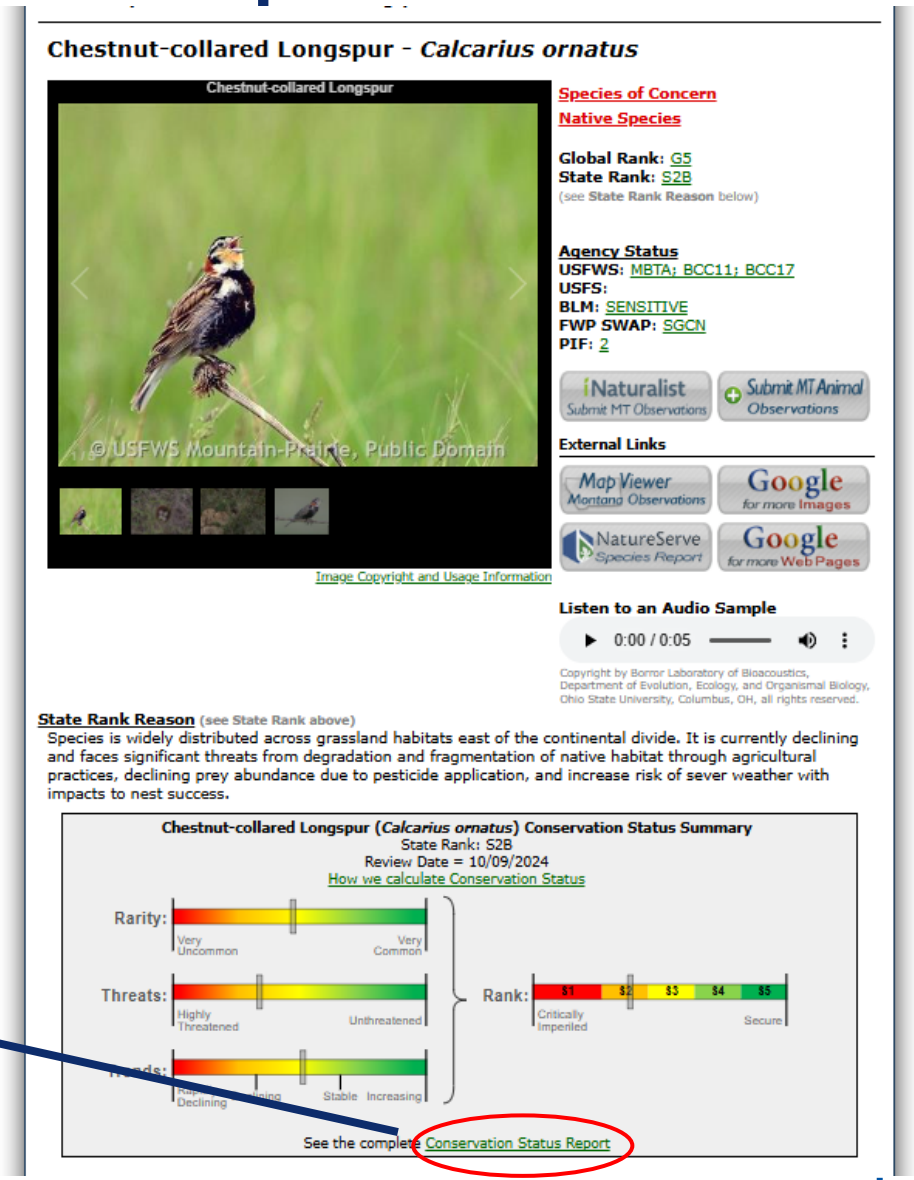
Montana Status Updates

- Invertebrates
  - Bumblebees are ranked
  - SOC
    - Suckley's Cuckoo Bumble Bee (S2)
    - Yellow-banded Bumble Bee (S2)
    - Western Bumble Bee (S2)
    - American Bumble Bee (S3)
  - PSOC
    - Indiscriminate Cuckoo Bumble Bee (S3S4)
- No Adjustments to vertebrates
  - Pending SOC Meeting spring 2026
- Revised SGCN list from SWAP available



Ranking Database Updates

- Vertebrates are done!
- Reports posted on Field Guide
- Upcoming Ranking Efforts
  - Moths
  - Aquatic invertebrates
- Integrate SWAP threats



Chestnut-collared Longspur - *Calcarius ornatus*

Chestnut-collared Longspur

Image Copyright and Usage Information

Species of Concern
Native Species

Global Rank: G5
State Rank: S2B
(see **State Rank Reason** below)

