THE BOTANY PROGRAM

2025 Progress Report

MONTANA STATE LIBRARY
NATURAL HERITAGE PROGRAM

Andrea Pipp
Botany Program Manager

Kenda Herman
Botany Data Assistant

Montana Field Guide

posting, replacing, & captioning botanical photographs

for at least 440 taxa

Connie Geiger, volunteer

Wolf Lichen - *Letharia vulpina*

Orchid Ipomopsis - *Ipomopsis spicata ssp. orchidacea*

Meadow Goat's-beard - *Tragopogon dubius*

Montana's Botanical Taxa

...tracking native & exotic species, their status, & distributions

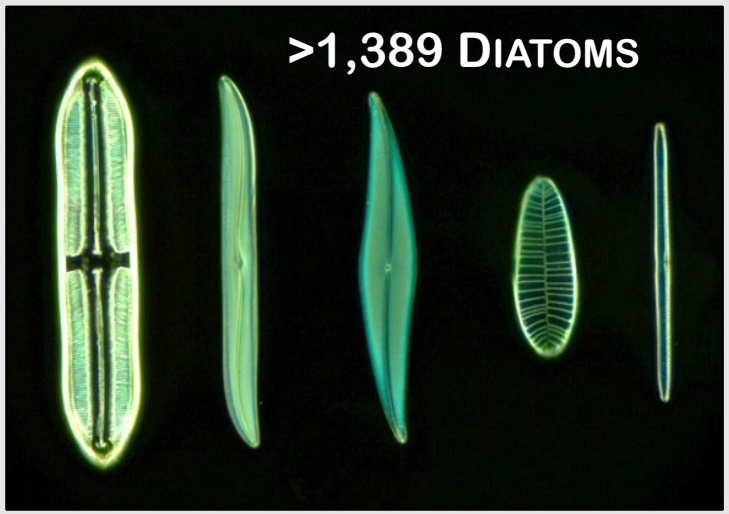
>1,659 Fungi

≈ 1,059 Lichens

≈ 132 Liverworts

≈ 2,833 Vascular Plants

>1 Hornworts



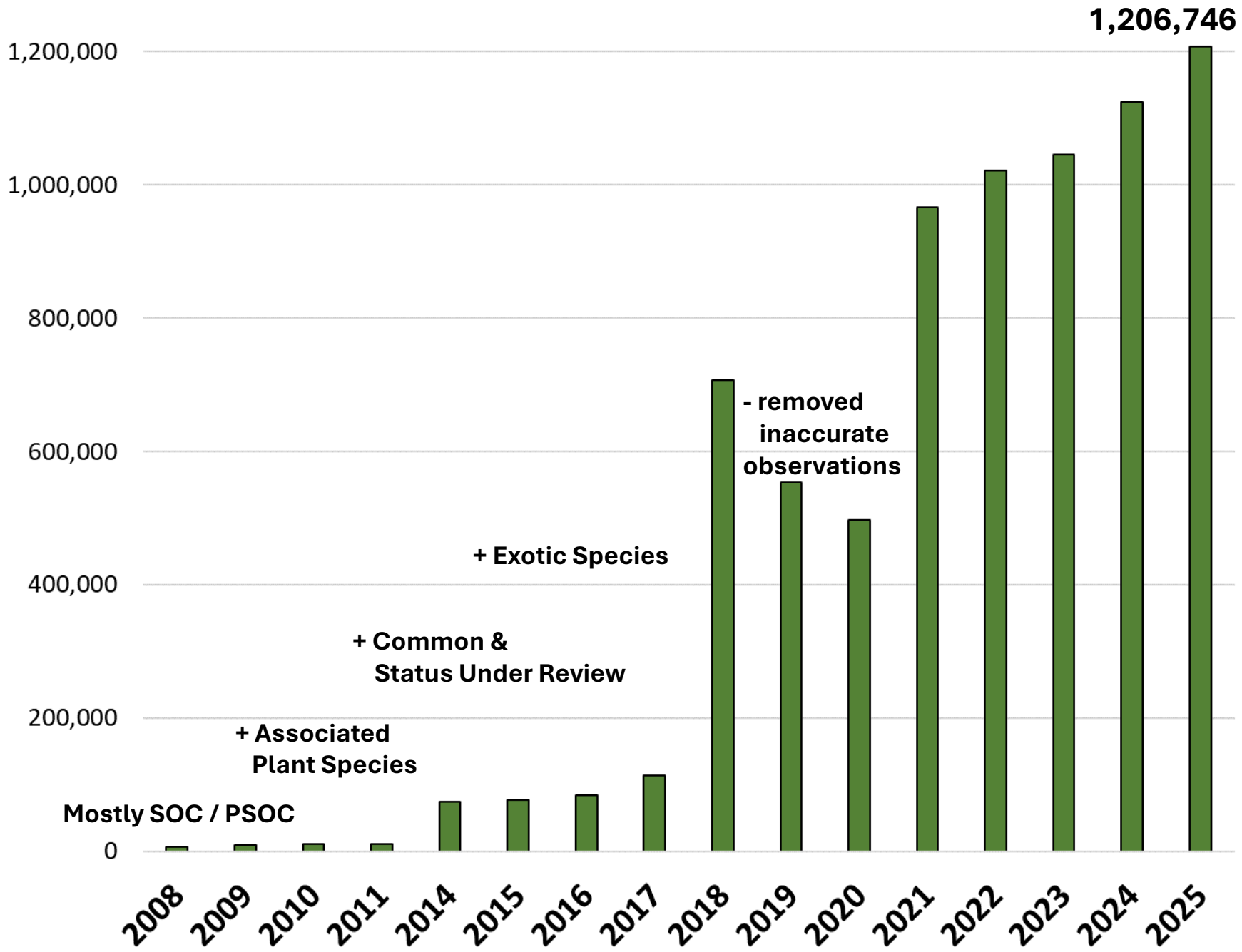
≈184 Cyanobacteria

> 828 Algae
as traditionally classified

> 521 Mosses

Number of Botanical Observations

- all taxa -



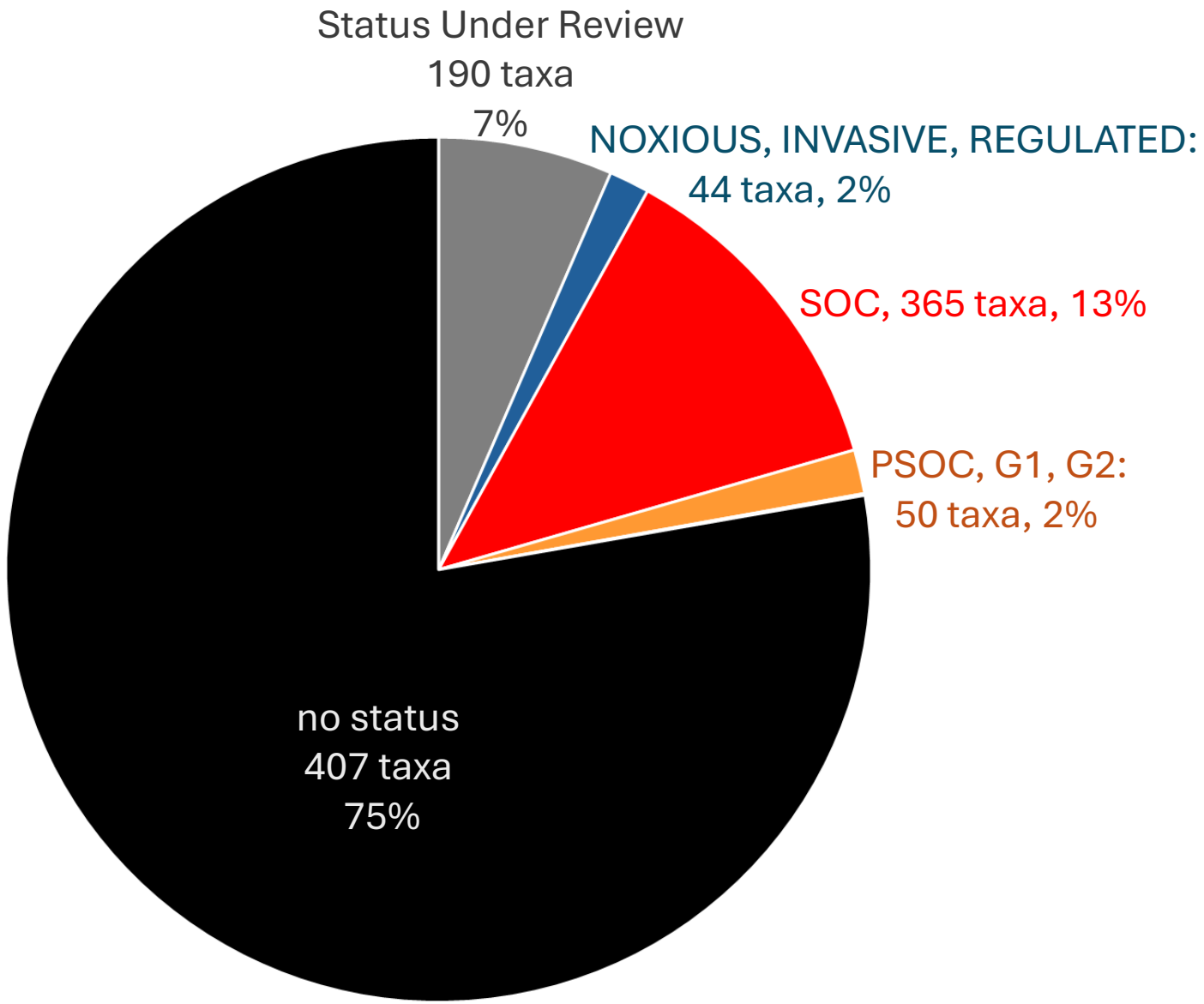
VASCULAR PLANTS

> 2,800 taxa:

- species
- varieties
- subspecies
- hybrids

> 1.1 million observations

- missing numerous herbarium records



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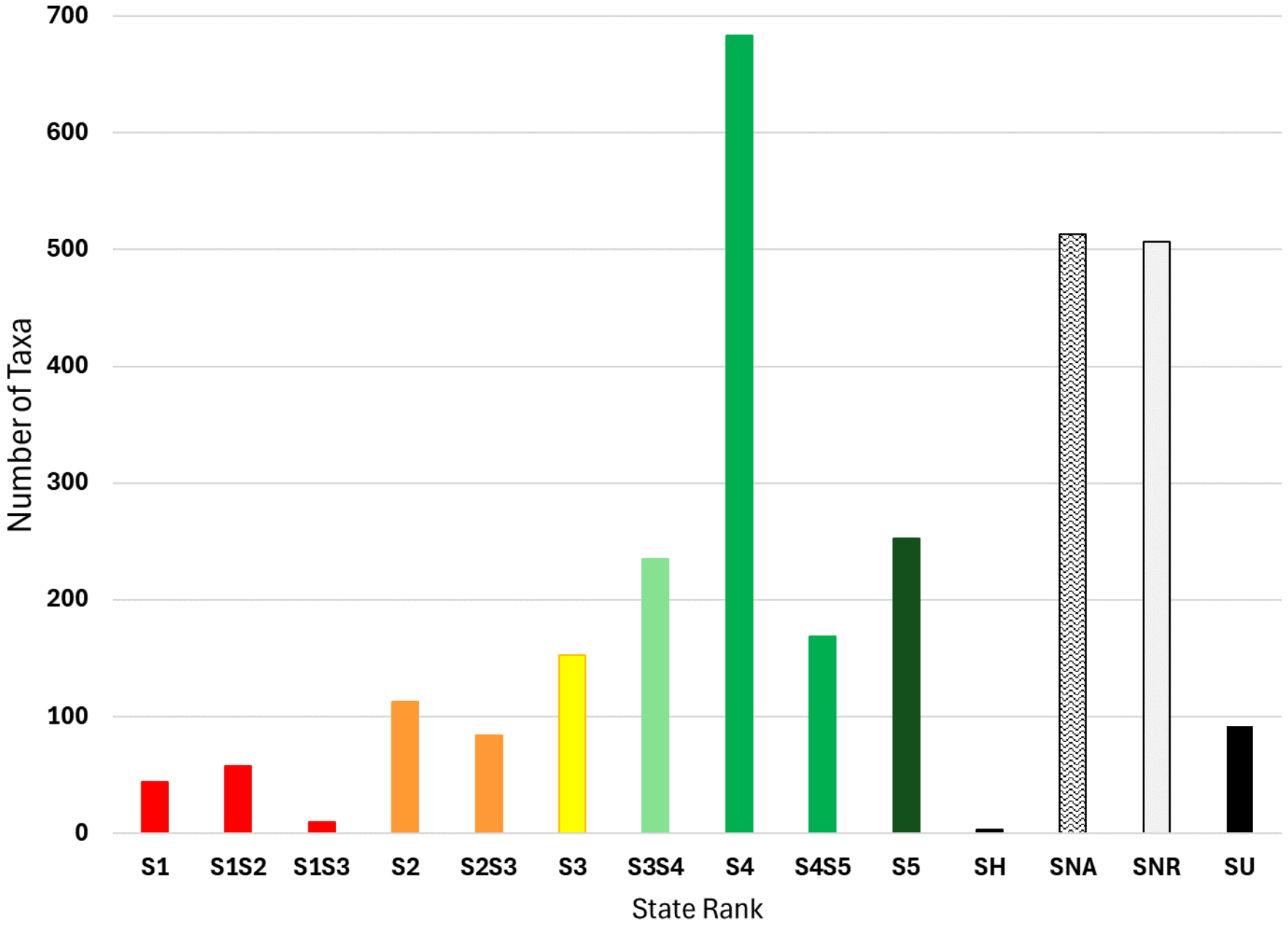

