Minnesota Biological Survey

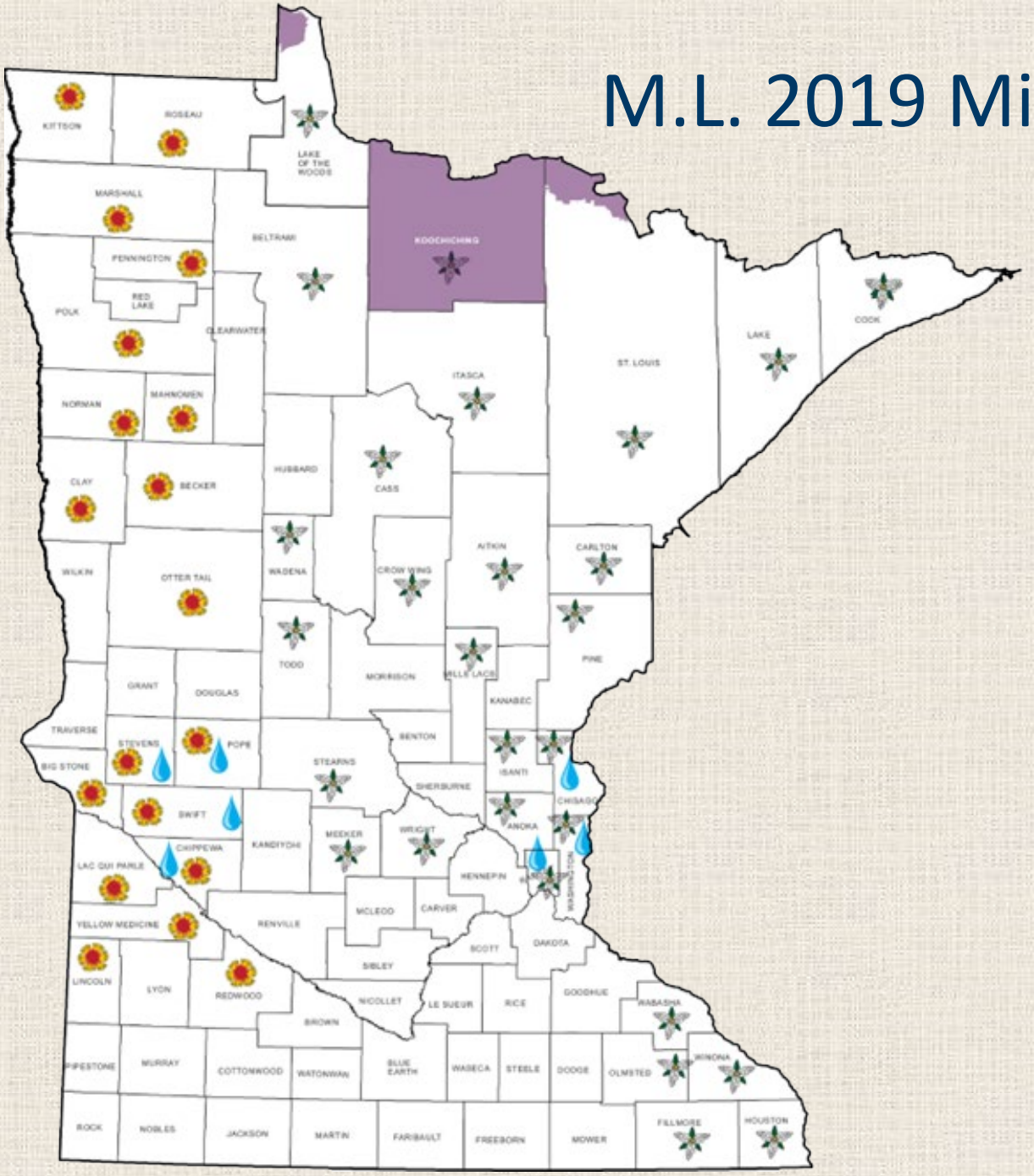
Collect, analyze, and deliver data to support biodiversity conservation.