Agency Status
USFWS: MBTA; BCC11; BCC17
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN
PIF: 2

iNaturalist Submit MT Observations | Submit MT Animal Observations

External Links

Map Viewer Montana Observations | Google for more Images
NatureServe Species Report | Google for more Web Pages

Listen to an Audio Sample

0:00 / 0:05

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State Rank Reason (see State Rank above)
Species is widely distributed across grassland habitats east of the continental divide. It is currently declining and faces significant threats from degradation and fragmentation of native habitat through agricultural practices, declining prey abundance due to pesticide application, and increase risk of sever weather with impacts to nest success.

Chestnut-collared Longspur (*Calcarius ornatus*) Conservation Status Summary
State Rank: S2B
Review Date = 10/09/2024
How we calculate Conservation Status

See the complete Conservation Status Report

Chestnut-collared Longspur (*Calcarius ornatus*)
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
Rarity					
Range Extent	2024-04-23	S: 254055.2 km²	4.710	MTNHP Range	None

Summary of Conservation Status Rank Factors for Species in Montana

The NatureServe Network uses standardized protocols to assess the conservation status of species and habitats at global and subnational scales. This flexible assessment protocol evaluates rank factors in three major categories:

- **Rarity** – how widespread and/or common the species or habitat is currently
- **Trends** – trends in the rarity factors over the last 10 years or 3 generations (short term) or 200 years (long term)
- **Threats** – the severity, scope, timing, and overall impact of anthropogenic or natural threats

See scoring and information sources for these rank factors for individual species in Montana Field Guide accounts.

The links below allow you to explore patterns in conservation status rank factor scoring across taxonomic groups for Rarity, Trends, and Threats as well as between these major rank factor categories to allow natural resource managers to prioritize limited funding on conservation actions that address multiple species and habitats at a time.

Choose a category below to begin:

- See this Introductory Video
- Click "Refresh Data in this View" at bottom left to reset filters or if pop-up views are frozen
- Click here for how we assign conservation status rank factors and ranks

Explore by Rarity | **Explore by Trends** | **Explore by Threat** | **Explore by Threat Impact and Short-term Trend**

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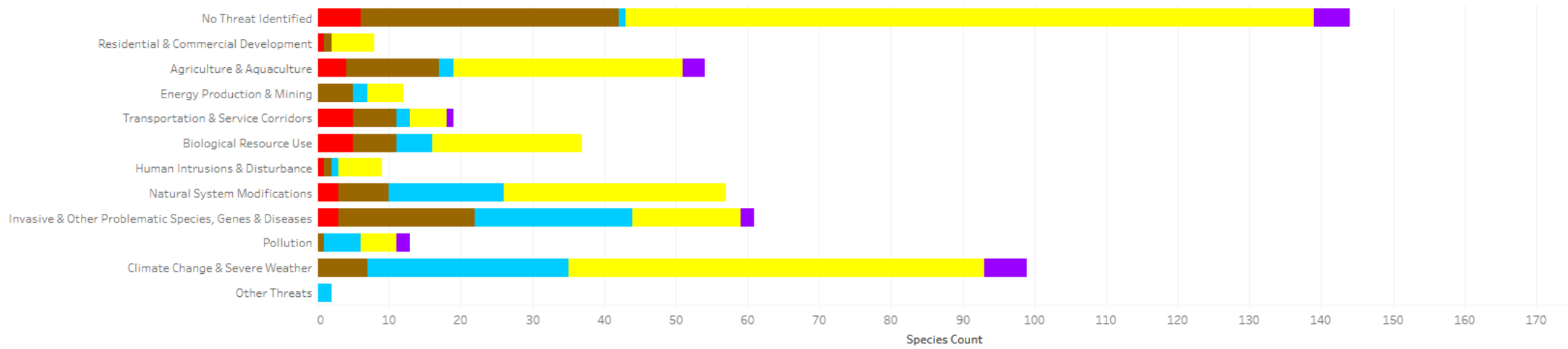
Conservation Status - Threats