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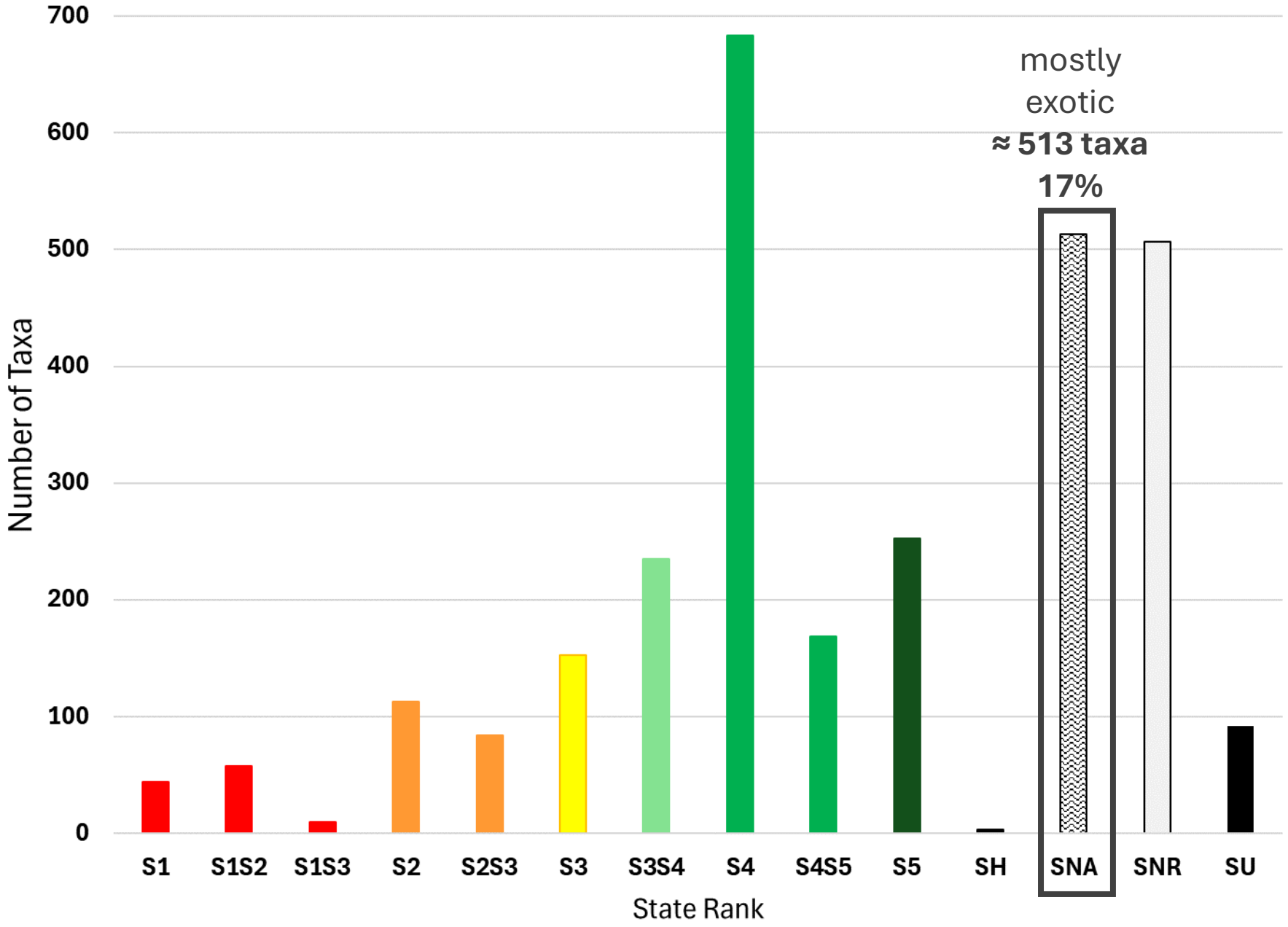

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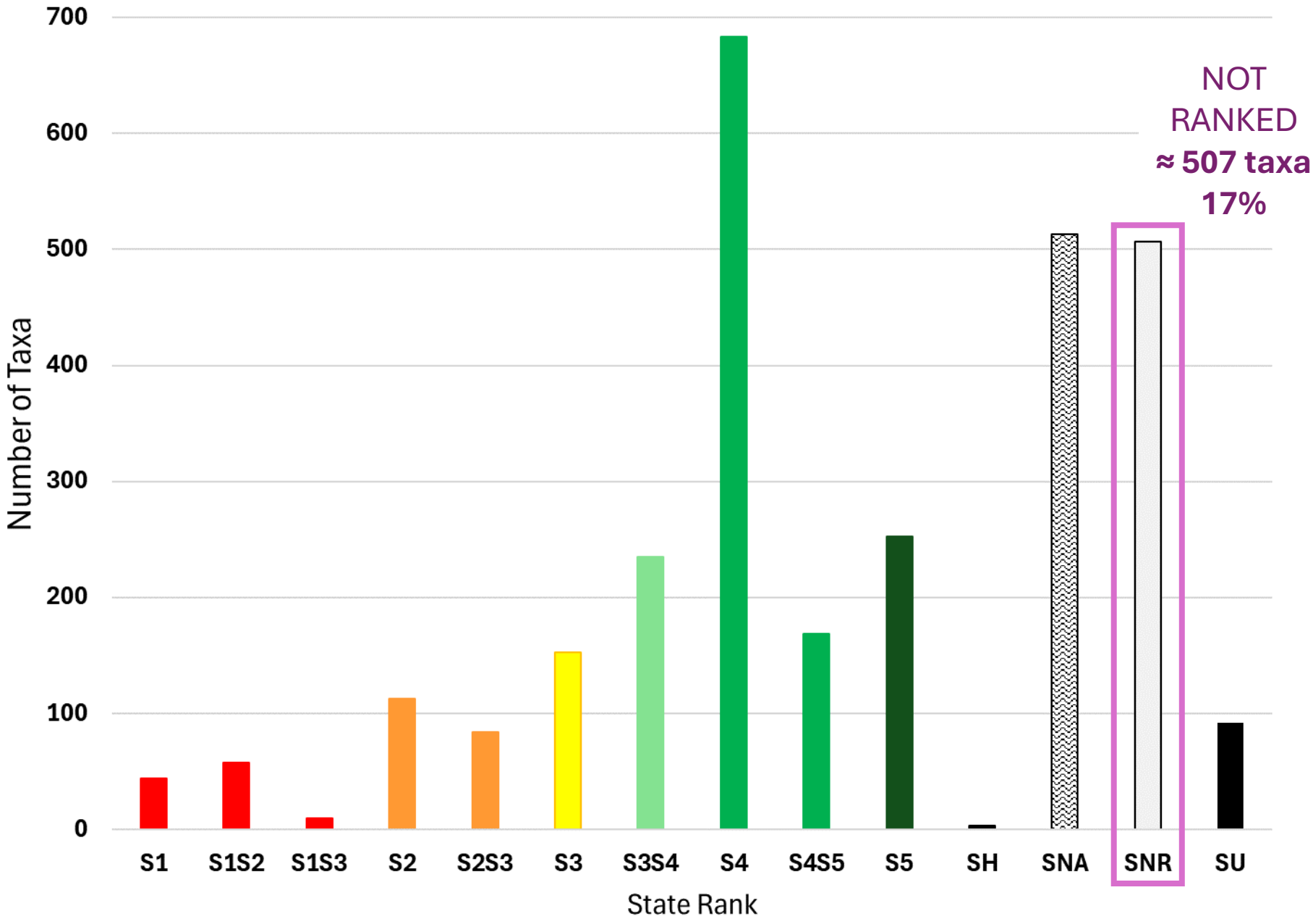

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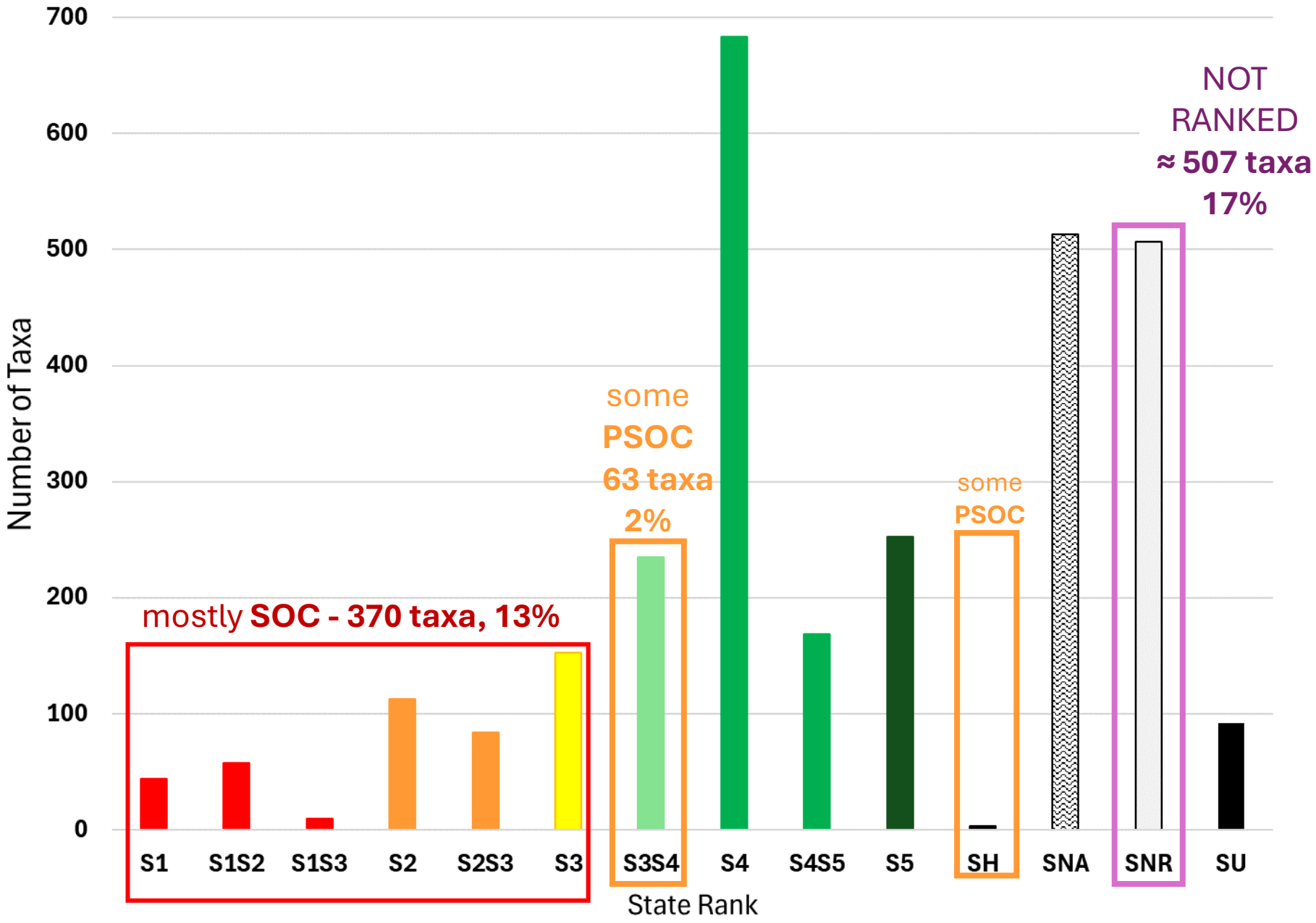
Reviewing P/SOC S-Ranks