DEPARTMENT OF NATURAL RESOURCES

The Nature Conservancy

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

M.L. 2019 Minnesota Biological Survey



Activity 1 ***County Biological Surveys***

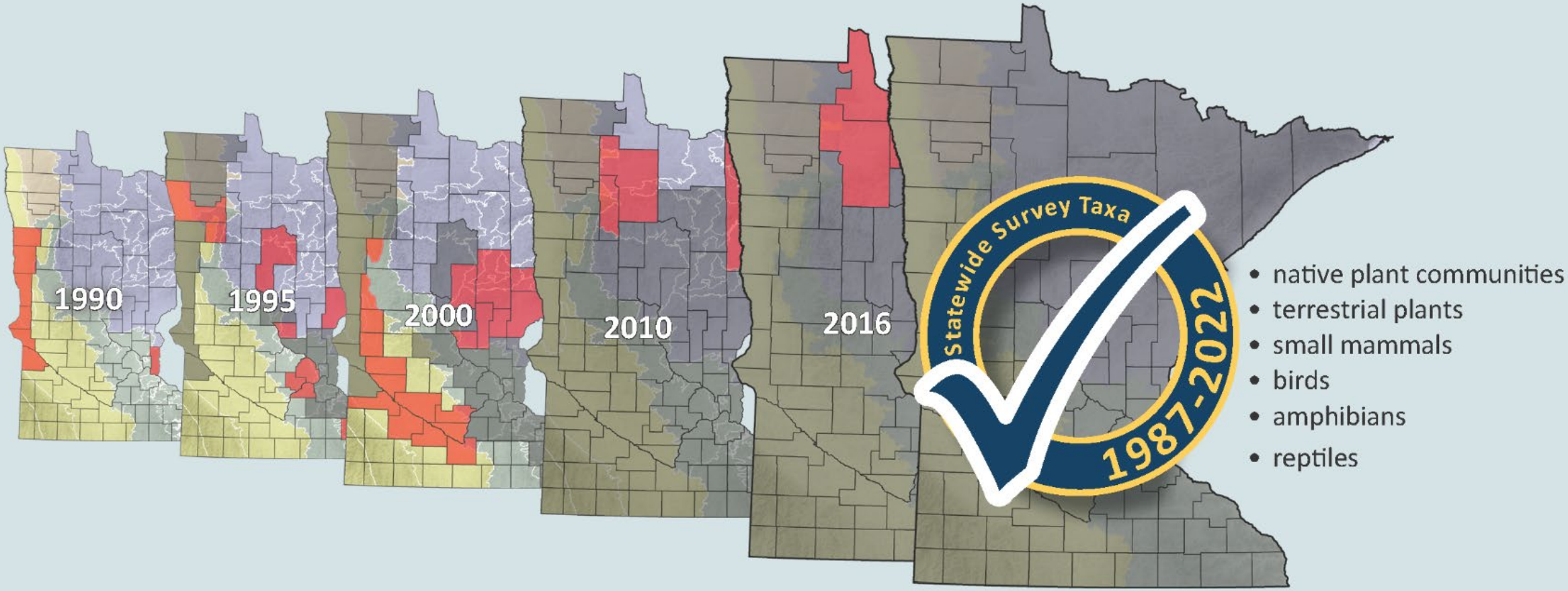
Baseline survey completed by 2022

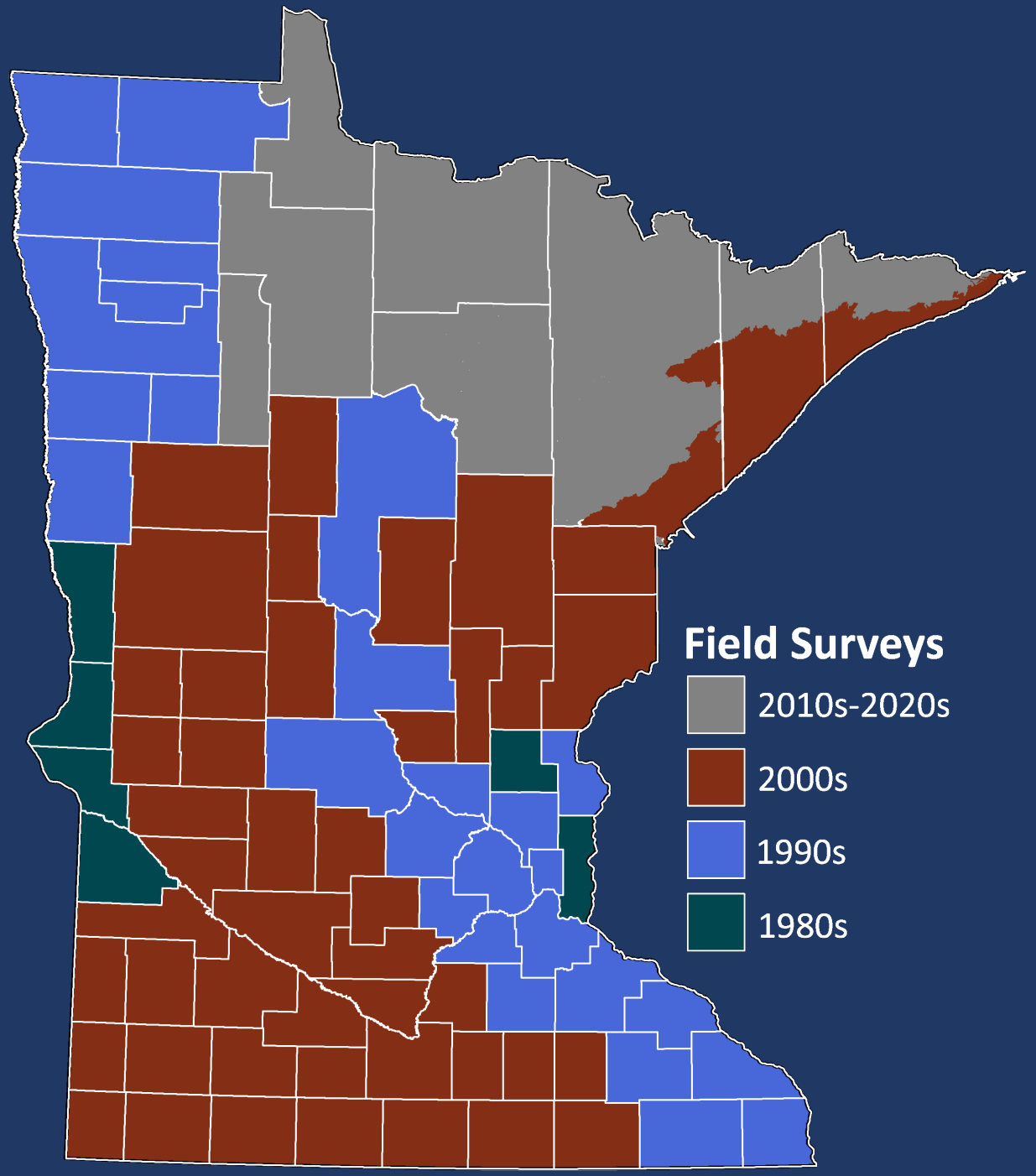
Activity 2 ***Enhance Surveys and Monitoring in High-Priority Sites and Ecological Systems***

- Prairie surveys of undocumented native vegetation and rare species
- Forest and wetland surveys for rare species, pollinators, vegetation
- Lake surveys for native and rare aquatic plants

Activity 3 ***Interpret and Deliver Survey Results***

Minnesota County Biological Survey – Completion of statewide survey





MN County Biological Survey 1987-2022

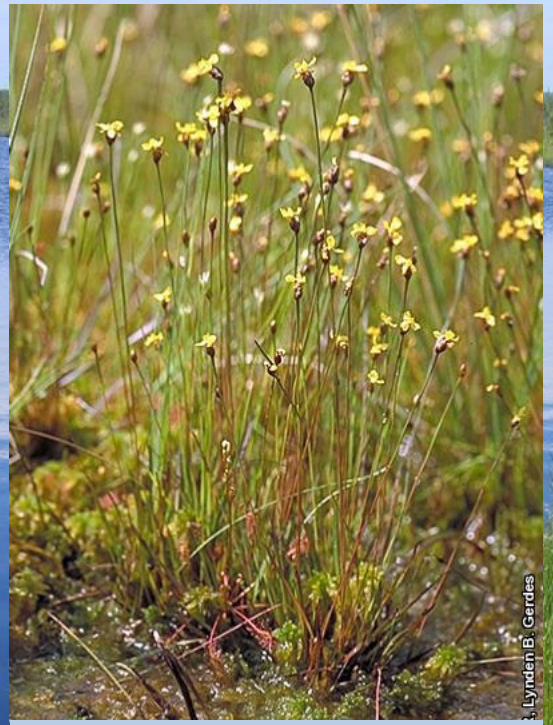
Statewide Progression

MCBS 1987-2022 By the Numbers

Native and Rare Species Observations

- **# of species observation records >275,000**
- **# of current-listed species records >17,200**
- **# of ever-listed species records >18,500**

