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MONTANA STATE LIBRARY
NATURAL HERITAGE PROGRAM

Zoology Program Update

Dan Bachen – October 8th, 2026

Representing Montana's Animal Taxa



652 VERTEBRATES



191 Molluscs





Pollinators!

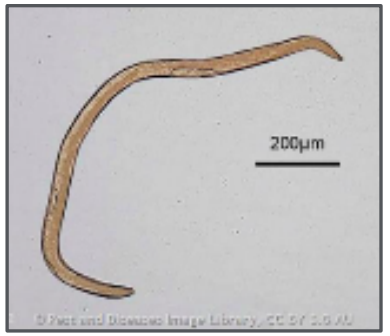
6,858 Arthropods → 12-15,000??



36 Annelids



12 PLATYHELMINTHES



31 Nematodes



4 PORIFERANS



9 ROTIFERS



2 CNIDARIA



23 Tardigrades

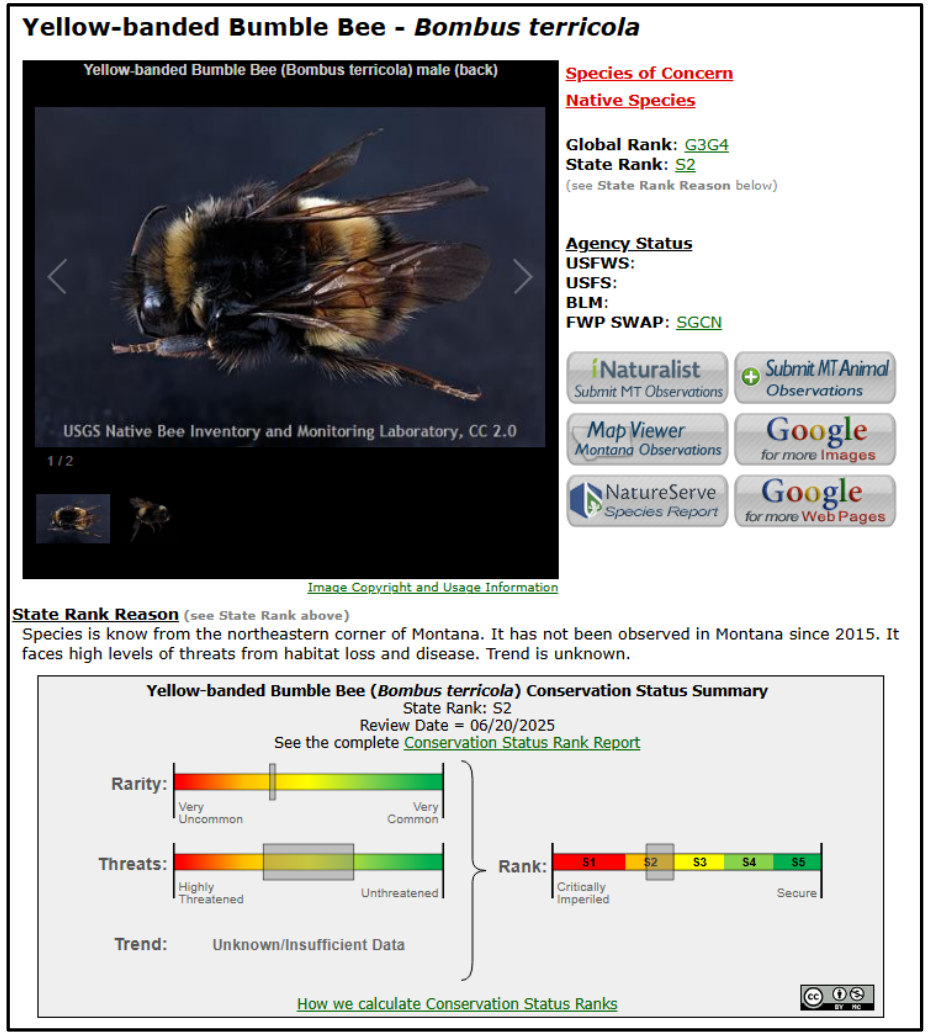
NEMATOPHORA?
BRYOZOA?
NEMERTEA?

ENTOPROCTA?
GASTROTRICHA?

~8,000 SPECIES…A LONG WAY TO GO!

Increasing Invertebrate Information

- Ongoing partnership with invertebrate experts
  - Montana Biological Survey, 1,671 aquatic invertebrates
    - Full representation of group
    - Stream Communities
  - EntoQuest Solutions, 1,143 moths
  - Xerces Society, 350 butterflies and 32 Bumblebees
- Assessed:
  - Taxonomy
  - Occurrence data
  - Range polygons
  - Predicted Habitat Models
  - Threats
  - Host Plant Relationships