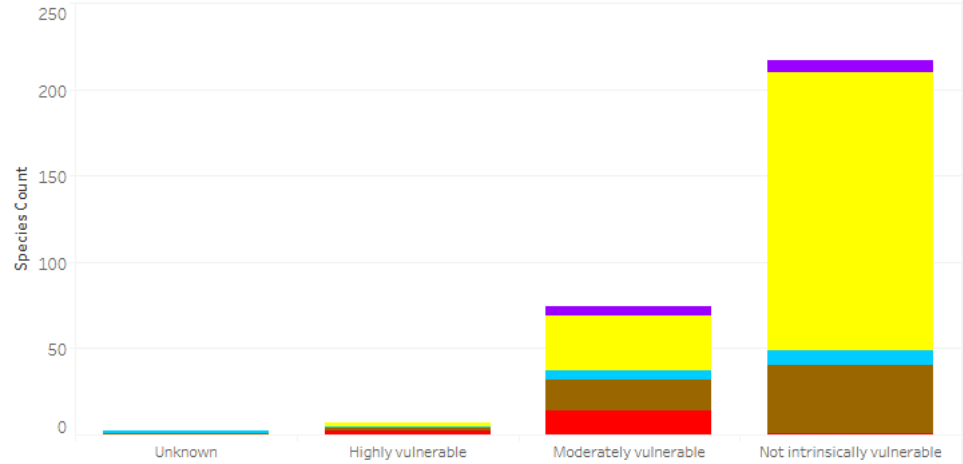
*See scoring and information sources for these rank factors for individual species in Montana Field Guide accounts.

Return to Main Page

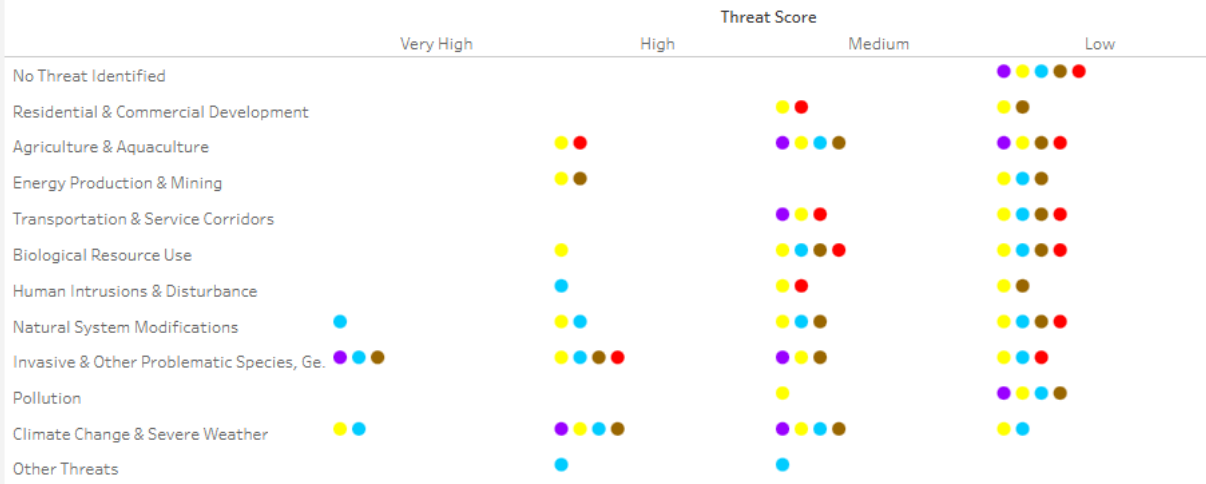
Threats



Intrinsic Vulnerability



Threat Type vs Threat Score



Species Group

- Amphibians
- Birds
- Fish
- Mammals
- Reptiles

Montana Status

- (•) Display All
- ( ) Not Listed
- ( ) PSOC
- ( ) SOC
- ( ) SSS

SWAP Status

- (•) Display All
- ( ) Not Listed
- ( ) SGCN
- ( ) SGIN

Species Global Rank

- G1
- G2
- G3
- G4
- G5
- GNA
- GNR

Species State Rank

- S1
- S2
- S3
- S4
- S5
- SNA
- SU
- SX

Download PDF

Conservation Status - Threat Impact and Short-term Trend

*See scoring and information sources for these rank factors for individual species in Montana Field Guide accounts.