Targeted Rare Peatland Species



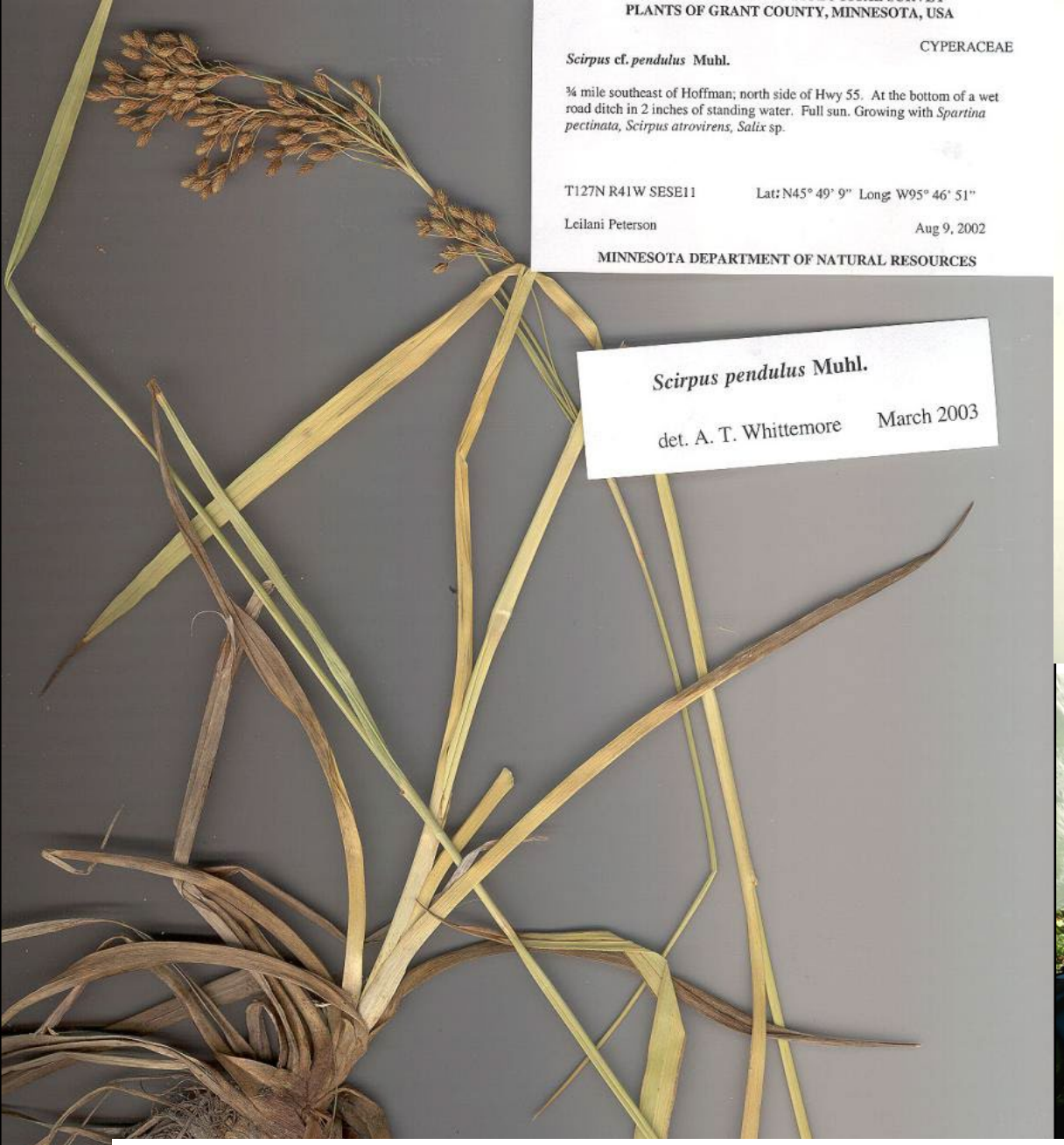
Montane Yellow-eyed Grass
(State Special Concern)

Small Green
Wood Orchid
(State Special Concern)

Linear-leaved sundew (State Special Concern)

A Species New to Science!

Diarsia sp. (an unnamed species of moth)



>63,000 plant and vertebrate animal specimens collected.

State Records of Native Plants and Animals documented by the Minnesota Biological Survey 1987-2022

Common Name	Scientific Name (authority)	Year
Animals		
A species of resin bee	*Dianthidium pudicum* (Cresson)	2018
A species of sweat bee	*Lasioglossum coreopsis* (Robertson)	2017
A species of mining bee	*Pseudopanurgus renimaculatus* (Cockerelle)	2015
A species of tortricid moth	*Eucosma millerana*[2] Wright & Brown	2014
Spotted salamander	*Ambystoma maculatum* (Shaw)	2001
Unisexual ambystomatid	*Ambystoma laterale/jeffersonianum* complex[1] (LLJ)	1994
Four-toed salamander	*Hemidactylium scutatum* (Schlegel)	1994
Vascular Plants		
Pointed watermeal	*Wolffia brasiliensis* Weddell	2020
Lance-leaved loosestrife	*Lysimachia lanceolata* Walter	2019
Rough-leaved dogwood	*Cornus drummondii* C.A. Meyer	2016
Marsh bedstraw	*Galium palustre* Linnaeus	2014
Male fern	*Dryopteris filix-mas* (Linnaeus) Schott	2014
Narrowleaf paleseed	*Leucospora multifida* (Michaux) Nuttall	2013
Algae-like pondweed	*Potamogeton confervoides* Reichenbach	2008
Slender moonwort	*Botrychium lineare* W. H. Wagner	2005
Hooker's sedge	*Carex hookerana* Dewey	2005
Canadian ricegrass	*Piptatherum canadense* (Poiret) Dom	2003
New England sedge	*Carex novae-angliae* Schweinitz	2001
Hoary whitlow grass	*Draba cana* Rydberg	2001
Case's ladies'-tresses	*Spiranthes casei* Catling & Cruise	2000
Upswept moonwort	*Botrychium ascendens* W. H. Wagner	1999
Rough-fruited fairybells	*Prosartes trachycarpa* S. Watson	1999
Eastern green-violet	*Hybanthus concolor* (T. Forster) Sprengel	1999
Spatulate moonwort	*Botrychium spathulatum* W. H. Wagner	1998
Slender rush	*Juncus subtilis* E. Meyer	1998
Robbin's spikerush	*Eleocharis robbinsii* Oakes	1995
Obovate beakgrain	*Diarrhena obovata* (Gleason) Brandenburg	1994
Carey's sedge	*Carex careyana* Torrey	1993
Blunt-lobed grapefern	*Botrychium oneidense* (Gilbert) House	1992
Purple-flowered bladderwort	*Utricularia purpurea* Walter	1992
Hairy fimbry	*Fimbristylis puberula* (Michaux) Vahl	1987
Short ray fleabane	*Erigeron lonchophyllus* Hooker	1985
Mosses & Lichens		
A species of liverwort	*Riccia sorocarpa* Bischler	2013
A species of liverwort	*Riccia huebeneriana* Lindenberg	2010
A species of moss	*Tayloria serrata* (Hedwig) Bruch & Schimper	2010
A species of moss	*Fontinalis welchiana* Allen	2010
A species of moss	*Philonotis yezoana* Bescherelle & Cardot	2009

[1]Taxa are listed at the species level, with the exception of the unisexual ambystomatid which is a complex of polyploids th reproduce through kleptogenesis. Other hybrids and subspecific taxa that were first documented in Minnesota by MBS a purposely not included on this list. [2]A newly described (2014) species.