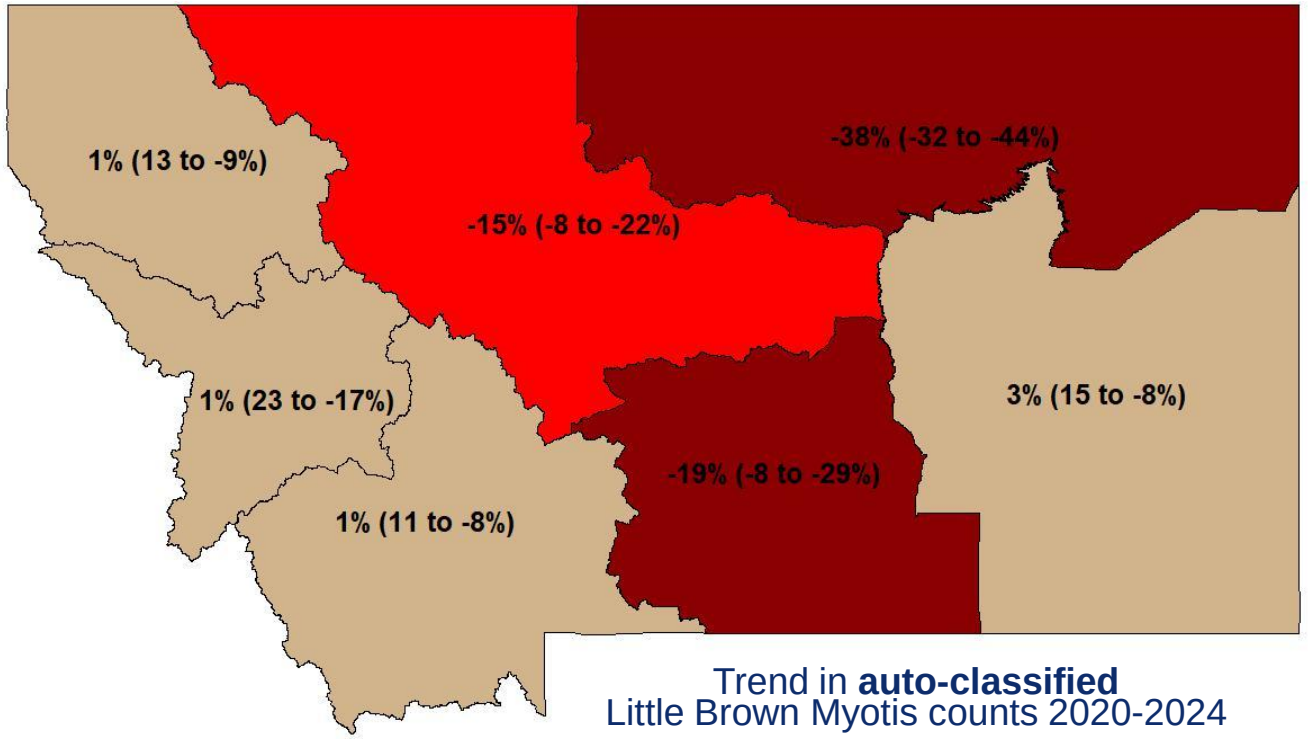
Projects

- NABat
  - 95 cells, 380 sites
  - 2020 – 2026
  - 4,946,557 calls recorded
- WNS sensitive species trend
- SOC Bioacoustics
- Northern Myotis



Trends for White-Nose Sensitive Bats from NABat Data

- Exploration of activity by auto-classified species
- WNS and impacts on Activity WNS species
  - Montana extension of Stratton et al. with 2023-2025 data
  - Application of methods across most of the Western US