- subset of P/SOC
- by Scott Mincemoyer, under contract



MOSSES

542 taxa:

- species
- varieties
- subspecies

540 native, 2 exotic taxa

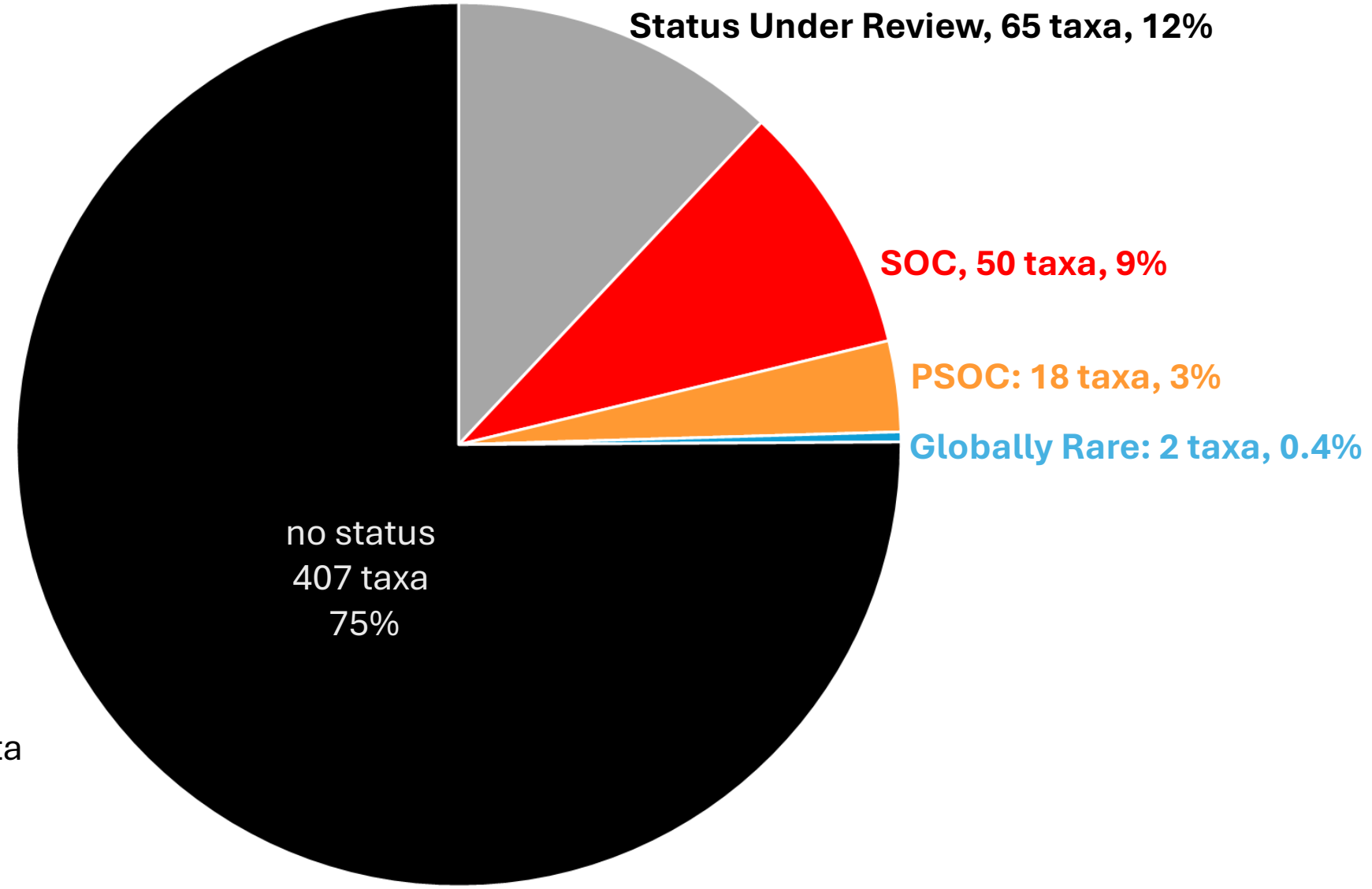
2021: updated checklist

Last SOC review: 2009

- based on expert opinion & sparse data

> 12,911 observations

- includes best, credible data
- some historical datasets on hold



MOSSES

542 taxa:

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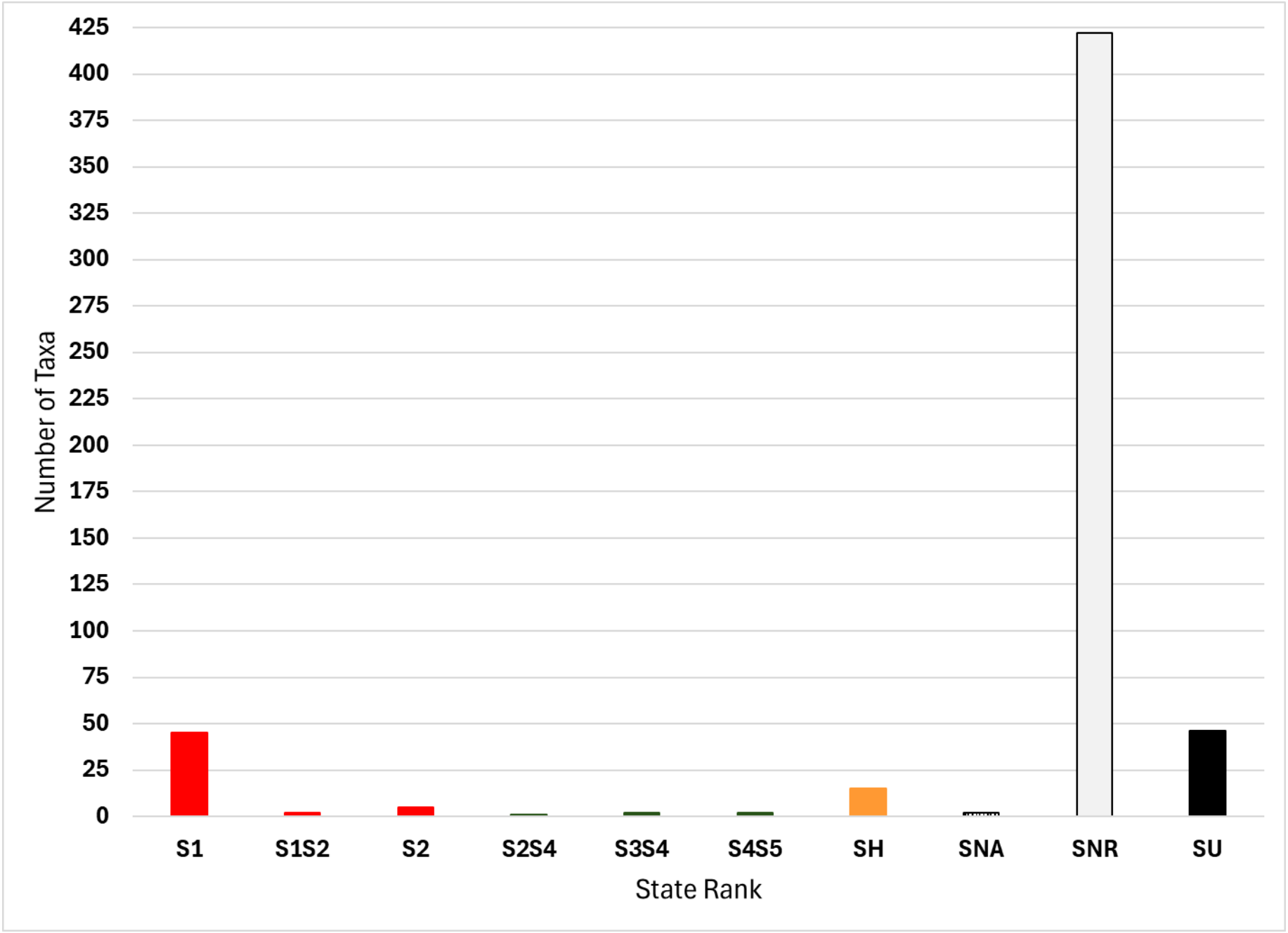
57 taxa ranked

- mostly in 2009

422 taxa not ranked



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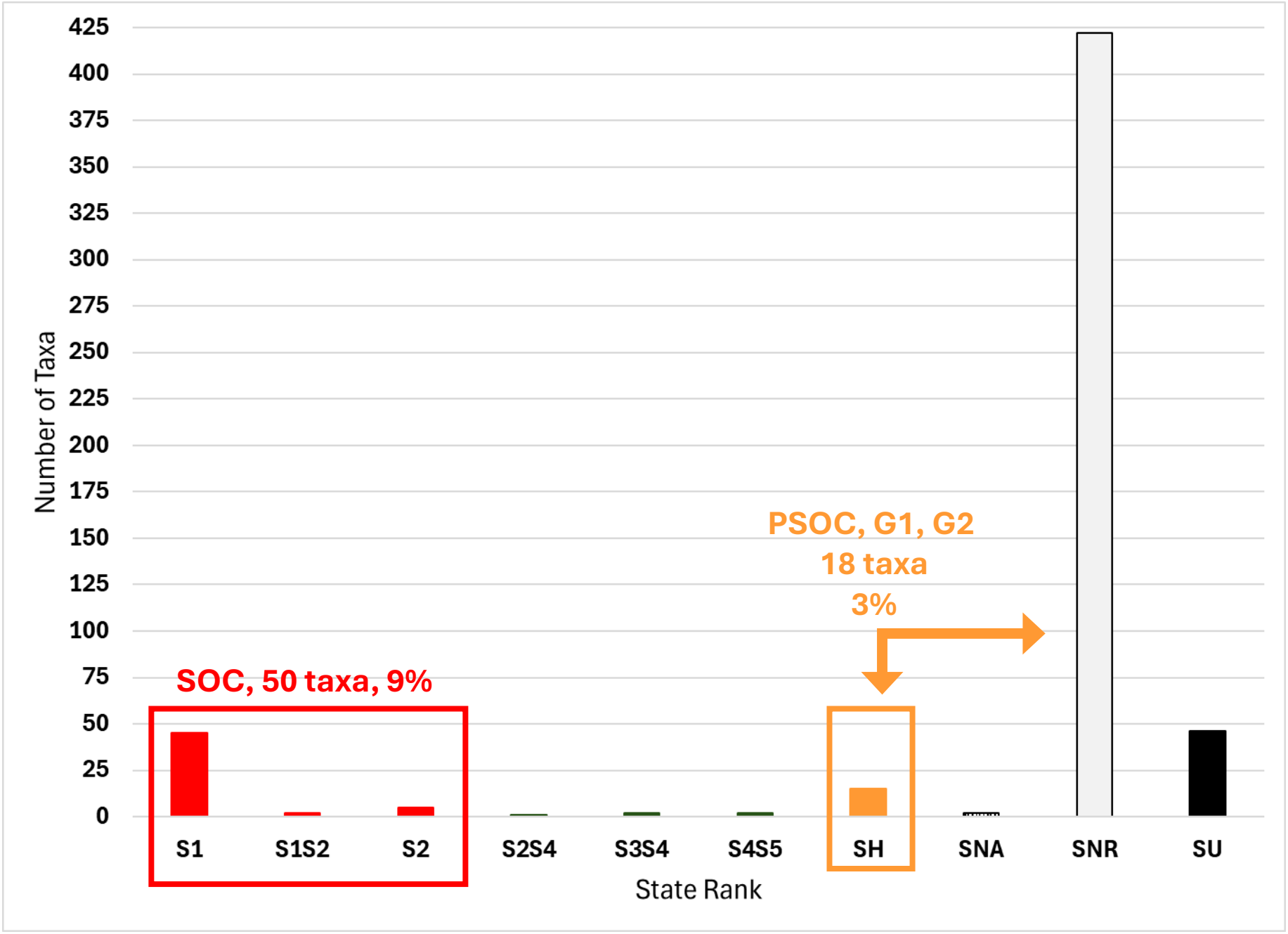