MCBS **Aquatic Plant Surveys** 1992-2022 By the Numbers

of lakes surveyed = 2,338 in 52 counties

# of rare aquatic plant records = 1,335

State record discoveries = 5

Aquatic plant specimens = >5,000

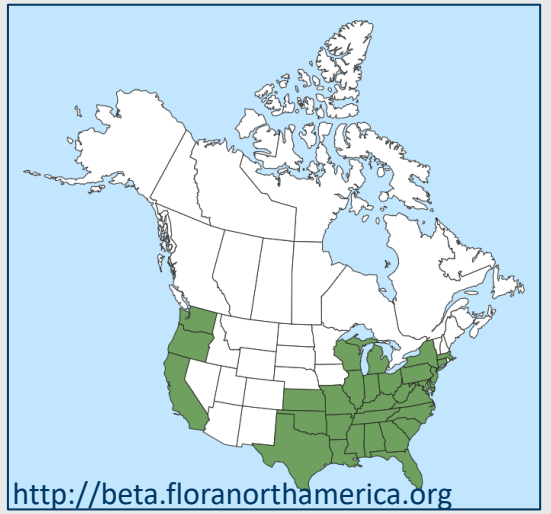
# of aquatic plants recorded = >72,000

New State Record!
Wolffia brasiliensis Weddell (Pointed watermeal)

Family: Lemnaceae
- Small, highly reduced flowering plants

Genus: *Wolffia*
- Contains smallest flowering plant in the world
- Roots absent
- Floating plants

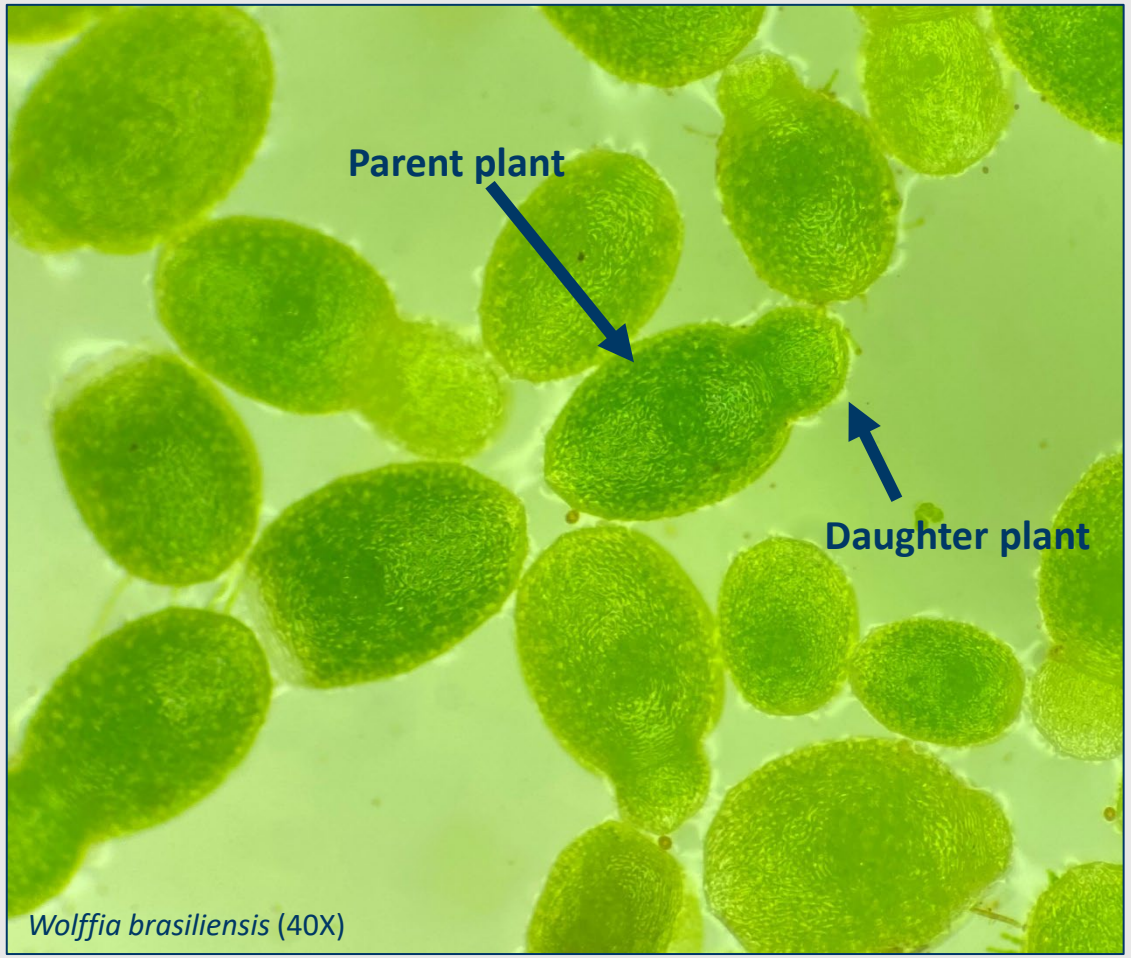

Wolffia spp.


http://beta.floranorthamerica.org

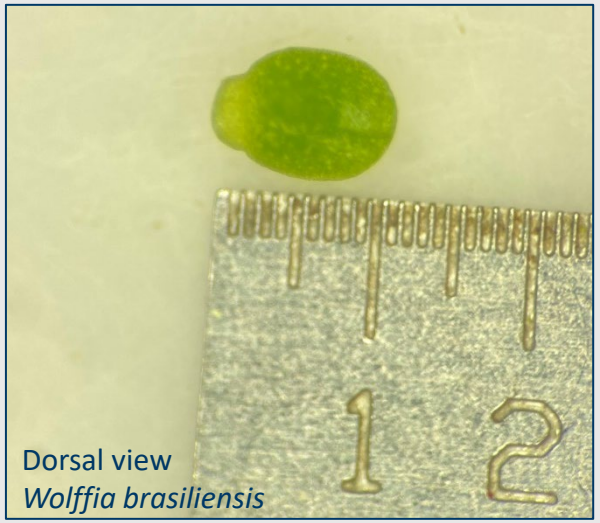
Wolffia brasiliensis
- Flowering: rarely
- Habitat: Quiet, mesotrophic to eutrophic waters
- In Minnesota:
  - Chisago, Ramsey, and Washington counties
  - Co-occurring with our two other *Wolffia* species