Trend in **auto-classified** Little Brown Myotis counts 2020-2024

USGS science for a changing world

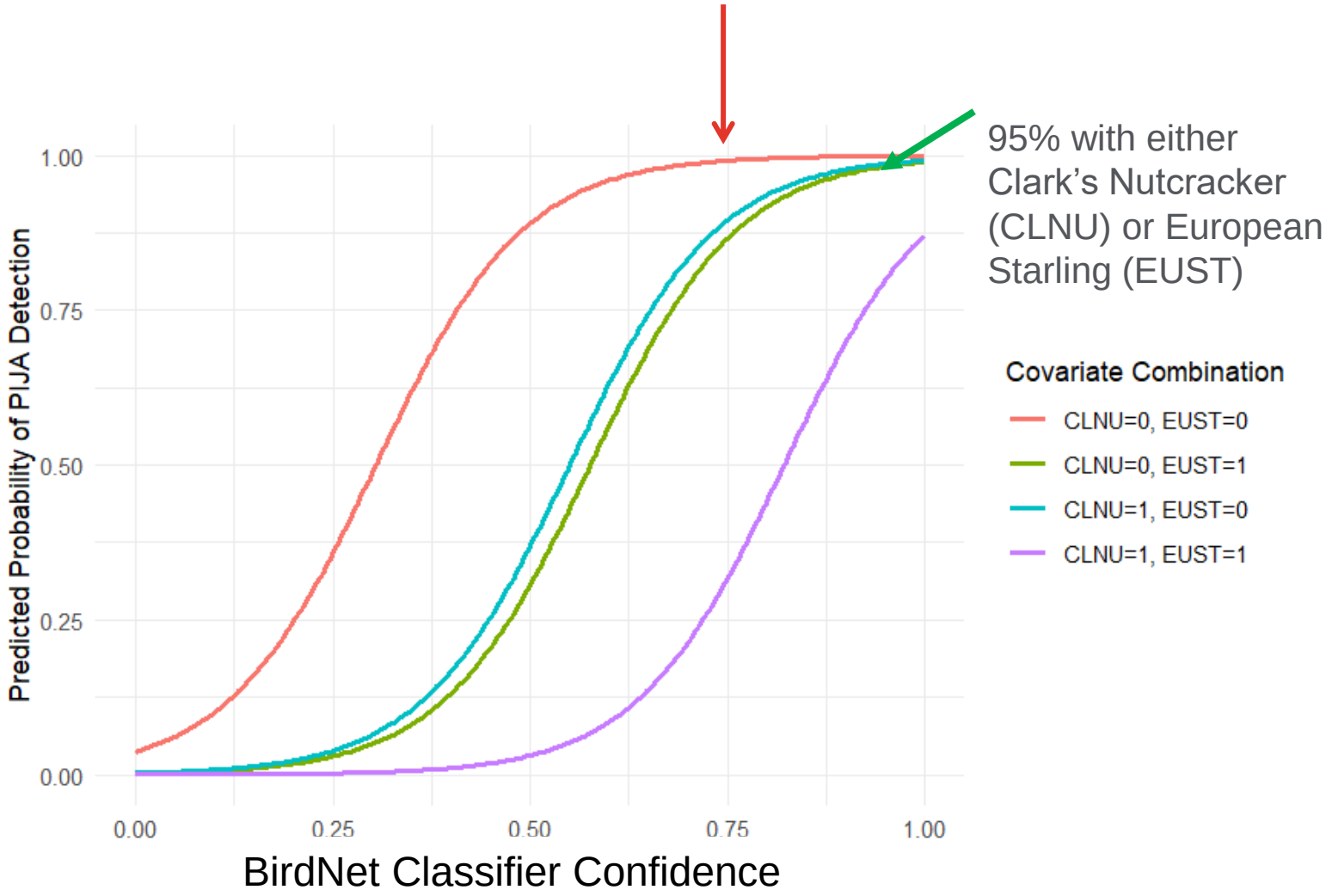
MONTANA FISH, WILDLIFE & PARKS

MONTANA STATE UNIVERSITY

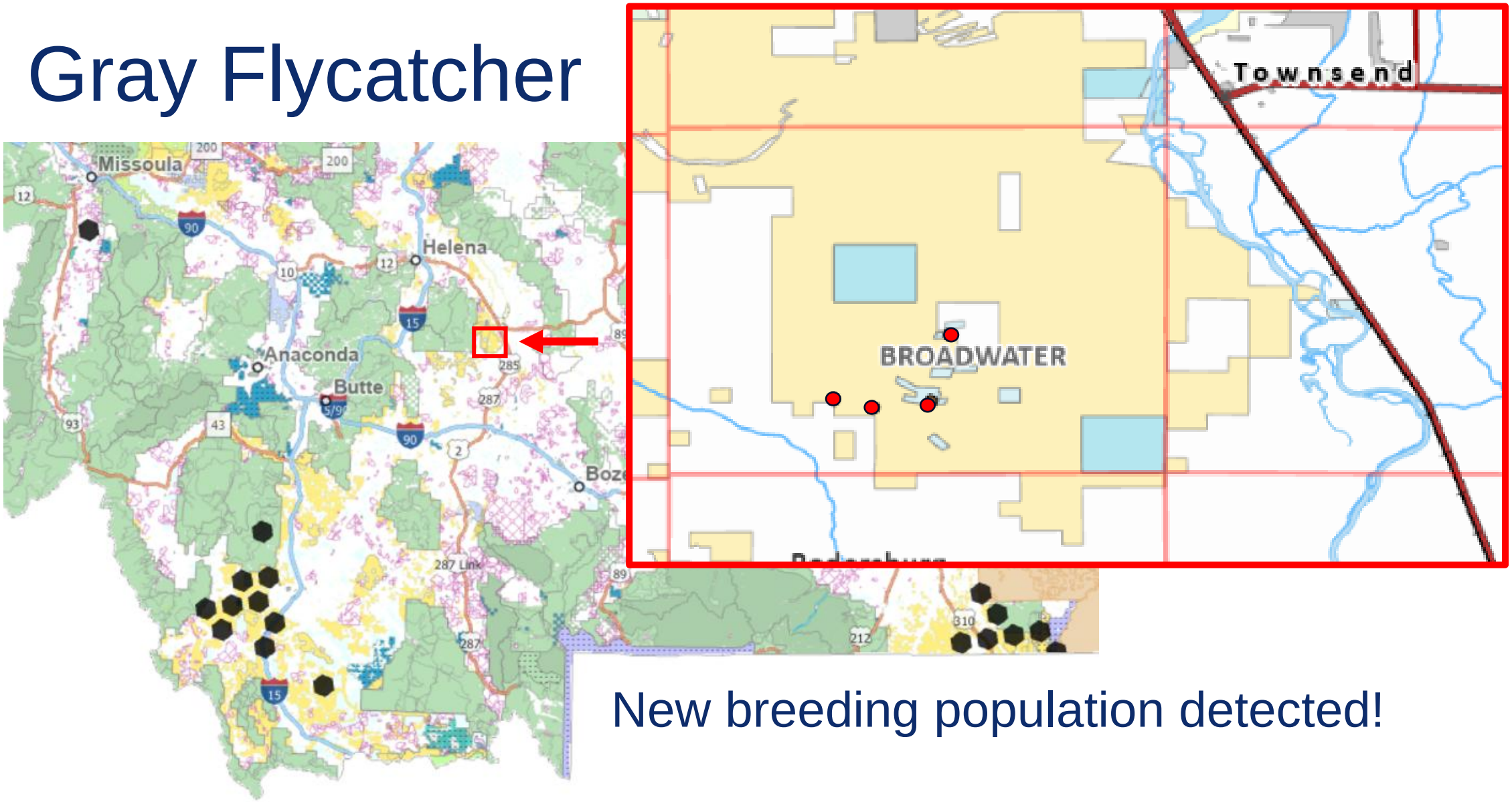
Pinyon Jay Acoustics

- Under Review for Listing as Threatened under the ESA
- Acoustic Recorder Unit Data from Department of Military Affairs lands near Helena 2024 and 2025
- Classifier performed well!
- Useful tool for transient bird species that are difficult to detect with point counts

Pinyon Jay (PIJA) present when confidence > 75%
(without classifier detection of confounding species)