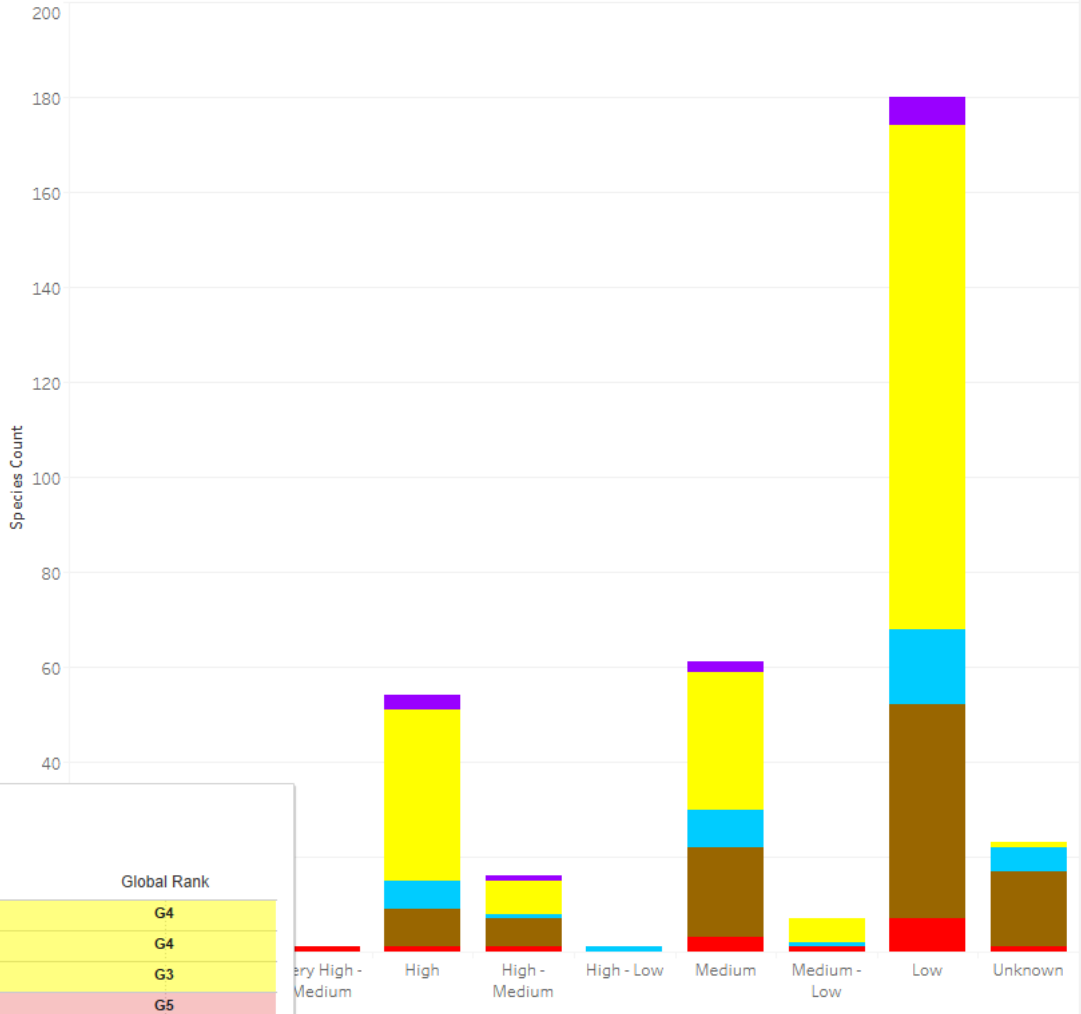
Return to Main Page

Threat Impact vs Short-term Trend

Threat Impact: Very High - High
Short Term Trend Score High:
Short Term Trend Score Low:

Scientific Name	Common Name	MT Status	State Rank	Global Rank
Cypseloides niger	Black Swift	SOC	S2B	G4
Histrionicus histrionicus	Harlequin Duck	SOC	S2B	G4
Anarhynchus montanus	Mountain Plover	SOC	S2B	G3
Heterodon nasicus	Plains Hog-nosed Snake	SOC	S2	G5

Threat Impact



Species Group
- Amphibians
- Birds
- Fish
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- Reptiles