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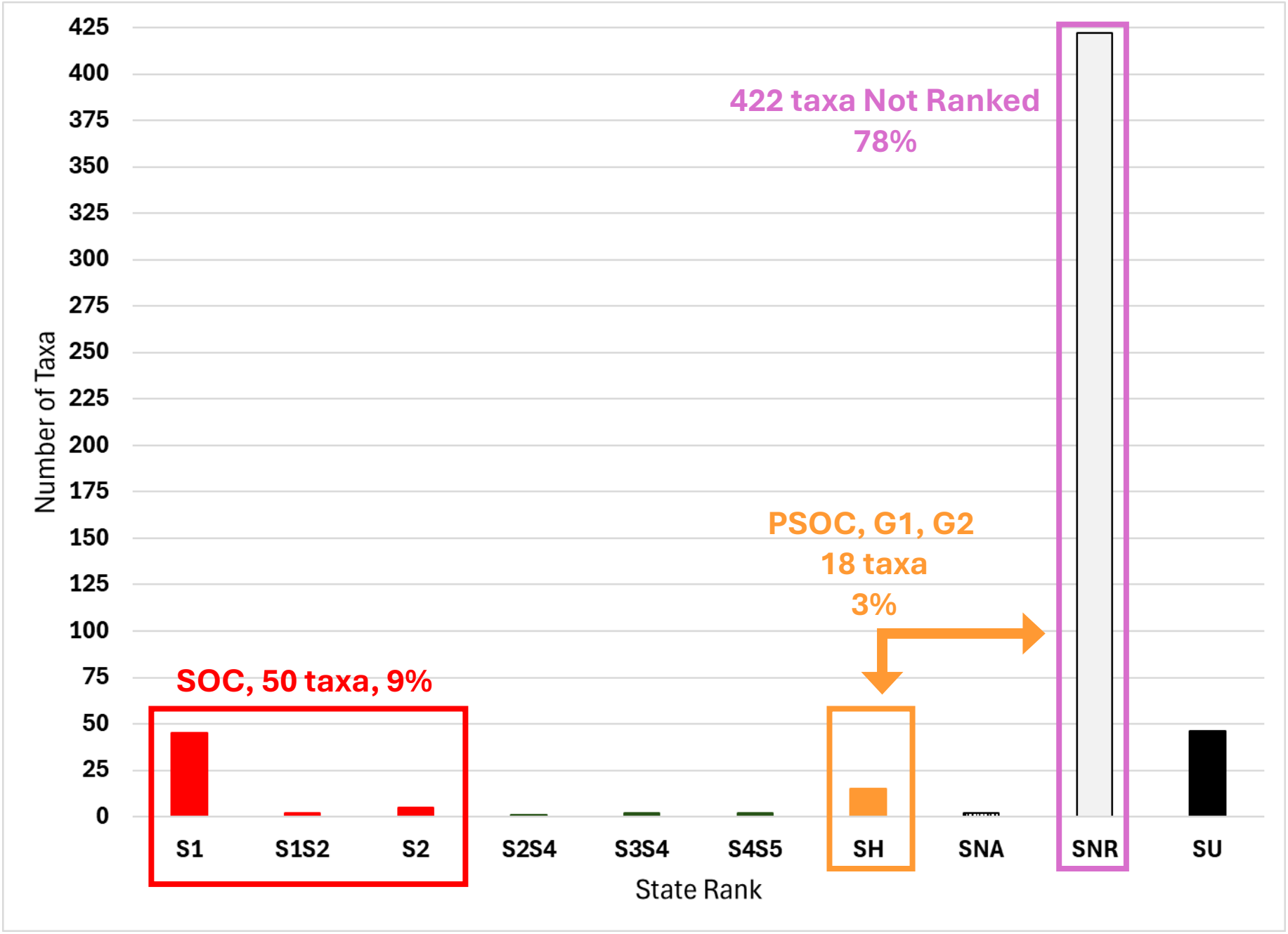


Ranking Montana's Moss Flora

2025 - 2026 GOAL

- To review 542 moss taxa to revise or create State Ranks
- 2025 Revised Ranks
  - *Abietinella abietina*
  - *Thuidium recognitum*
  - *Timmia austriaca*
  - *Timmia megapolitana*
  - *Timmia megapolitana* ssp. *bavarica*

2026 - 2027 GOAL

- To gather experts, re-evaluate , and revise Species of Concern list

Fir-tree Moss - *Abietinella abietina*

Other Names: Wiry Fern Moss, *Hypnum abietinum*, *Thuidium abietinum*

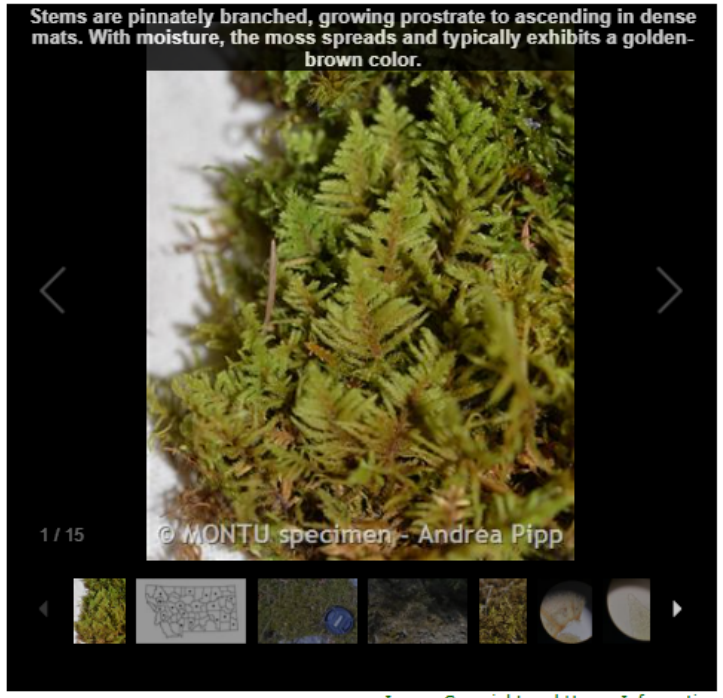


Image Copyright and Usage Information

Native Species

Global Rank: G5
State Rank: S4S5
(see **State Rank Reason** below)

Agency Status
USFWS:
USFS:
BLM:

iNaturalist Submit MT Observations

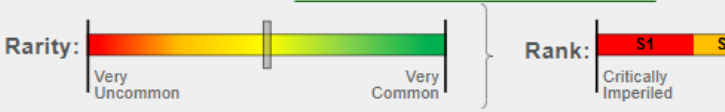
External Links

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

State Rank Reason (see State Rank above)

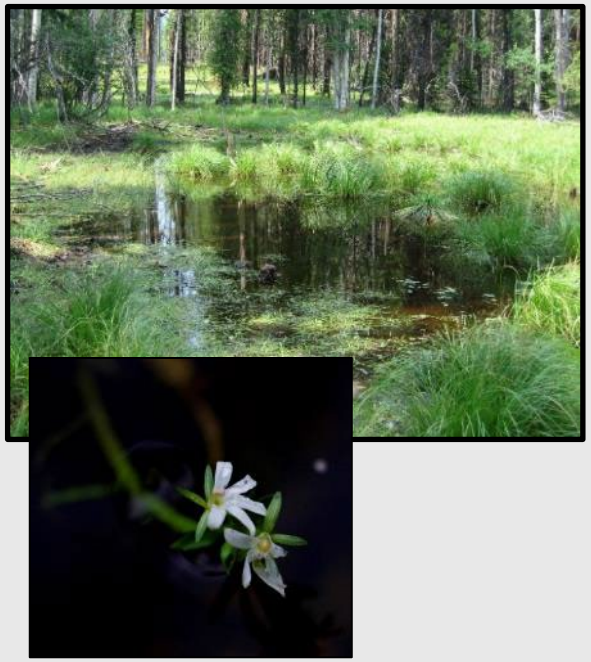
Abietinella abietina is an easily recognized moss that is widespread throughout the northern USA and Canada (Buck *in* Flora of North America 2014). *Abietinella abietina* is also widespread in Montana where the moss often grows in extensive mats within commonly found habitats. As of 2025, population trends and threats have not been identified. In Montana, *Abietinella abietina* is possibly more secure than observation records, and the calculated State Rank might indicate. Therefore, a Conservation Status Rank of S4S5 is assigned as of 2025. Verified observations from revisits and new locations that bring forth information on population sizes, habitat conditions, threats, and trends is needed to substantiate the conservation status rank in Montana.

Fir-tree Moss (*Abietinella abietina*) Conservation Status Summary
State Rank: S4S5
Review Date = 11/28/2025
How we calculate Conservation Status



See the complete Conservation Status Report

Plants & Endangered Species Act



Howellia aquatilis
Water Howellia
2021 DE-LISTED

Silene spaldingii
Spalding's Catchfly
THREATENED

Spiranthes diluvialis
Ute Ladies'-tresses
THREATENED

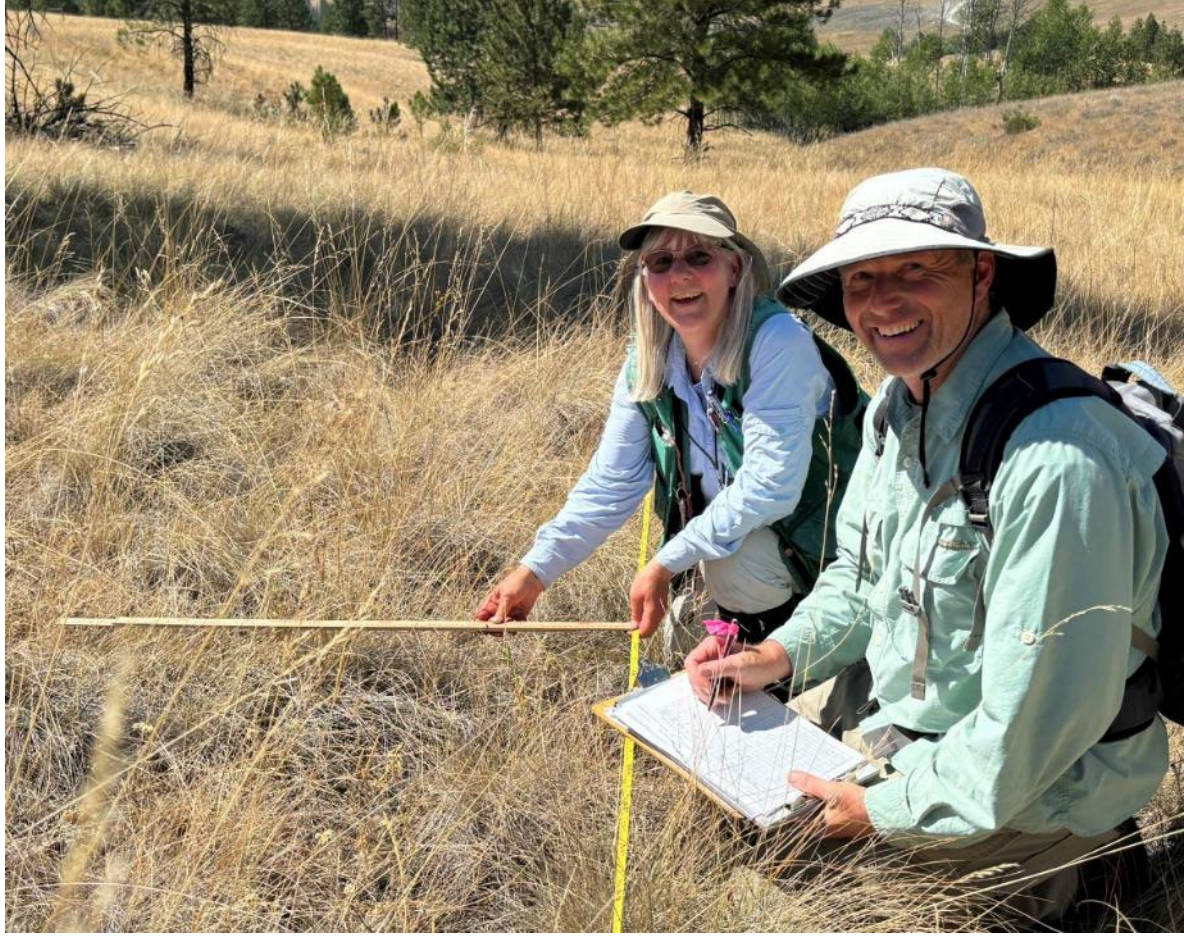
Pinus albicaulis
Whitebark Pine
THREATENED

Physaria pachyphylla
Thick-leaf Bladderpod
PETITIONED

SPALDING'S CATCHFLY
SILENE SPALDINGII

- ESA-listed Threatened
- 2007 Recovery Plan:

Determine the population trend over a 20+ year period at Key Conservation Areas (KCAs) across range



2026-2028

- 3-year project awarded & approved
- Implement Monitoring Round 2 at Crosson Valley & Sullivan Hill KCAs, Flathead Indian Reservation

FUNDING

USFWS - Section 6 Grant

Field and Project Support

Confederated Salish & Kootenai Tribes

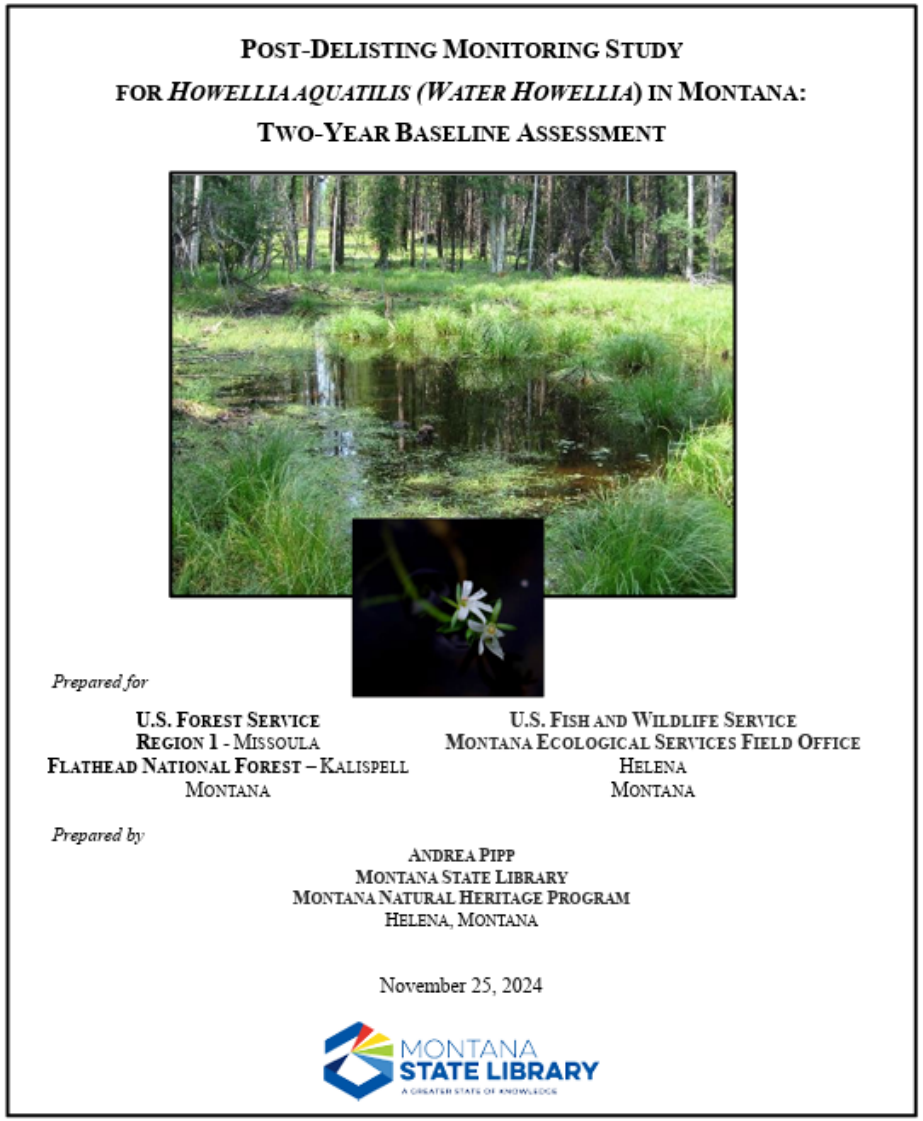
POST-DELISTING MONITORING
FOR
WATER HOWELLIA (*HOWELLIA AQUATILIS*)

- Delisted from Endangered Species Act (ESA) – June 16, 2021
- Triggers ESA Section 4(g)(1) = Post-Delisting Monitoring Plan
- Monitoring Period: 2022 - 2036
- Completed 1st Monitoring Interval: 2022-2023
  by USFS, USFWS, & MTNHP
- Monitoring Round 2: 2028 - 2029

Funding: USFWS – Section 6 Grant

FIND IT!

mtnhp.mt.gov/resources/reports/Botany



POST-DELISTING MONITORING STUDY
FOR *HOWELLIA AQUATILIS (WATER HOWELLIA)* IN MONTANA:
TWO-YEAR BASELINE ASSESSMENT

Prepared for

U.S. FOREST SERVICE
REGION 1 - MISSOULA
FLATHEAD NATIONAL FOREST – KALISPELL
MONTANA

U.S. FISH AND WILDLIFE SERVICE
MONTANA ECOLOGICAL SERVICES FIELD OFFICE
HELENA
MONTANA

Prepared by

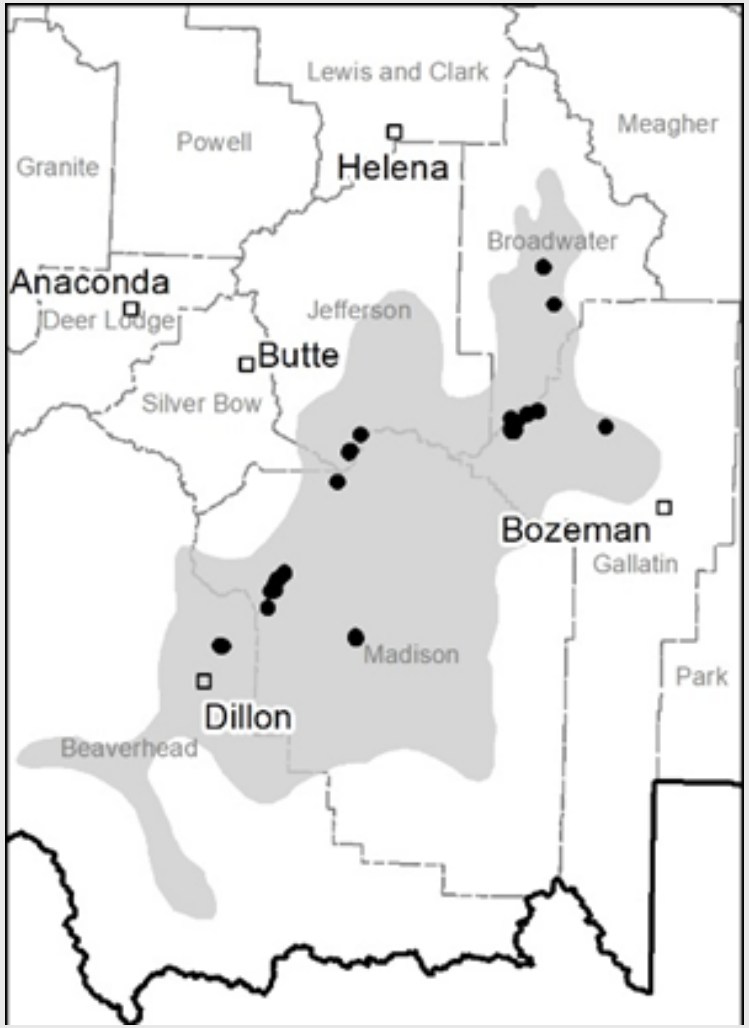
ANDREA PIPP
MONTANA STATE LIBRARY
MONTANA NATURAL HERITAGE PROGRAM
HELENA, MONTANA

November 25, 2024

MONTANA STATE LIBRARY

- National Status: ESA Listed - Threatened
- USFWS:
  - Draft Post-Delisting Monitoring Plan: 2024
  - Proposed to Delist: January 7, 2025
- <u>Montana Status</u>???
  - Mostly small populations
  - On state & private lands
  - 29 known occurrences
  - 1 extirpated
  - 1 facing likely-adverse effects
  - 21 occurrences last visited 12 to 20+ years ago

  + MDT manages and monitors to promote viable populations
- Looking for opportunities to:
  - Engage with public
  - Conduct revisits
  - Disseminate brochure
  - Work with private landowners

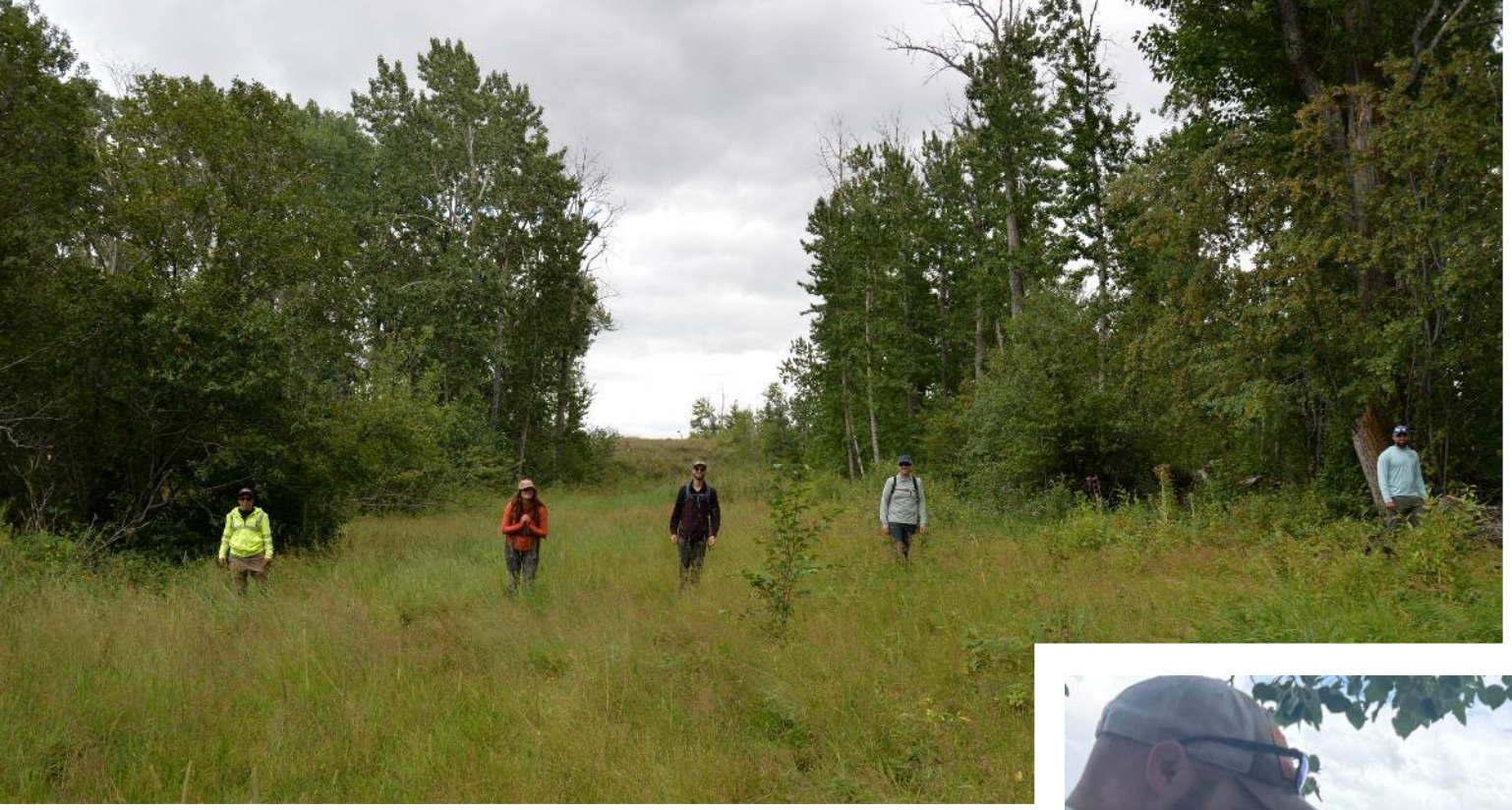


Ute Ladies'-tresses - Field Training

- Taught by Larry Urban, MDT Wetland Mitigation Specialist

- Participants: 6 federal & state agencies,
  Northwestern Energy,
  3 consulting firms

- Plant Identification
- Grazing & Land Management
- MDT monitoring protocol



UTE LADIES'-TRESSES (ULT)

- Proposed pipeline route on lands modelled as Predicted Suitable Habitat
- No ULT plants found
- Habitat determined as not suitable for ULT
- Field data informs model & energy project
- 2026 surveys planned for other portions of pipeline route