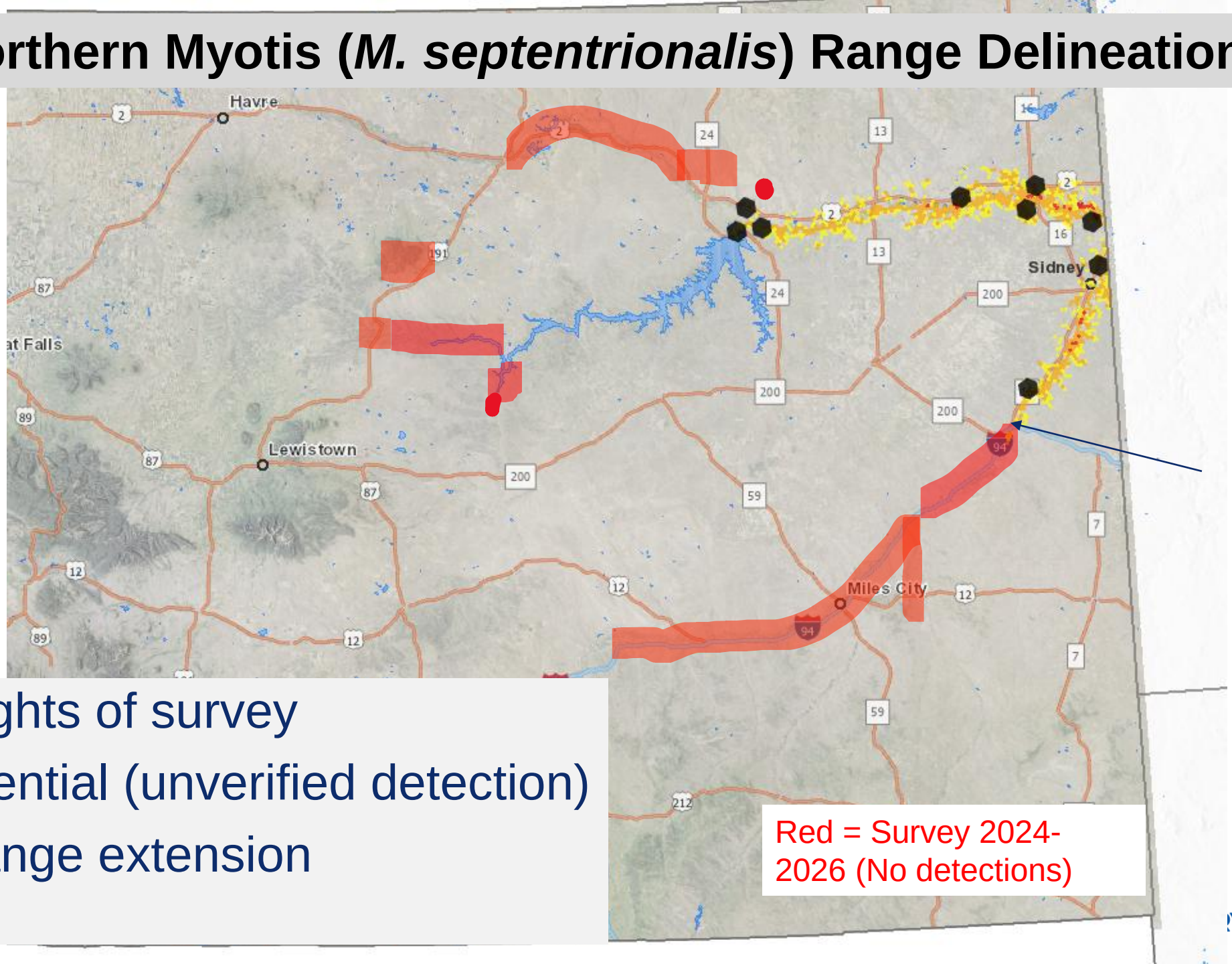


Gray Flycatcher



New breeding population detected!

Northern Myotis (*M. septentrionalis*) Range Delineation



- 77 nights of survey
- 1 potential (unverified detection)
- No range extension

Federal Status Updates

US Fish and Wildlife Service:

- Pollinators – Proposed Threatened
  - **Regal Fritillary**
- Pollinators – Proposed Endangered
  - **Suckley's Cuckoo Bumble Bee**
- Pollinators – status under review
  - **American Bumble Bee**
  - **Western Bumble Bee**
  - ~~Iowa Skipper~~
- Bats - status under review
  - ~~Little Brown Myotis~~
  - ~~Hoary Bat~~
- Birds- status under review
  - **Pinyon Jay**
- Mammals –Status under review
  - ~~Pygmy Rabbit~~





Montana Status Updates

- PSOC is now SOPC
- Vertebrates
  - Eastern Screech Owl - SOC Addition
  - Western Screech Owl - SOC Addition
  - Cassin’s Finch - Removed from SOC
  - Green-tailed Towhee - Removed from SOC
  - Uinta Chipmunk - SU SGIN
  - Spotted Bat - SU SGIN
  - North American Water Vole - Removed from SOPC
- Threats data from SWAP integrated into Species Status Assessments



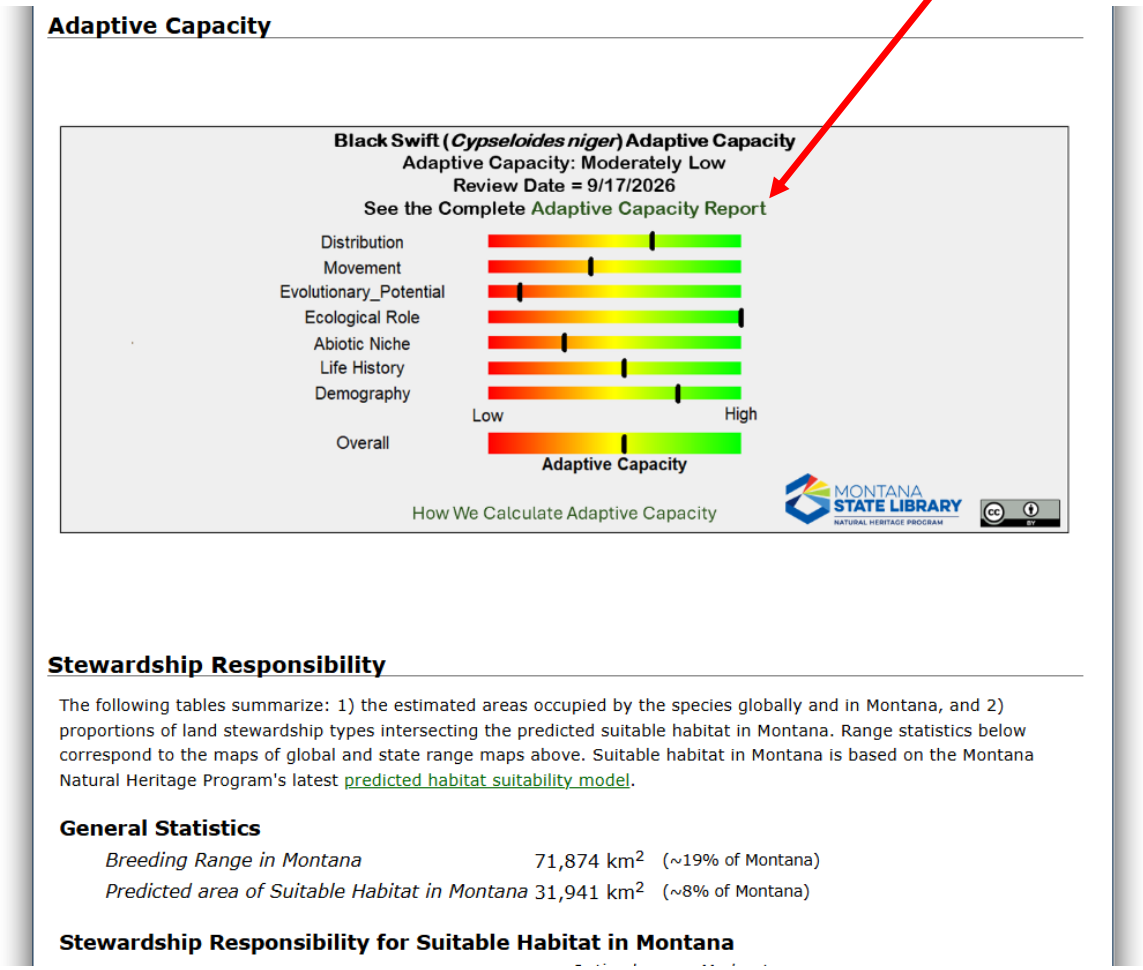
Adaptive Capacity

- Capacity of a species to adapt in situ or move to find suitable habitat
- Based on NatureServe and USGS methods
- Vertebrates in Progress


Photo credit: iNat user jwboreal

Report Examples Available

- Reports currently in Comprehensive Report on the Field Guide
- Adaptive Capacity section added
- Species
  - Idaho Giant Salamander
  - Northern Bog Lemming
  - Black Swift
- Full vertebrate representation in spring 2027



Adaptive Capacity

Black Swift (*Cypseloides niger*) Adaptive Capacity
Adaptive Capacity: Moderately Low
Review Date = 9/17/2026
See the Complete Adaptive Capacity Report

Distribution
Movement
Evolutionary_Potential
Ecological Role
Abiotic Niche
Life History
Demography
Low
High
Overall
Adaptive Capacity

How We Calculate Adaptive Capacity

MONTANA STATE LIBRARY NATURAL HERITAGE PROGRAM

Stewardship Responsibility

The following tables summarize: 1) the estimated areas occupied by the species globally and in Montana, and 2) proportions of land stewardship types intersecting the predicted suitable habitat in Montana. Range statistics below correspond to the maps of global and state range maps above. Suitable habitat in Montana is based on the Montana Natural Heritage Program's latest predicted habitat suitability model.