Montana Status
- Display All
- Not Listed
- PSOC
- SOC
- SSS

SWAP Status
- Display All
- Not Listed
- SGCN
- SGIN

Species Global Rank
- G1
- G2
- G3
- G4
- G5
- GNA
- GNR

Species State Rank
- S1
- S2
- S3
- S4
- S5
- SNA
- SU
- SX

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Share

Adaptive Capacity

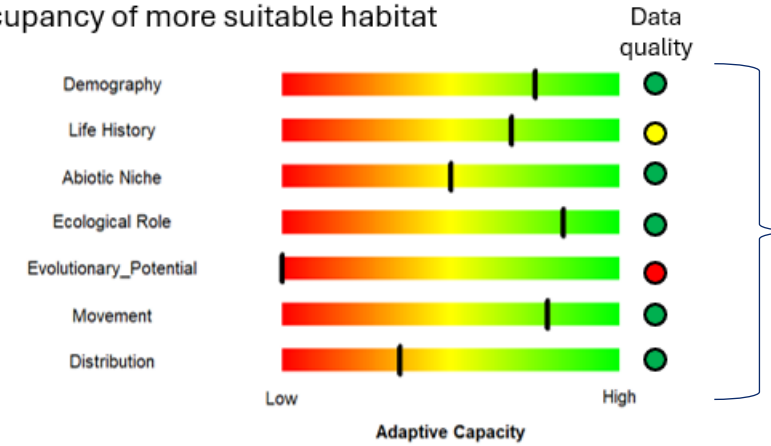
- Capacity of a species to adapt in situ or move to find suitable habitat
- Based on NatureServe and USGS methods
- Data:
  - Distribution
  - Life History and Ecology
  - Applicable to landscape level change
- Provides insight into how managers can support species
- Vertebrates completed in 2026

Adaptive Capacity

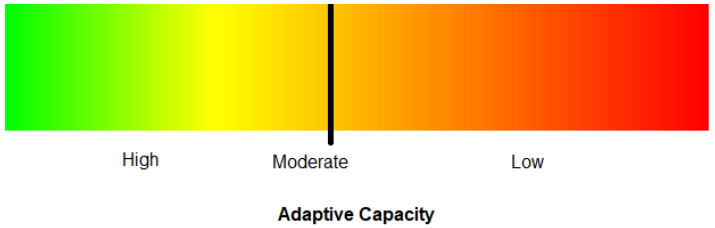
Field Guide Summary

Adaptive Capacity

Species ability to adapt to widespread changes in habitat through flexibility in life history or movement to and occupancy of more suitable habitat



View full report for further details



Species has a score of Moderately Low Adaptive Capacity indicating that it may not adapt well to climate change and may struggle to adapt to other threats it faces in Montana.

Report Examples

Movement

Factor	Adaptive Capacity	Score	Comments
Dispersal Syndrome	Low	4	Swifts show high nest site fidelity, but have been documented to disperse to new sites if previous sites are no longer suitable
Dispersal Distance	Moderate- High	1	species has substantial movement capability, but exhibits a moderate to high degree of site fidelity and has very limited existing or potential habitat within the assessment area
Dispersal Phase	High	0	Species may disperse to new nest sites throughout its life
Site Fidelity	Low	4	Species has high fidelity to nest sites
Migration Frequency	High	0	Annual migration
Migration Demography	Low	4	All individuals migrate in Montana
Migration Timing	High	0	Migration cues are thought to be biotic and abiotic and are likely flexible.
Migration Distance	Low	4	Species overwinters in central and South America
17 total points / 32 possible points = 0.53			

Low AC High AC

Demography

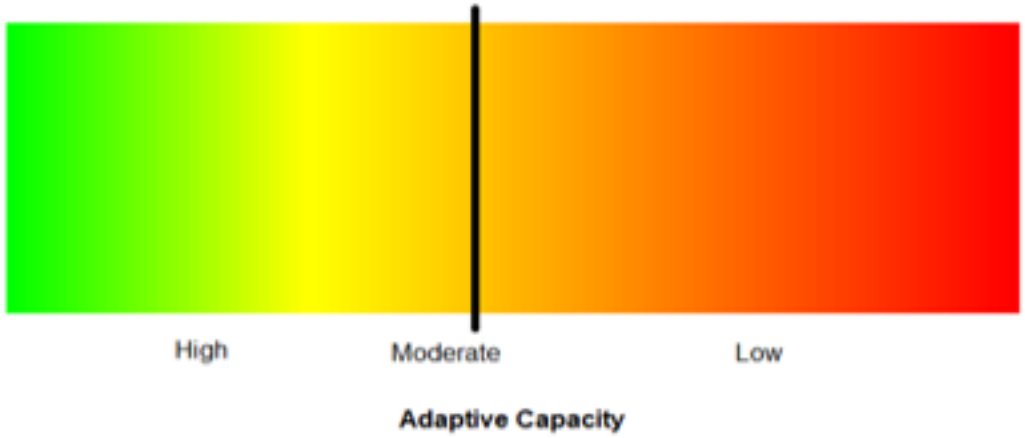
Factor	Adaptive Capacity	Score	Comments
Life Span	Moderate-Low	3	Species can live between 10-20 years
Generation Time	Moderate-High	1	Generation time is likely between 3-5 years
Age of Sexual Maturity	Moderate	2	Species matures in 3-5 years (~1/3 of lifespan). Assessed as Moderate but could be High.
Age Structure	Moderate	2	Poorly documented but populations may have a relatively balanced age structure
Recruitment	Unknown	-	Unknown
8 total points/ 16 possible points = 0.5			