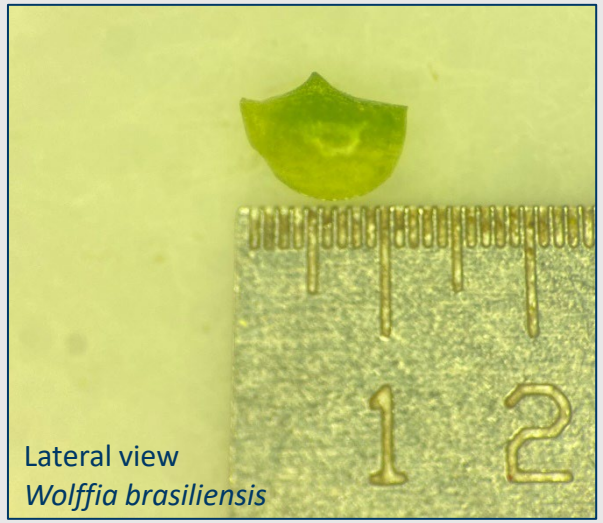

Wolffia brasiliensis habitat. Ramsey County, MN

Wolffia brasiliensis Weddell (Pointed watermeal)



Wolffia brasiliensis (40X)


Dorsal view
Wolffia brasiliensis

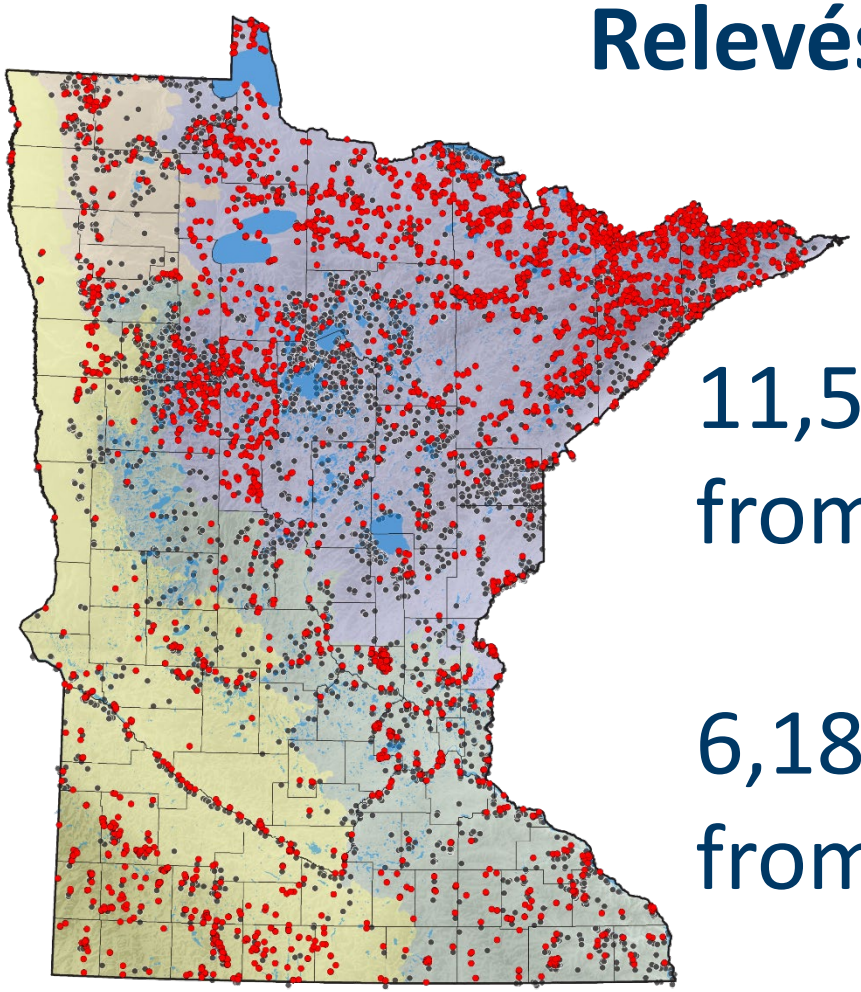

Lateral view
Wolffia brasiliensis


Mixed collection of Lemnaceae as seen from a kayak on a Ramsey County lake.