General Statistics

Breeding Range in Montana	71,874 km^2	(~19% of Montana)
Predicted area of Suitable Habitat in Montana	31,941 km^2	(~8% of Montana)

Stewardship Responsibility for Suitable Habitat in Montana

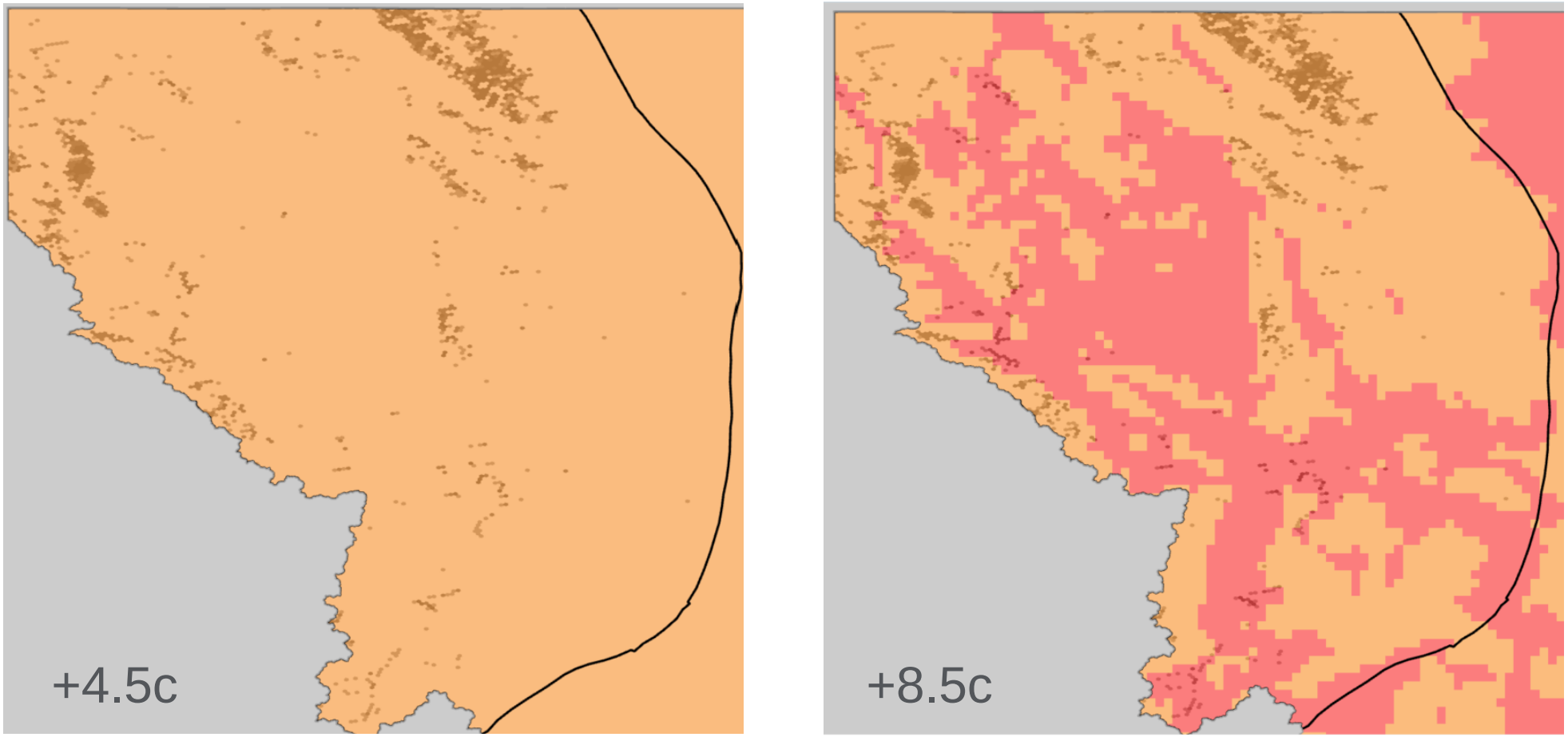
Movement

Factor	Score	Numeric	Comments
Dispersal Syndrome	High	0	Not well documented but species can disperse in both terrestrial and aquatic environments. Dispersal is unlikely to rely on fixed cues.
Dispersal Distance	Moderate-low	3	Habita patches are isolated and dispersal between patches appears unlikely based on current understanding of the species
Dispersal Phase	Low	4	Dispersal is primarily by juveniles
Site Fidelity	Low	4	Species shows strong site fidelity
Migration Frequency			
Migration Demography			
Migration Timing			
Migration Distance			

Demography

Factor	Score	Numeric	Comments
Life Span	Moderate-High	1	Species may live 1-3 years
Generation Time	High	0	Less than 1 year
Age of Sexual Maturity	Moderate	2	Species matures in several months
Age Structure	High	0	Biased toward younger individuals
Recruitment	Unknown		
3 total points/ 16 possible points = 0.1875			

Report Includes Spatial Climate Threat

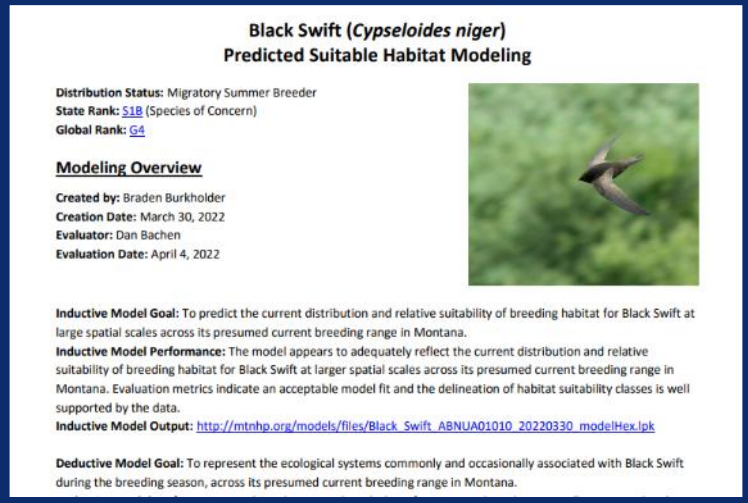


Spatial impacts on temperature and precipitation under 4.5C and 8.5C warming scenarios with Predicted Suitable Habitat