Low AC High AC

Calculation of Adaptive Capacity

The adaptive capacity score of a species is calculated as the sum of each module score.

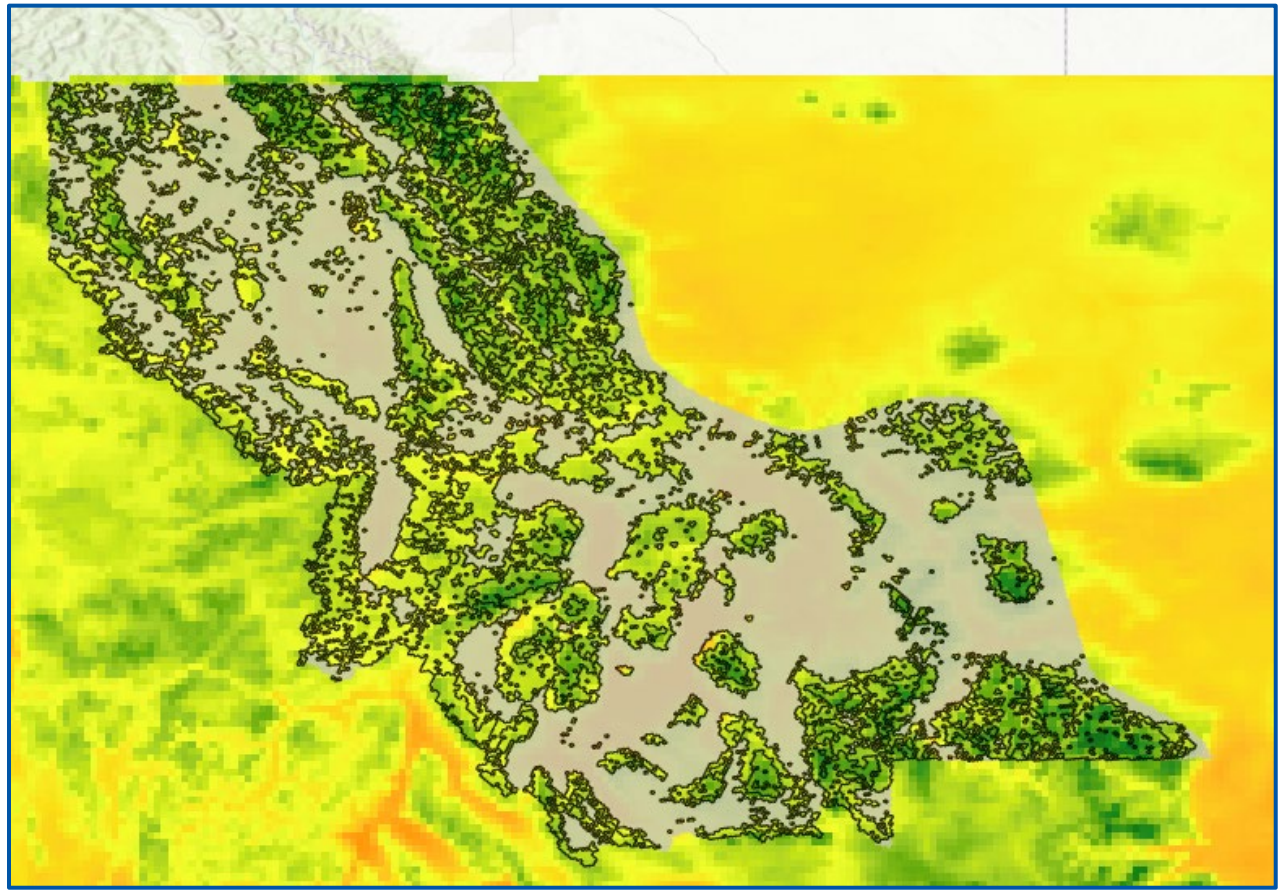
Module	Score
Distribution	0.35
Movement	0.53
Evolutionary Potential	0.88
Ecological Role	0
Abiotic Niche	0.7
Life History	0.34
Demography	0.5
Sum = 3.3	



Black Swift has a score of Moderately Low Adaptive Capacity indicating that it may not adapt well to climate change and may struggle to adapt to other threats it faces in Montana.