Thick-leaf Bladderpod

Physaria pachyphylla

Species-level Recognition: 1998 (Grady & O'Kane 2007)

Regional Endemic: Pryor Mountain Desert, MT
& northern Big Horn Basin, WY

Threats: Gypsum Mining, Off-Road Vehicles, Non-native Plants;
Pryor Foothill RNA/ACEC needs Congressional approval

Petitioned for ESA-Listing: 2021

Physaria pachyphylla (Thick-leaf Bladderpod) in Montana and Wyoming:
Field Surveys and Status Assessment, 1983 to 2024

Prepared For

USDI Bureau of Land Management
Wyoming & Montana/Dakotas State Offices

Prepared By

Montana Natural Heritage Program & Wyoming Natural Diversity Database

Agreement No. L22AC00227

January 27, 2025; revised April 14 , 2025

Physaria Pachyphylla (Thick-leaf Bladderpod)
in Montana And Wyoming:
Field Surveys and Status Assessment, 1983 To 2024

finalized April 2025

Find It!
MTNHP website / Resources / Reports

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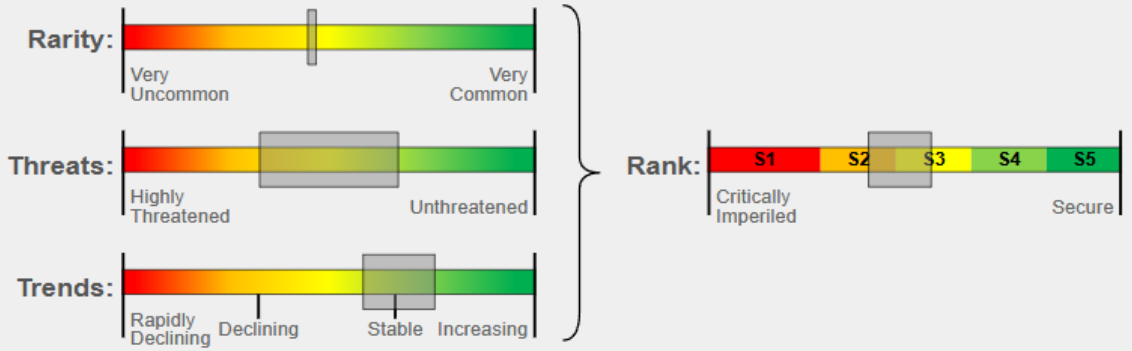
Thick-leaf Bladderpod

Physaria pachyphylla

State Rank Reason (see State Rank above)

Physaria pachyphylla is a local endemic of the Pryor Mountain foothills and desert that crosses the Montana – Wyoming state boundary (Pipp, Heidel, and Herman 2025). *Physaria pachyphylla* was formally recognized as a 'new' species in 2007. Plants occupy a restricted habitat composed of dry, sparsely vegetated, and stony soil, derived from limestone and/or diatomaceous earth (Grady and O'Kane 2007). Where habitat is appropriate, plants may be abundant. Where *Physaria pachyphylla* and *P. spatulata* overlap, a few individuals of intermediate morphology have been found, suggesting that there is possible introgression between the species. *Physaria pachyphylla* populations are at-risk to loss from the introduction of non-native plants (*Bromus tectorum* and *Malcolmia africana*), ground disturbing activities from potential gypsum mining and related mining activities, and off-road vehicle use. A 2025 review of *Physaria pachyphylla* retains an S2S3 rank in Montana. Monitoring data that assesses population trends in places with and without recognized or potential threats is needed.

Thick-leaf Bladderpod (*Physaria pachyphylla*) Conservation Status Summary
State Rank: S2S3
Review Date = 06/12/2025
How we calculate Conservation Status



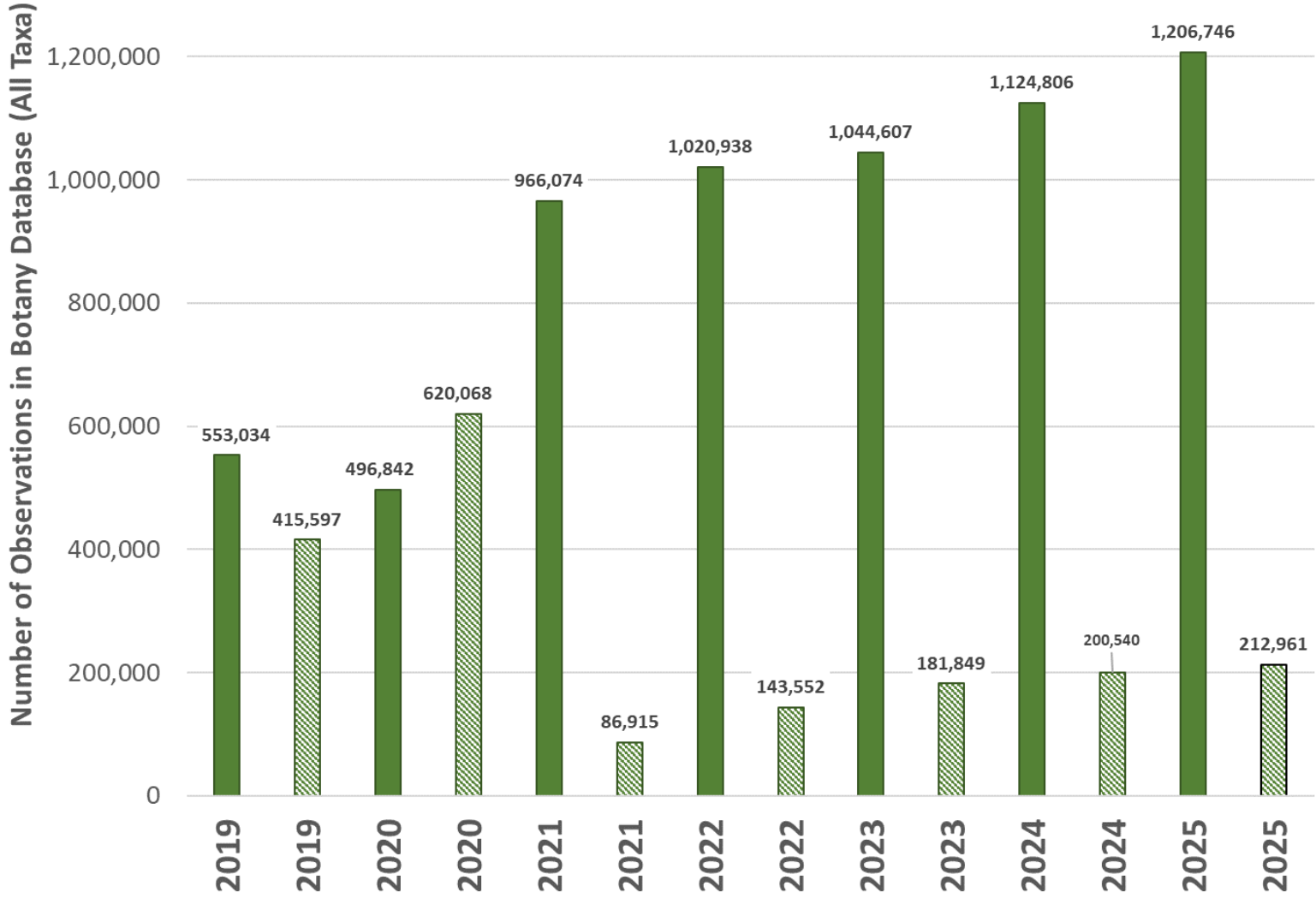
See the complete Conservation Status Report

FIND IT! Montana Field guide
https://fieldguide.mt.gov/

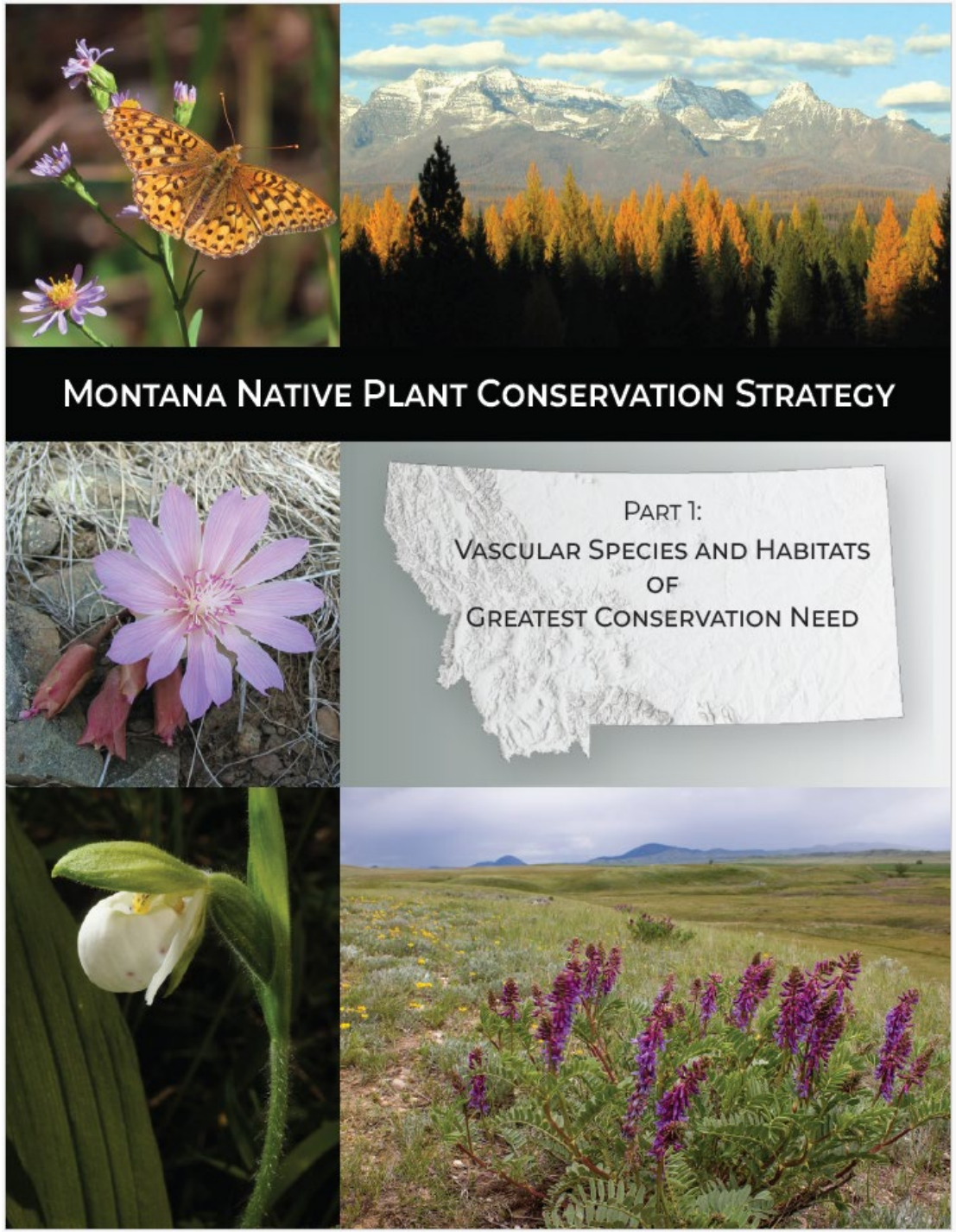
Reviewing Provisional Botany Observation Data

prioritizing NON-Native Plants

- **Conduct quality control**
  - to extent possible
- **Remove 'Questionable Value' OBS**
  - -imprecise & not useful
    - better data available
  - -mis-identified
  - -coded incorrectly
  - -mapping is spatially problematic
  - -duplicated data
  - -problematic & not trust-worthy
- **2025: > 50,000 observations reviewed** for acceptance or removal



Funded: Montana Department of Agriculture - Noxious Weed Trust Fund



2025 ACCOMPLISHMENTS

Strategy Stewards Committee - January 2025

- USFS Regional Botanist – Amanda Hendrix
- MT/Dakotas BLM State Botanist – Wendy Velman
- MT DNRC – Tim Spoelma
- Tribal Nation / Ethno-Botanist: [Dennis Longknife]
- MFWP Plant Ecologist: Jarrett Payne
- MNPS Conservation Chair – [Elizabeth Bergstrom]
- MTNHP Botanist & Ecologist – Andrea Pipp

Publicizing Strategy

- MNPS Presents! series - YouTube
- Montana Library Network
- *Kelseya* newsletter

Montana SWAP - 2025 revision

- Assisted MFWP with writing & editing
- Includes 109 Plant Species of Greatest Conservation Need!