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

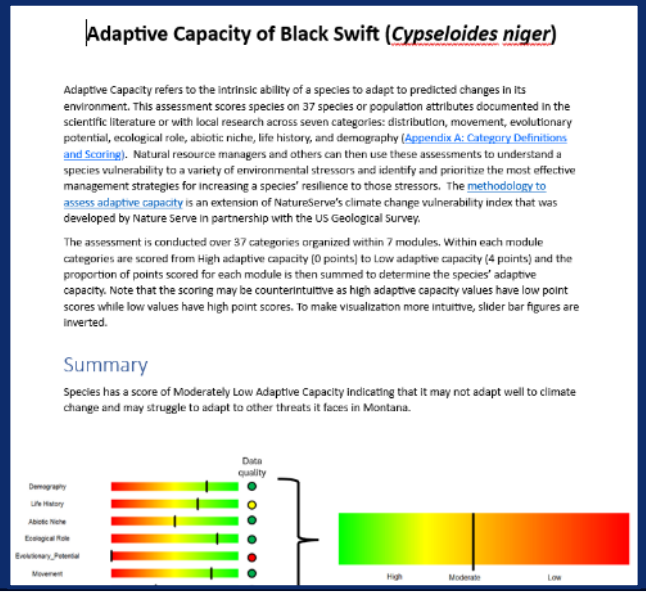
Deductive Model Goal: To represent the ecological systems commonly and occasionally associated with Black Swift during the breeding season, across its presumed current breeding range in Montana.

Existing Products

Comprehensive Species Report

Single source for all data and assessments

Adaptive Capacity



Adaptive Capacity of Black Swift (*Cypseloides niger*)

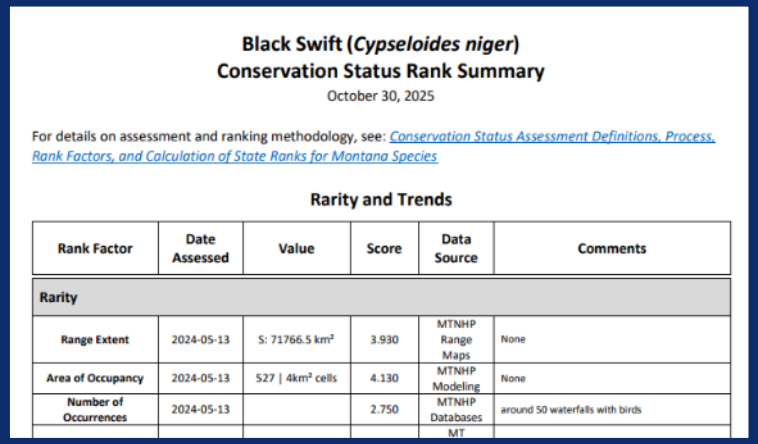
Adaptive Capacity refers to the intrinsic ability of a species to adapt to predicted changes in its environment. This assessment scores species on 37 species or population attributes documented in the scientific literature or with local research across seven categories: distribution, movement, evolutionary 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.

Conservation Status Rank



Black Swift (*Cypseloides niger*)
Conservation Status Rank Summary
October 30, 2025

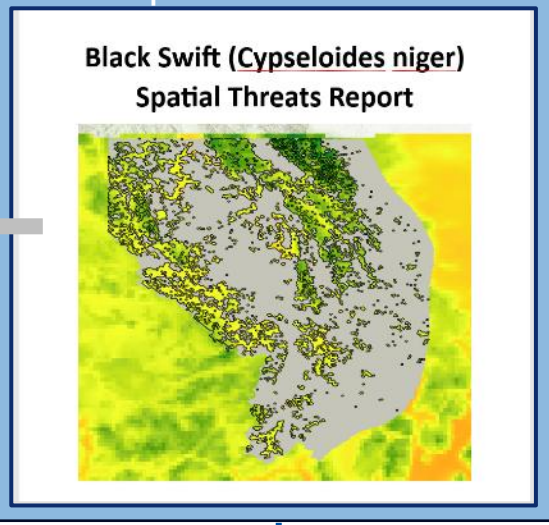
For details on assessment and ranking methodology, see: *Conservation Status Assessment Definitions, Process, Rank Factors, and Calculation of State Ranks for Montana Species*