Spatial Threats

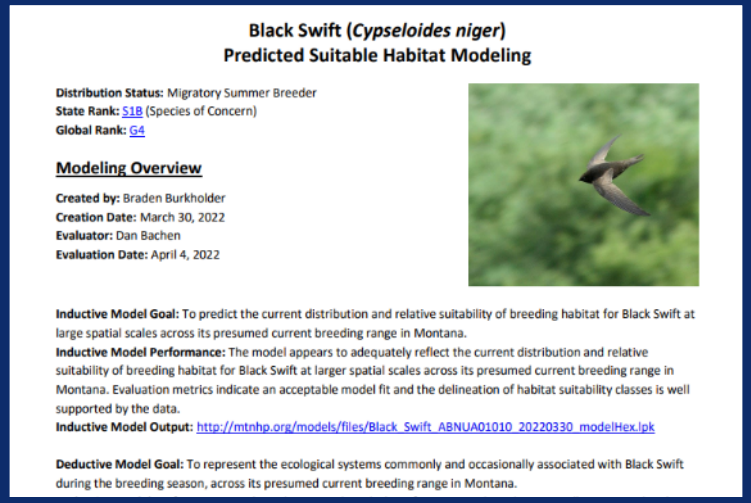
- Threat data are available
- Threats have a spatial component
- Combine predicted habitat suitability with threat exposure layers
- Identify where threats are most likely to impact species
- Potential Spatial Threats
  - Climate change exposure
  - Fire
  - Habitat conversion
  - Urbanization
  - Invasive species
  - Others?



Predicted 20-year change in temperature and precipitation with American Pika Predicted Habitat Model overlayed. Warmer colors are more different from current conditions

Field Guide

Predicted Suitable Habitat Model



Black Swift (*Cypseloides niger*)
Predicted Suitable Habitat Modeling

Distribution Status: Migratory Summer Breeder
State Rank: S1B (Species of Concern)
Global Rank: G4

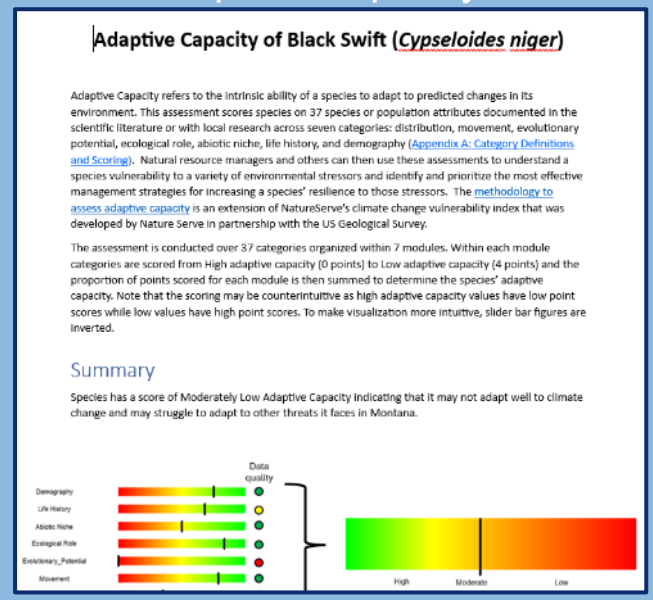
Modeling Overview

Created by: Braden Burkholder
Creation Date: March 30, 2022
Evaluator: Dan Bachen
Evaluation Date: April 4, 2022

Inductive Model Goal: To predict the current distribution and relative suitability of breeding habitat for Black Swift at large spatial scales across its presumed current breeding range in Montana.
Inductive Model Performance: The model appears to adequately reflect the current distribution and relative suitability of breeding habitat for Black Swift at larger spatial scales across its presumed current breeding range in Montana. Evaluation metrics indicate an acceptable model fit and the delineation of habitat suitability classes is well supported by the data.
Inductive Model Output: http://mtnhp.org/models/files/Black_Swift_ABNUA01010_20220330_modelHex.lpk

Deductive Model Goal: To represent the ecological systems commonly and occasionally associated with Black Swift during the breeding season, across its presumed current breeding range in Montana.