Find It!

MTNHP website / Botany / Native Plant Conservation Strategy

Lichen Biomonitoring in Montana

Using lichens to monitor trends in air quality and climate

Funded By: US Forest Service - Region 6 & MTNHP

LICHEN BIOMONITORING
Training Certification

10 participants

- Bitterroot NF
- Beaverhead NF
- MTNHP

Funding: USFS-Region 6 & MTNHP

Lichen Biomonitoring in Montana

2026 Goals

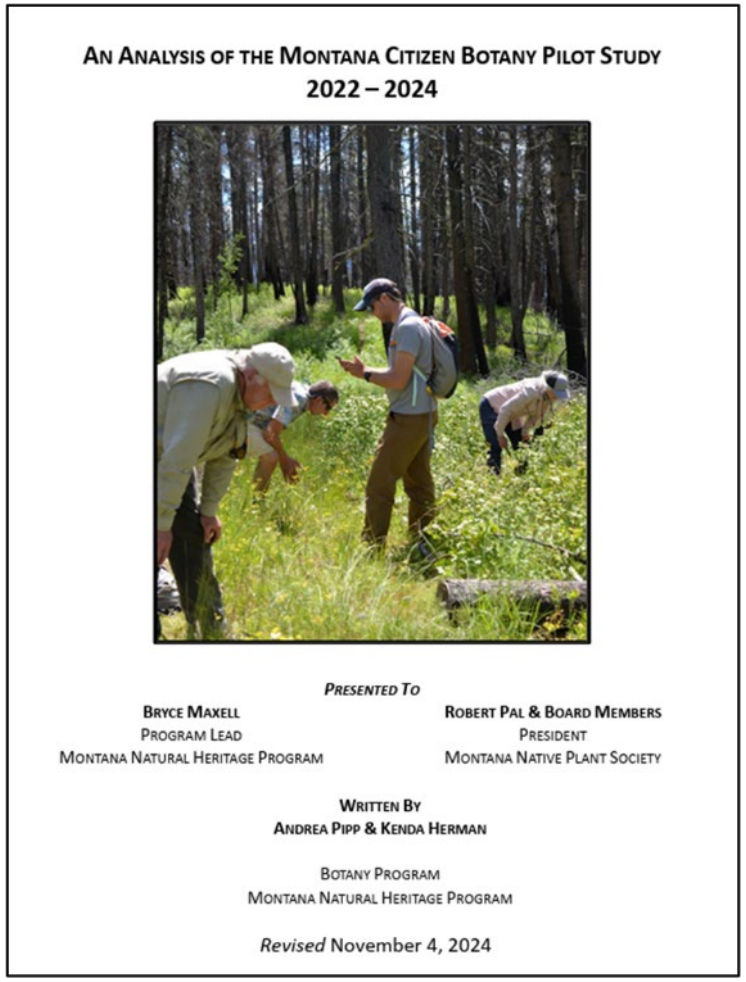
- Continue in the role of Lichen Specialist for Montana, and help expand the monitoring
- With staff time and funding:
  - Conduct spring refresher to certified lichen collectors
  - Have Kenda independently monitor 1-2 plots
  - Offer to teach a certification workshop to permanent and long-term staff on other National Forests.

Montana Citizen Botany Program

jointly managed by MTNHP & Montana Native Plant Society

Pilot Study: 2022-2024

successful - not yet sustainable



An Analysis of the Montana Citizen Botany Pilot Study
2022 – 2024

Phase 3 Objectives: 2025 to 2029

- Establish a Citizen Botany Coordinator that is separate from the MTNHP Botanist
- Explore how Citizen Botanists can help gather data on native plant seed sources or collect seed
- Continue revisits to known rare plant occurrences:
  - presence/absence
  - population size
  - habitat condition
  - threats
- Host group-based revisits and seed collecting activities
- Investigate financial planning

Funded By:
MNPS, Montana Department of Agriculture, Montana/Dakotas BLM, USFS-Region 1

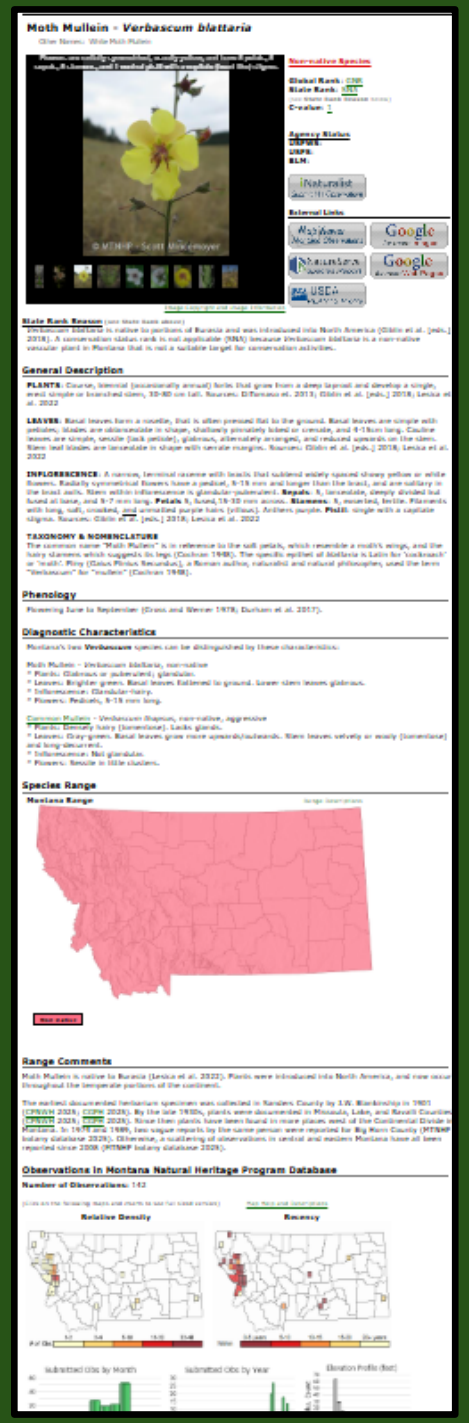
Montana Citizen Botany Program

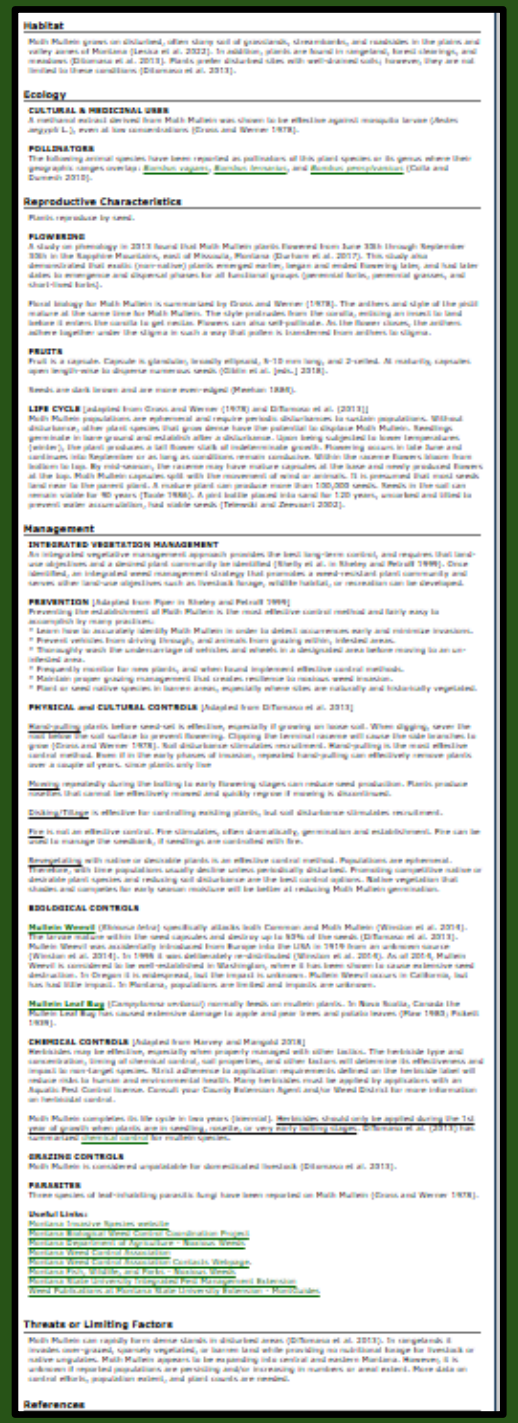
jointly managed by MTNHP & Montana Native Plant Society

Phase 3 Objectives: 2025 to 2029

Citizen Botany Coordinator

- Montana AgCorps - AmeriCorps member
- Serving 11-month position: January - November 2026



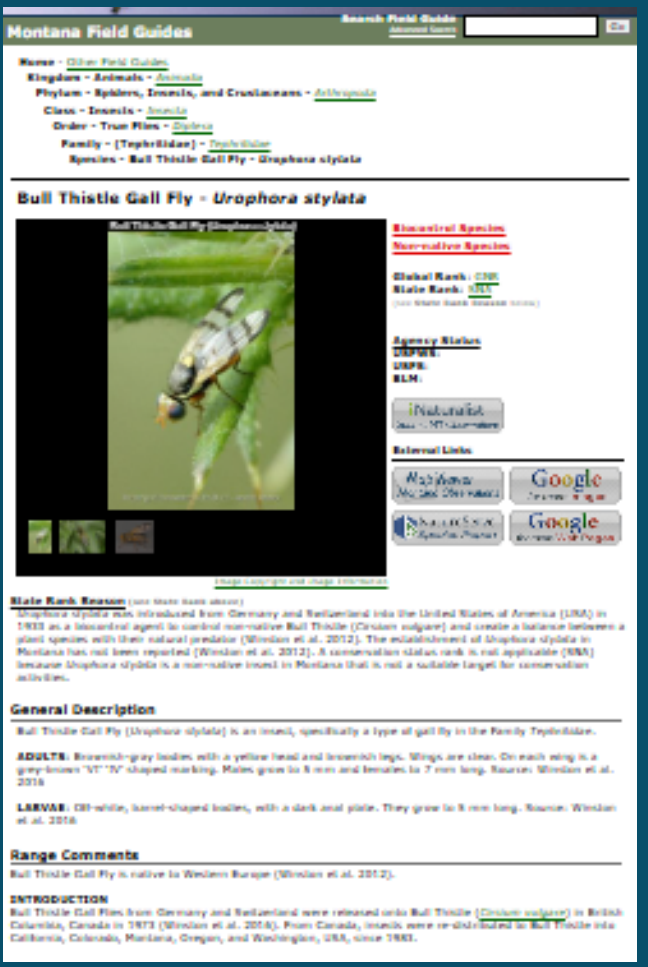


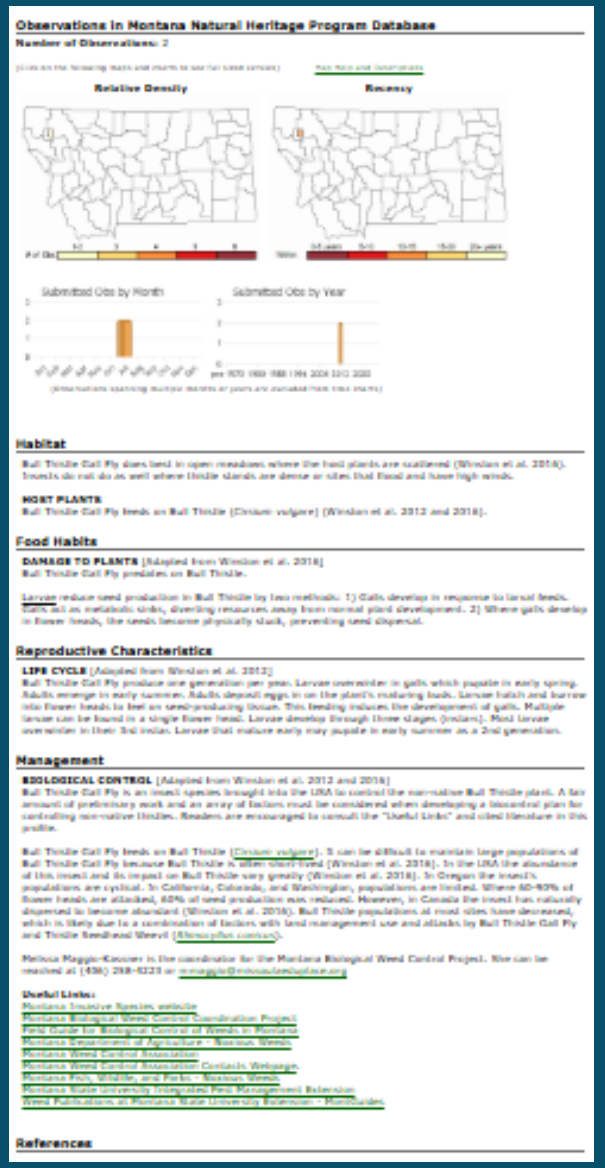
Montana Field Guide

2025 Profiles updated!

- *Carduus cinereus* - exotic, NOT documented
- *Carduus nutans* - exotic
- *Carduus acanthoides* - exotic
- *Cirsium arvense - exotic*
- *Cirsium vulgare* - exotic
- *Phragmites australis*
  - ssp. *australis - exotic*
  - ssp. *americanus* - native
- *Ventenata dubia* - noxious
- *Verbascum blattaria* - exotic
- *Verbascum thapsus* - exotic