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	

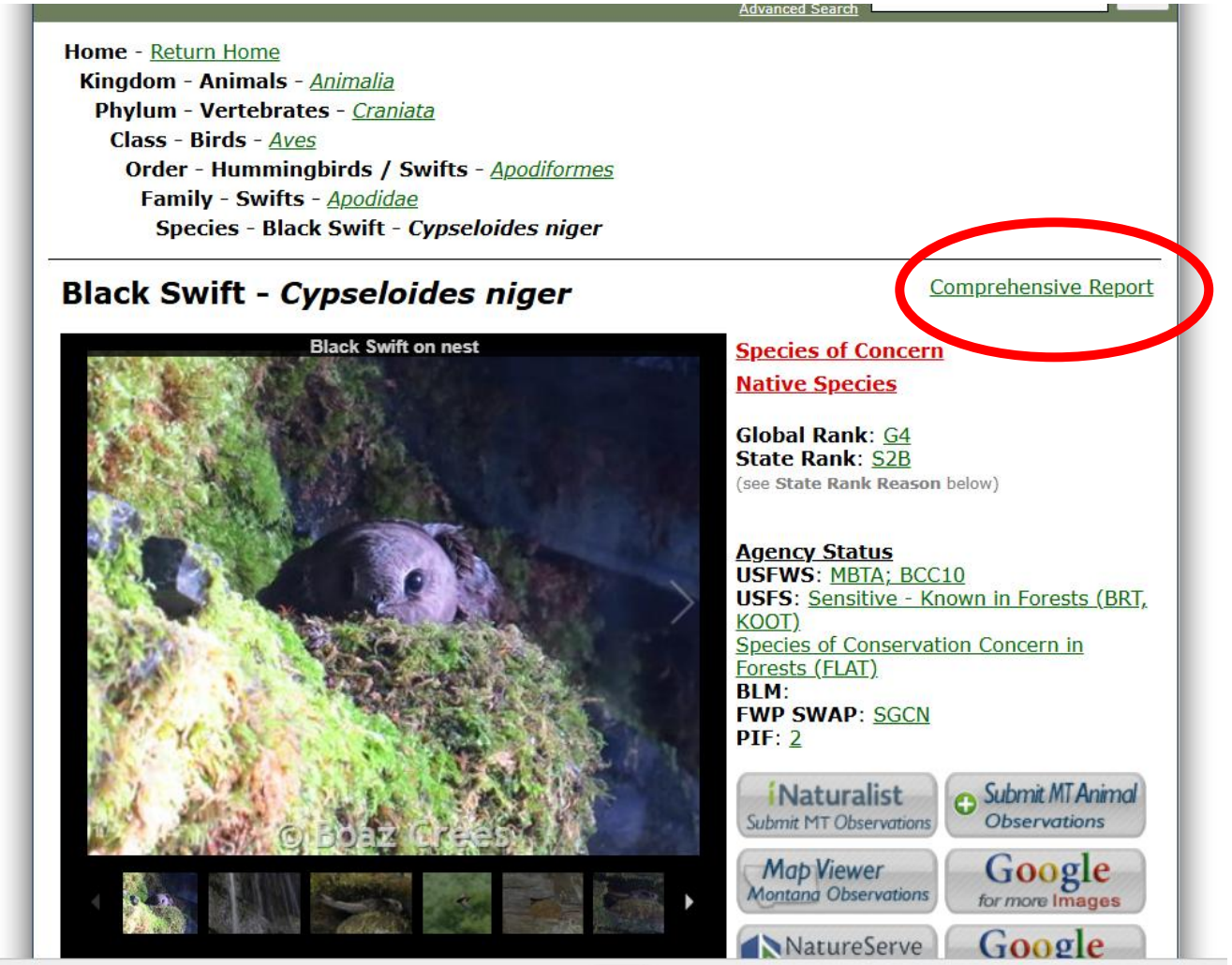
Future Products

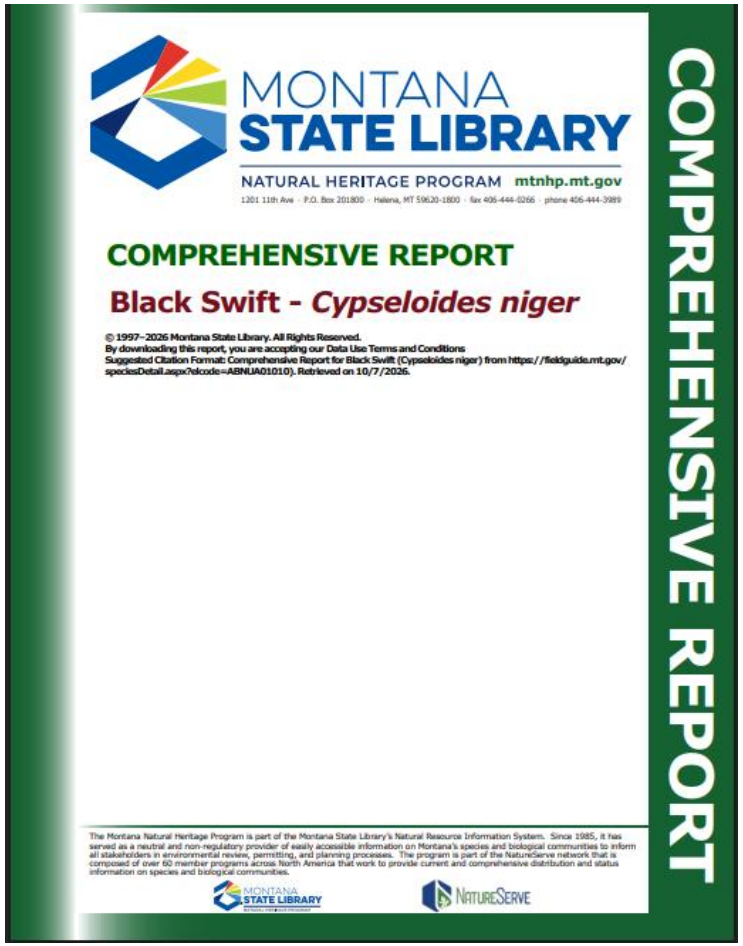
Spatial Threats



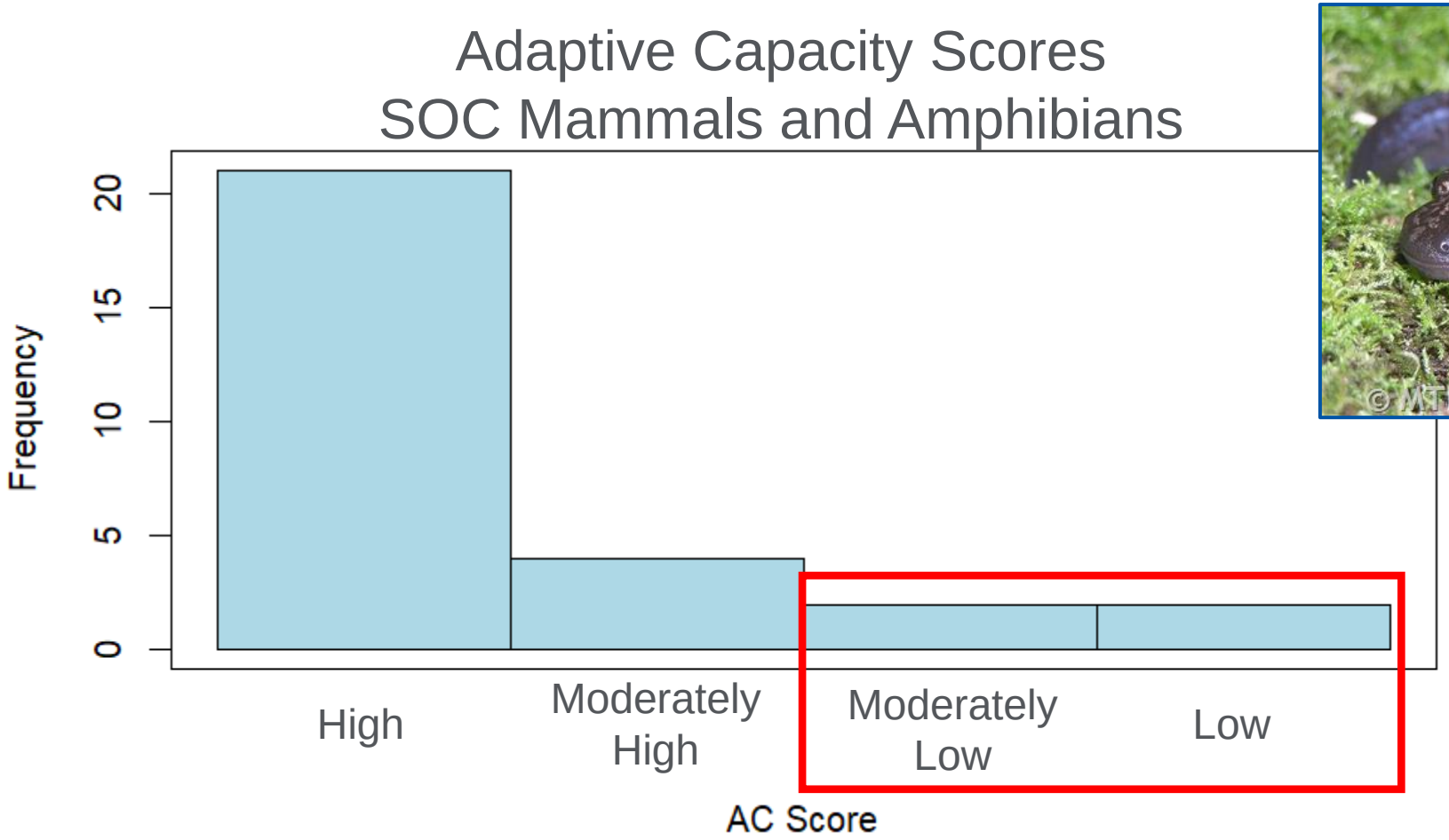
Black Swift (Cypseloides niger)
Spatial Threats Report