MCBS 1987-2022

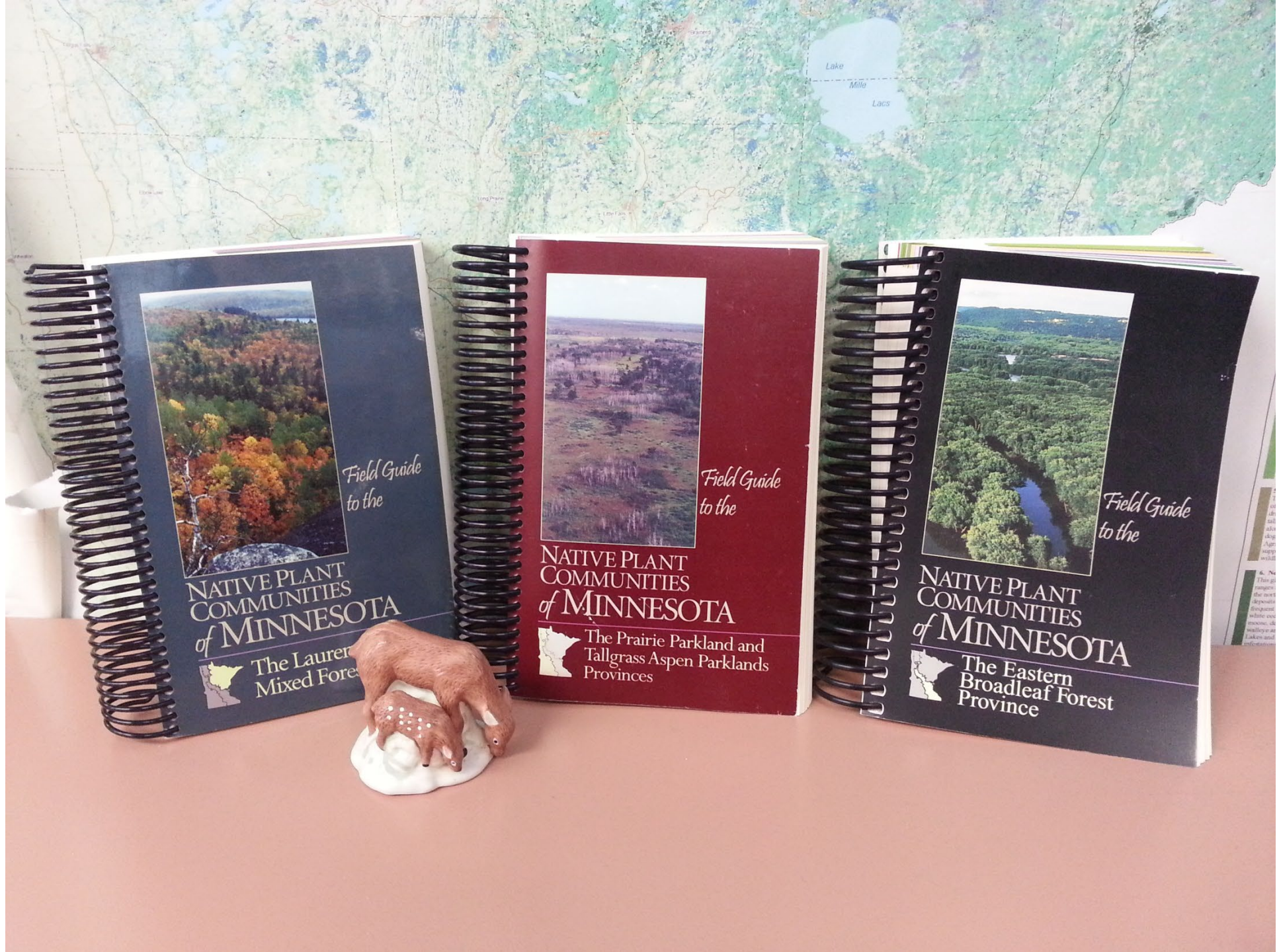
By the numbers

Relevés – vegetation plots



11,575 relevés
from all sources

6,186 relevés
from MCBS

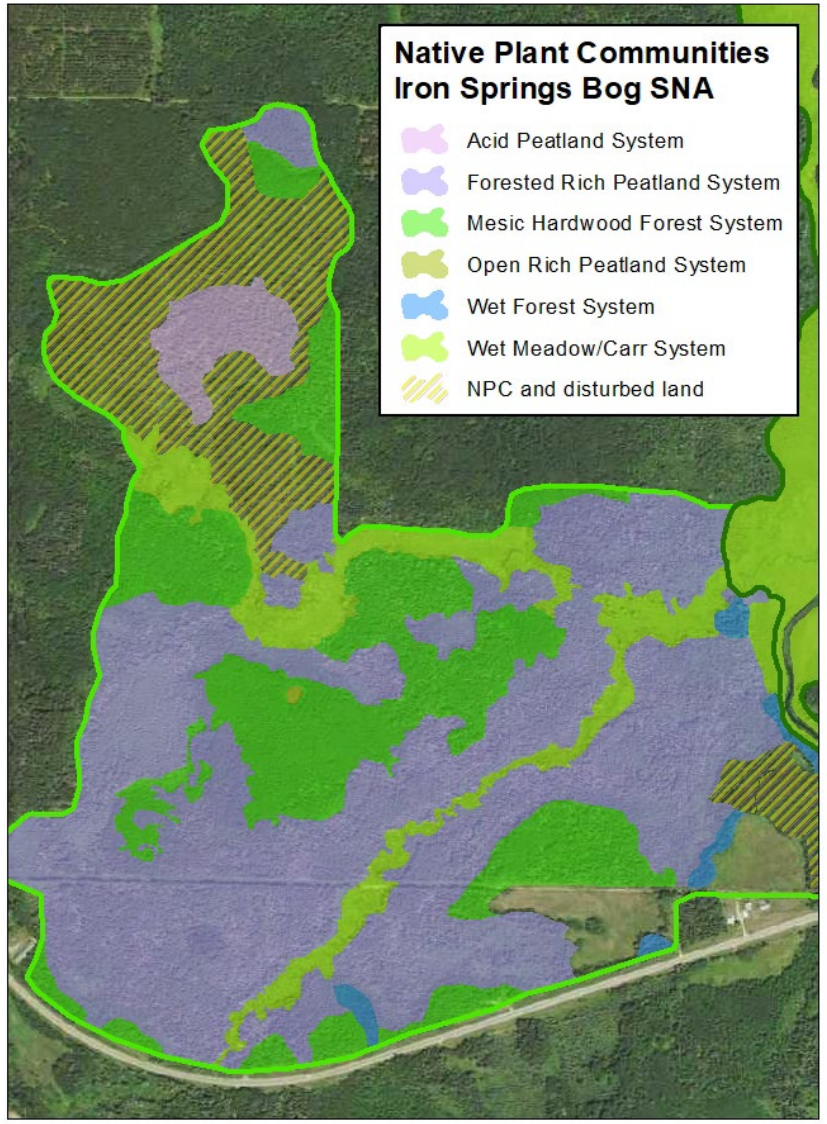

Field Guide to the
NATIVE PLANT COMMUNITIES of MINNESOTA
The Laure
Mixed Fore
Field Guide to the
NATIVE PLANT COMMUNITIES of MINNESOTA
The Prairie Parkland and Tallgrass Aspen Parklands Provinces
Field Guide to the
NATIVE PLANT COMMUNITIES of MINNESOTA
The Eastern Broadleaf Forest Province