Funding By: US Forest Service, Region 1





Montana Field Guide

2025 Biological Control Agent Profiles created!

non-native Thistles

- *Cheilosia corydon*
- *Rhinocyllus conicus*
- *Trichosirocalus horridus*
- *Urophora stylata*
- *Urophora cardui*
- *Urophora solstitialis*

insects

- *Puccinia punctiformis* —— *fungus*

Funding By: *MTNHP*
US Forest Service, Region 1

MONTANA FIELD GUIDE

LINKING NOXIOUS WEEDS & BIOCONTROL AGENTS

Canada Thistle - *Cirsium arvense*

Other Names: Creeping Thistle, California Thistle

Image Copyright and Usage Information

Noxious Weed: Priority 2B

Non-native Species

Global Rank: G5
State Rank: SNA
(see **State Rank Reason** below)
C-value: 0

Agency Status
USFWS:
USFS:
BLM:

iNaturalist Submit MT Observations

External Links

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

State Rank Reason (see State Rank above)

Cirsium arvense is a plant native to southeastern Europe and eastern portions of the Mediterranean area and has been introduced in North America (Morishita *in* Sheley and Petroff 1999). A conservation status rank is not applicable (SNA) because the plant is an exotic (non-native) in Montana that is not a suitable target for conservation activities.

BIOLOGICAL CONTROLS [Adapted from Jacobs et al. 2007; Winston et al. 2012; Field Guide for Biological Control of Weeds in Montana]
A variety of biocontrol agents (insects, fungi, and others) have been brought into North American to control non-native thistle plants. A fair amount of preliminary work and an array of factors must be considered when developing a biocontrol plan for controlling thistles. Readers are encouraged to consult the "Useful Links" and cited literature in this profile.

Canada Thistle Rust (*Puccinia punctiformis*) was introduced accidentally and is not formally approved for re-distribution. Canada Thistle Rust attack Canada Thistle plants and is in Montana; however, data on establishment and impacts are not fully known. The rust produces spores on leaves which germinate and the fungus travels down the stem to infect the roots. The rust weakens plants in part because infected roots cannot absorb nutrients.

Canada Thistle Stem Weevil (*Hadroplontus litura*) is a stem-boring weevil that attacks Canada Thistle rosettes. Adults lay a few eggs into a cavity (1-2.5 mm wide) on the underside of leaves that are at least 5 cm long over a 4 to 5 week period. Larvae emerge and mine down the leaf's mid-veins into the root crown and sometimes the upper root to feed on callus tissues. Older larvae mine the stem and then emerge to pupate, impacting root reserves for overwintering (https://integratedweedcontrol.com). Canada Thistle Stem Weevil will cause the most damage if it attacks the stem before it grows. Larvae pupate in cocoons of soil particles and the adults emerge in late summer to early fall to feed on the upper leaves and stems. They over-winter in soil litter, and in the spring will emerge to eat rosette leaves by puncturing them. While this will not usually kill the plant, the holes left in the root crown makes the plant susceptible to a fatal rust fungus.

Thistle Seed Head Weevil (*Rhinocyllus conicus*) is the most widely distributed insect for thistle control in the U.S.; however, the U.S. Department of Agriculture prohibits moving these weevils between states because it can feed on native thistles. It has been shown to reduce 90-95% of thistles over an 8 to 9 year period.

Leaf Beetle (*Altica carduorum*) adults feed on all *Cirsium* species; although, it is predicted that it will favor Canada Thistle.

Canada Thistle Stem Gall Fly (*Urophora cardui*) adults lay eggs into stem tissue (https://integratedweedcontrol.com). The developing larvae then cause the plant's formation of a hard woody gall, which takes energy from the plant. Stems, buds, foliage, and flowers above the galls are often malformed or stunted and prone to dry up ahead of unattacked stems, thereby, not contributing energy to root reserves.

Thistle Seedhead Weevil - *Rhinocyllus conicus*

Image Copyright and Usage Information

Biocontrol Species

Non-native Species

Global Rank: GNR
State Rank: SNA
(see **State Rank Reason** below)

Agency Status
USFWS:
USFS:
BLM:

iNaturalist Submit MT Observations

External Links

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

State Rank Reason (see State Rank above)

Rhinocyllus conicus was introduced from France and Italy into Canada and the United States of America (USA) as a biocontrol agent to control non-native thistles and create the balance of a plant species with their natural predator (Winston et al. 2012 and 2016). The insect naturally spread and became established. Although *Rhinocyllus conicus* is abundantly found on Musk Thistle and other non-native thistles, it has also been documented on 22 of the 90 native thistle species in the USA. Therefore, *Rhinocyllus conicus* is no longer approved for re-distribution in the USA. A conservation status rank is not applicable (SNA) because *Rhinocyllus conicus* is a non-native insect in Montana that is not a suitable target for conservation activities.

Range Comments

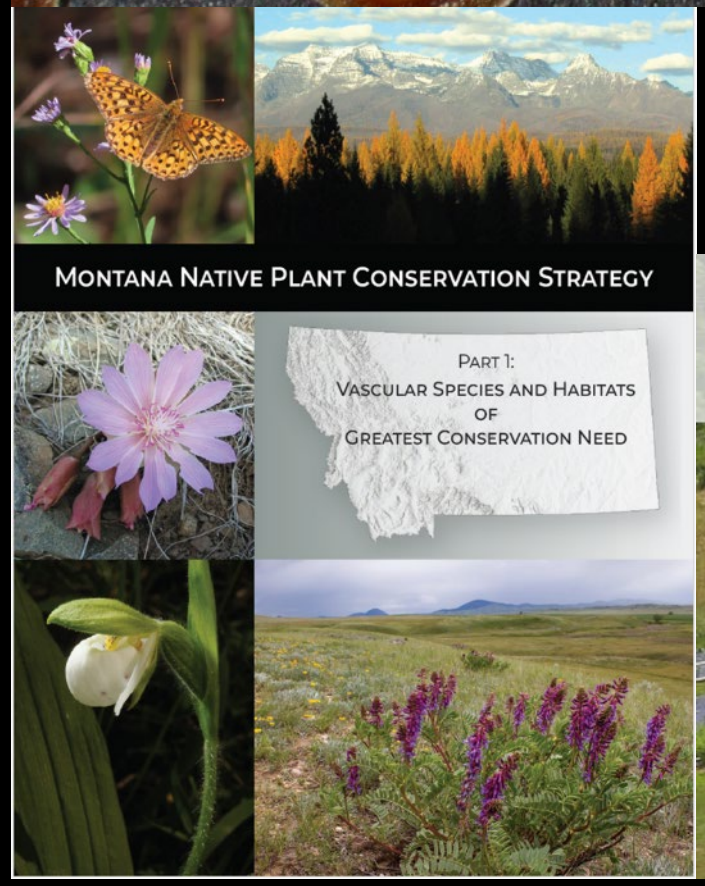
Thistle Seedhead Weevil is native to Europe.

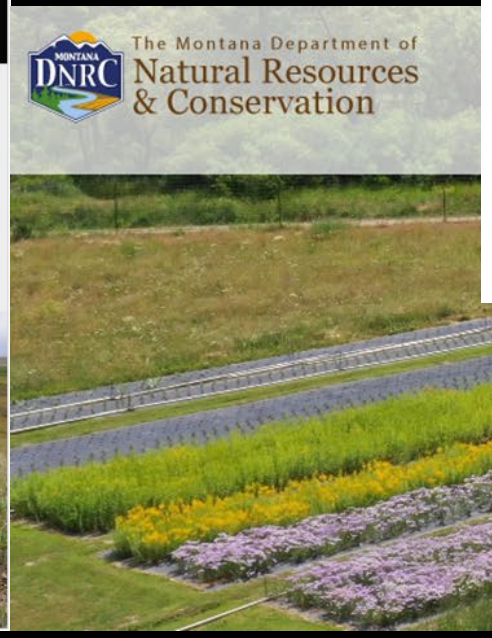
INTRODUCTION [Adapted from Winston et al. 2012 and 2016]
Thistle Seedhead Weevil was approved for release in North America to control non-native thistles. In the USA in 1969, Thistle Seedhead Weevil was released on Spiny Plumeless-thistle (*Carduus acanthoides*), Musk (*Carduus nutans*), Scotch (failed) (*Onopordum acanthium*), Italian (*Carduus pycnocephalus*), Slenderflower (*Carduus tenuiflorus*), and Milk Thistle (*Silybum marianum*) plants. Originating from host plant species in France, Thistle Seedhead Weevil was released and redistributed to numerous non-native thistle species in Canada in 1968. Originating from three host plant species in France and Italy, three strains of Thistle Seedhead Weevil were released into the USA in 1969. Releases took place in Montana and Virginia.

Habitat

HOST PLANTS
Thistle Seedhead Weevil prefers thistle species in the genus *Carduus* over those in the genus *Cirsium* (Winston et al. 2016). In the USA, Thistle Seedhead Weevil is often abundant on Musk Thistle. The weevil can also be found on other non-native thistles such as Spiny Plumeless-thistle, Bull Thistle (*Cirsium vulgare*), and Canada Thistle (*Cirsium arvense*).

The weevil naturally spread to Bull and Canada thistle plants – and also feeds on native *Cirsium* thistles (Winston et al. 2016). After populations established in the USA and Canada it was discovered to feed on many native *Cirsium* thistles. Of the 90 native *Cirsium* species in the USA, 22 have been documented to be predated upon by Thistle Seedhead Weevil (Winston et al. 2016). Predation on native thistles has even occurred in places where non-native thistles are present.





MONTANA-DERIVED NATIVE PLANT MATERIALS

Ecotype seed, Bare-root, & Containerized Stock

- In short-supply statewide
- Needed for habitat restoration, land reclamation, and landscaping
- Montana DNRC Nursery - Montana Native Seed Network is the production hub of the MT DNRC Nursery for ecotype seed

Rare Plant Seed Banking

- Need to preserve genetics of global & state rare plants
- Develop agreement for long-term storage at Rae Sellings Berry Seed Bank

Leveraging Citizen Botany & Partnerships

- To identify potential seed source locations
- To collect rare plant seed for seed-banking

Do Federal & State agencies have interest to develop partnership to collect rare plant seed for seed-banking?

Montana Native Plant Conservation Conference

Plants, Fire & Conservation

April 14-15, 2026

University of Montana, Missoula

details coming soon…

Montana Native Plant Society

https://mtnativeplants.org/

Day 1

Fire Behavior

Using Fire to Promote Native Plant & Animal Diversity

Day 2

Revising Vascular Plant State Ranks

Re-evaluating vascular plant Species of Concern?

How are various formats of digital data collection & sharing working?

Native Seed Program

Update From the Montana Native Seed Network (MTNSN)

- The MTNSN production hub at the DNRC Nursery continues to expand its ecotype seed production. 15+ species will be available for purchase (individually or custom mixes) in Spring 2026.
- The MTNSN can work with partners for specific contract grow-outs.
- The native plant material supply chain continues to develop. Contact mtnursery@mt.gov for availability and/or access to wild collected ecotype seed for propagation and/or landscape level seed-based restoration from the MTNSN seed bank.
- A robust supply chain can be developed using MTNSN ecotype seed through partnerships: Wholesale nurseries can provide liner material to retail nurseries for sales and distribution to the public.
- The Western Montana Conservation Commission (WMCC) has an initiative to accomplish these goals. Contact: Heidi.Fleury@mt.gov