Comprehensive Report Example





Adaptive Capacity Across Taxa











Factors Important for Conservation

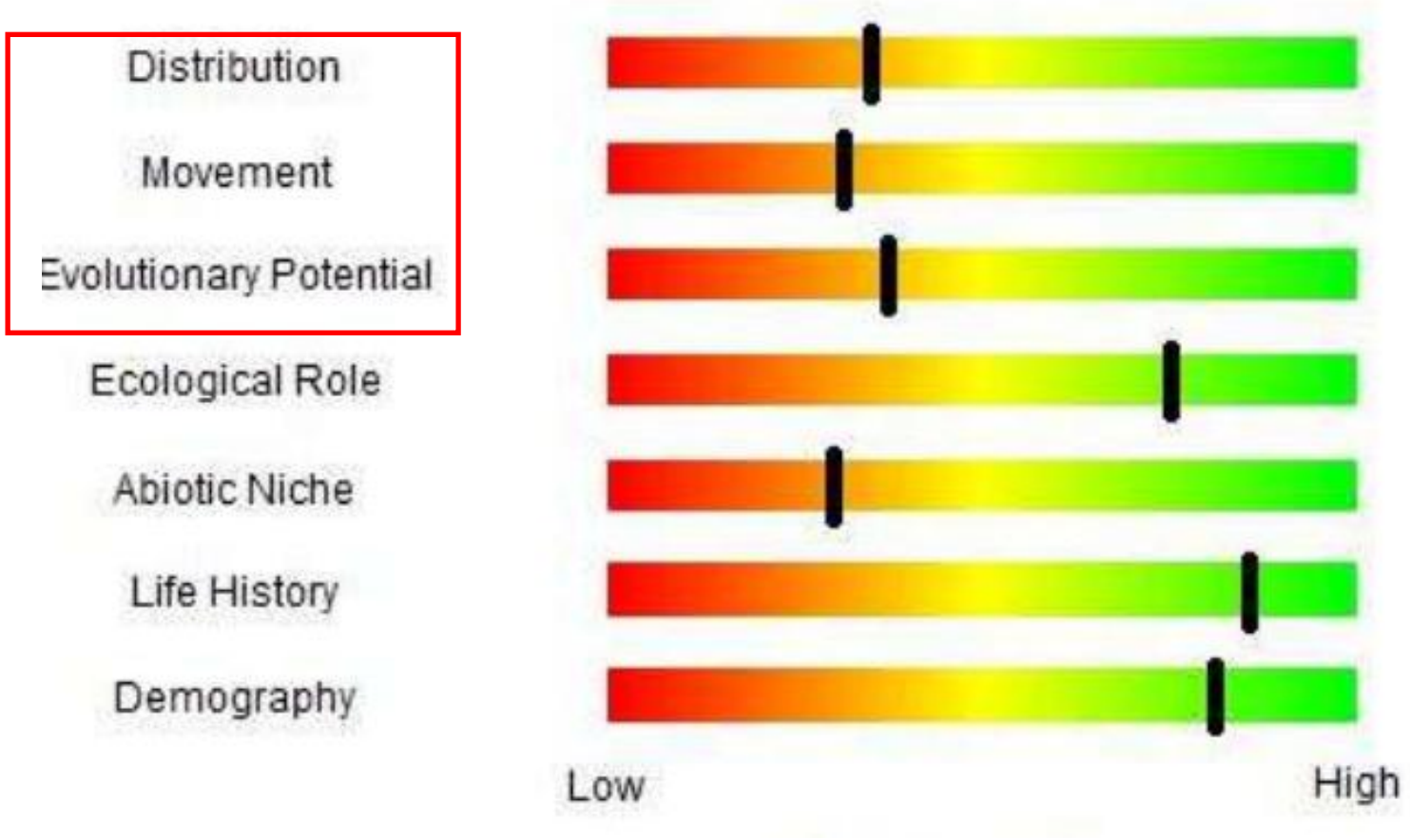



Photo credit: iNat user jwboreal

Photo credit: iNat user jwboreal

Comparison of Factors

Species	SRank	Evolutionary potential
Black-footed Ferret	S1	1
American Bison	S3	0.75
Northern Myotis	S1S2	0.666667
White-tailed Prairie Dog	S1	0.666667
Little Brown Myotis	S2S3	0.583333
Fringed Myotis	S3	0.583333
Long-legged Myotis	S3	0.583333

Upcoming Work

- Northern Myotis Acoustics
  - Determine if clutter impacts echolocation calls
  - Assess similarity between other Myotis species
  - Provide guidance for acoustic detection and vetting
- Develop workflow for storage and databasing of non-bat acoustic data



Questions?



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