MCBS 1987-2022 By the Numbers

MBS Native Plant Community Polygon DB

of NPC polygons **>170,299**

Total acres of NPC polygons **>5.36 million**



MCBS Sites of Biodiversity Significance Ranks

Landscape

Context &
ecological function

+

Native Plant
Communities

Quality & rarity

+

Species

Quality & rarity

=

A- Outstanding

B - High

C - Moderate

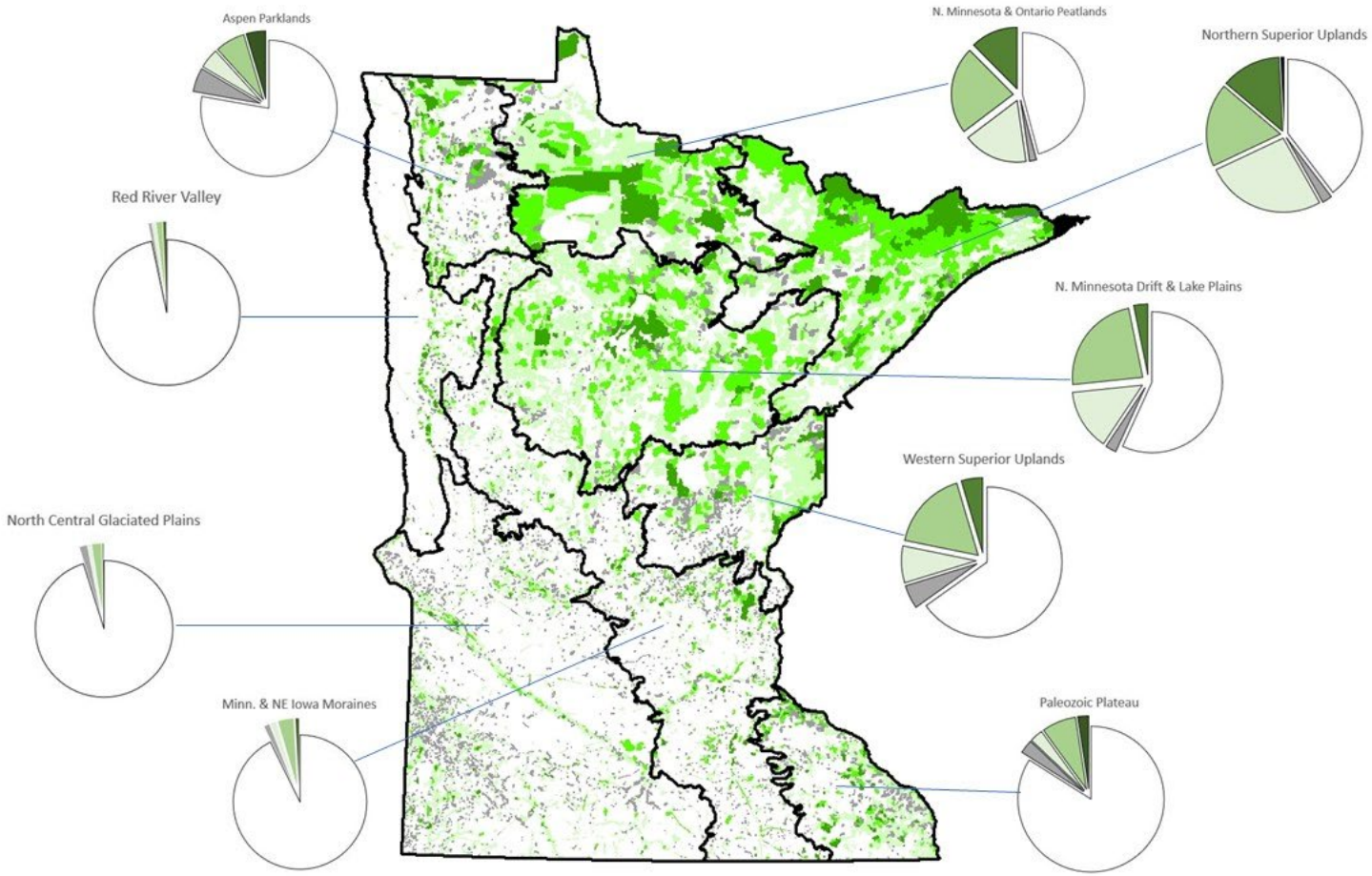
or

D - Below

MCBS Sites of Biodiversity Significance by Ecological Section

of Site polygons
>12,615

Total acres of Sites
>14.01 million



MCBS Data Making a Difference


Environmental Review

Land Protection


Land Management


Conservation Planning


Endangered Species


Calcareous Fens


Outreach


Watershed Health


Groundwater Permitting

MBS Data Downloads 2023

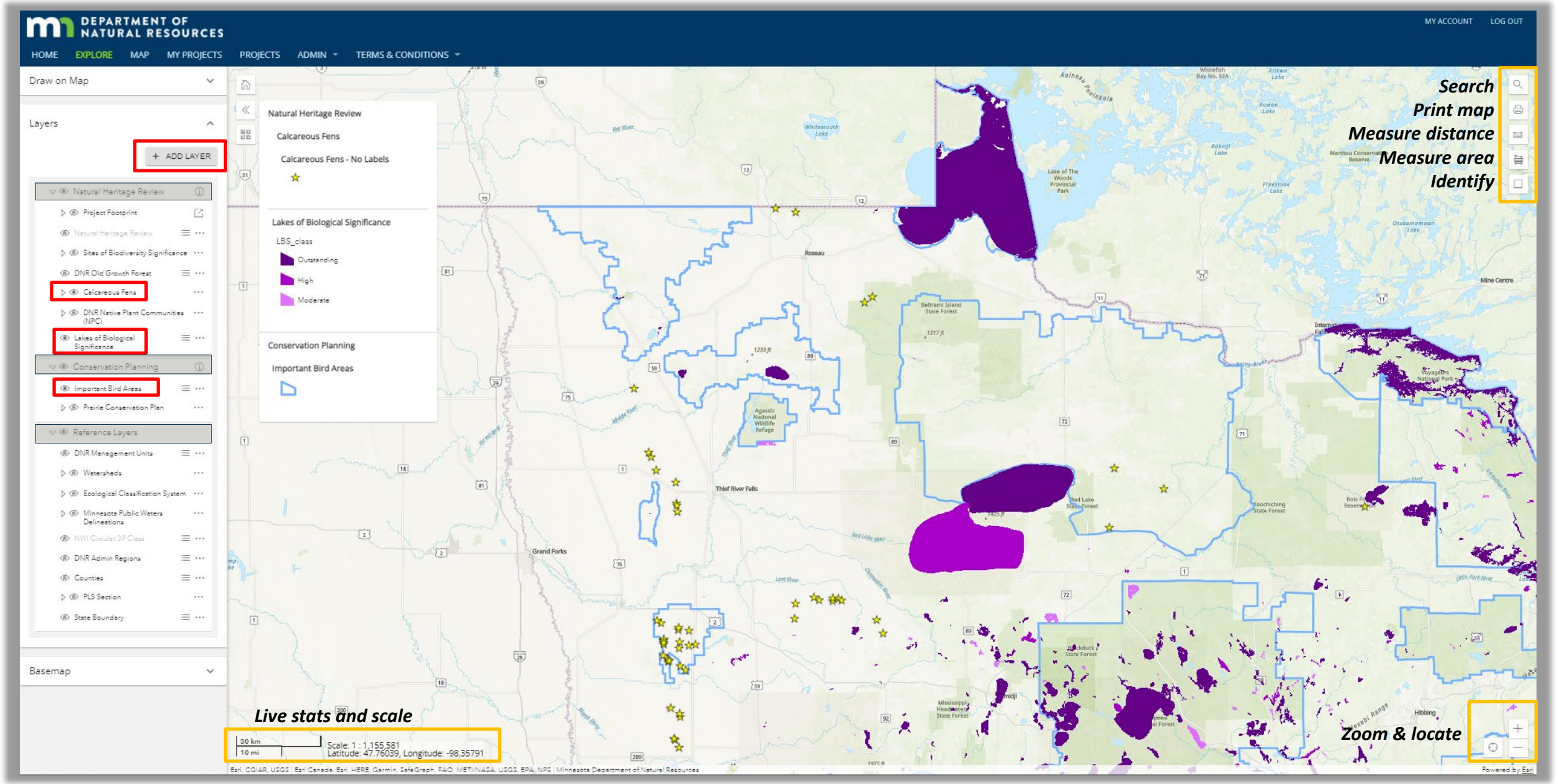
Source: DNR QuickLayers and MN Geospatial Commons

MBS Dataset	# of downloads/adds
Native Plant Communities	2,700
Rare Features Data - Nonpublic	2,500*
Sites of Biodiversity Significance	1425
Calcareous Fens - Source Feature Points	840
Native-Prairies	575
Observation Database Standardized	560*
Relevé Sites	410*
Lakes and-Aquatic Plants	270
Native Plant Communities by G-ranks	215
Railroad Prairies	125

*DNR QuickLayers only, not available on MNGC.