Adaptive Capacity



Adaptive Capacity of Black Swift (*Cypseloides niger*)

Adaptive Capacity refers to the intrinsic ability of a species to adapt to predicted changes in its environment. This assessment scores species on 37 species or population attributes documented in the scientific literature or with local research across seven categories: distribution, movement, evolutionary potential, ecological role, abiotic niche, life history, and demography (Appendix A: Category Definitions and Scoring). Natural resource managers and others can then use these assessments to understand a species vulnerability to a variety of environmental stressors and identify and prioritize the most effective management strategies for increasing a species' resilience to those stressors. The methodology to assess adaptive capacity is an extension of NatureServe's climate change vulnerability index that was developed by Nature Serve in partnership with the US Geological Survey.

The assessment is conducted over 37 categories organized within 7 modules. Within each module categories are scored from High adaptive capacity (0 points) to Low adaptive capacity (4 points) and the proportion of points scored for each module is then summed to determine the species' adaptive capacity. Note that the scoring may be counterintuitive as high adaptive capacity values have low point scores while low values have high point scores. To make visualization more intuitive, slider bar figures are inverted.

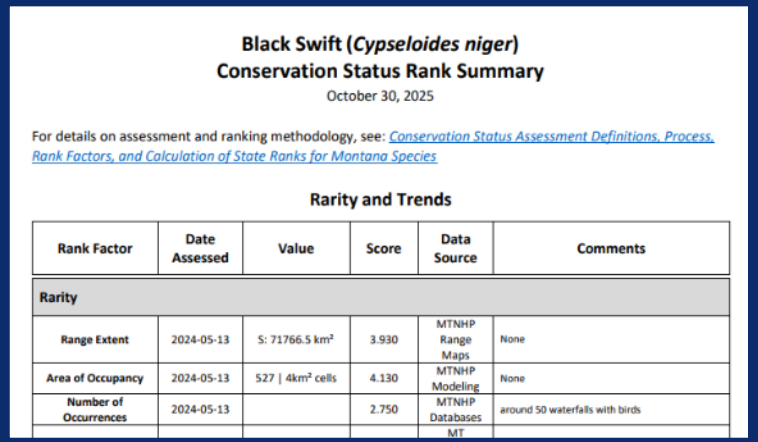
Summary

Species has a score of Moderately Low Adaptive Capacity indicating that it may not adapt well to climate change and may struggle to adapt to other threats it faces in Montana.

Data quality
Demography
Life History
Abiotic Niche
Ecological Role
Evolutionary_Potential
Movement
High
Moderate
Low

Existing Products

Conservation Status Rank



Black Swift (*Cypseloides niger*)
Conservation Status Rank Summary
October 30, 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

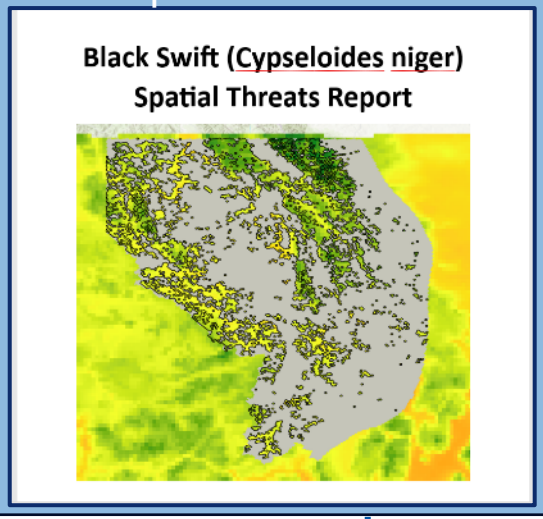
Rank Factor	Date Assessed	Value	Score	Data Source	Comments
Rarity					
Range Extent	2024-05-13	S: 71766.5 km²	3.930	MTNHP Range Maps	None
Area of Occupancy	2024-05-13	527 | 4km² cells	4.130	MTNHP Modeling	None
Number of Occurrences	2024-05-13		2.750	MTNHP Databases	around 50 waterfalls with birds
				MT	

Comprehensive Species Conservation Report

Single source for all conservation data and assessments

Future Products

Spatial Threats



Black Swift (Cypseloides niger)
Spatial Threats Report

Questions?

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