Minnesota Conservation Explorer

Webmap – MN Conservation Explorer



Conservation Planning Report

DEPARTMENT OF NATURAL RESOURCES

Conservation Planning Report: Iron Springs Bog - CPR

This document is intended for planning purposes with respect to the area of interest defined by the user. The data layers can be viewed in the Map Tab of the Minnesota Conservation Explorer. Please visit MN Geospatial Commons for downloadable GIS data.

This document does not meet the criteria for a Natural Heritage Review. If a Natural Heritage Review is needed, please click on the Natural Heritage Review option in the Map Tab of the Minnesota Conservation Explorer.

MBS Sites of Biodiversity Significance

Minnesota Biological Survey (MBS) Sites of Biodiversity Significance are areas with varying levels of native biodiversity that may contain high quality native plant communities, rare plants, rare animals, and/or animal aggregations. A Biodiversity Significance Rank is assigned on the basis of the number of rare species, the quality of the native plant communities, size of the site, and context within the landscape. MBS Sites are ranked Outstanding, High, or Moderate. Areas ranked as Below were found to be disturbed and are retained in the layer as negative data. These areas do not meet the minimum biodiversity threshold for statewide significance but may have conservation value at the local level as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, or as areas with high potential for restoration of native habitat.

Wetlands within MBS Sites of Outstanding or High Biodiversity Significance may be considered Rare Natural Communities under the Wetland Conservation Act. For technical guidance on Rare Natural Communities, please visit WCA Program Guidance and Information.

For more information please visit MBS Sites of Biodiversity Significance.

The following MBS Sites of Biodiversity Significance are within the search area:

MBS Site Name	Biodiversity Significance	Status
Iron Springs Bog SNA	Outstanding	final
Itasca 15	High	final

DNR Native Plant Communities

A native plant community is a group of native plants that interact with each other and with their environment in ways not greatly altered by modern human activity or by introduced organisms. These groups of native plant species form recognizable units, such as oak savannas, pine forests, or marshes, that tend to repeat over space and time. Native plant communities are classified and described by considering vegetation, hydrology, landforms, soils, and natural disturbance regimes.

DNR Native Plant Community types and subtypes are given a Conservation Status Rank that reflects the relative rarity and endangerment of the community type in Minnesota. Conservation Status Ranks range from S1 (critically imperiled) to S5 (secure, common, widespread, and abundant). Native plant communities with a Conservation Status Rank of S1 to S3 are considered rare in the state. The DNR recommends avoidance of rare native plant communities.

Wetland native plant communities with a conservation status rank of S1 to S3 may be considered Rare Natural Communities under the Wetland Conservation Act. For technical guidance on Rare Natural Communities, please visit WCA Program Guidance and Information.

DNR Native Plant Communities may be given a Condition Rank that reflects the degree of ecological integrity of a specific occurrence of a native plant community. The Condition Rank is based on species composition, vegetation structure, ecological processes and functions, level of human disturbance, presence of exotic species, and other factors. Condition Ranks range from A-rank (excellent ecological integrity) to D-rank (poor ecological integrity. A Condition Rank of NR means Not Ranked and a Condition Rank of MULTI mean multiple ranks are present because the record is a native plant community complex.

For more information please visit Minnesota's Native Plant Communities.

The following DNR Native Plant Communities are within the search area:

MBS Site Name	NPC Code	Native Plant Community Classification	Conservation Status Rank	Number of Communities
Iron Springs Bog SNA	APn81	Northern Poor Conifer Swamp	(S4, S5)	2
Iron Springs Bog SNA	FPn63b	White Cedar Swamp (Northcentral)	S3	11
Iron Springs Bog SNA	FPn73a	Alder - (Maple - Loosestrife) Swamp	S5	7
Iron Springs Bog SNA	FPn82	Northern Rich Tamarack Swamp (Western Basin)	(S4, S5)	2
Iron Springs Bog SNA	FPn82b	Extremely Rich Tamarack Swamp	S4	2
Iron Springs Bog SNA	MHc26	Central Dry-Mesic Oak-Aspen Forest	(S4)	4
Iron Springs Bog SNA	MHn44	Northern Wet-Mesic Boreal Hardwood-Conifer Forest	(S2, S3, S3S4, S4)	6
Iron Springs Bog SNA	OPn92	Northern Rich Fen (Basin)	(S4)	1
Iron Springs Bog SNA	WFn55	Northern Wet Ash Swamp	(S3, S4)	2
Iron Springs Bog SNA	WFn55a	Black Ash - Aspen - Balsam Poplar Swamp (Northeastern)	S4	2
Iron Springs Bog SNA	WMn82a	Willow - Dogwood Shrub Swamp	S5	4
Iron Springs Bog SNA	WMn82b	Sedge Meadow	S4 or S5	3
Itasca 15	WMn82a	Willow - Dogwood Shrub Swamp	S5	6
Itasca 15	WMn82b	Sedge Meadow	S4 or S5	4
Not Within MBS Site	FPn73	Northern Rich Alder Swamp	(S5)	2
Not Within MBS Site	WFn55a	Black Ash - Aspen - Balsam Poplar Swamp (Northeastern)	S4	1

Calcareous Fens

A calcareous fen is a rare and distinctive peat-accumulating wetland that is legally protected in Minnesota under the Wetland Conservation Act. Many of the unique characteristics of calcareous fens result from the upwelling of groundwater through calcareous substrates. Because of this dependence on groundwater hydrology, calcareous fens can be affected by nearby activities or even those several miles away. For more information regarding calcareous fens, please see the Calcareous Fen Fact Sheet or review the List of Known Calcareous Fens.

No features were found within the search area.

MN Old Growth

Old-growth forests are natural forests that have developed over a long period of time, generally at least 120 years, without experiencing severe, stand-replacing disturbances such as fires, windstorms, or logging. Old-growth forests are a unique, nearly vanished piece of Minnesota's history and ecology; less than 4% of Minnesota's old-growth forests remain. The DNR recommends avoidance of old growth forests.

No features were found within the search area.

MN Prairie Conservation Plan

The Minnesota Prairie Conservation Plan, a twenty-five year strategy for accelerating prairie conservation in the state, identifies Core Areas, Corridors, and Corridor Complexes as areas to focus conservation efforts. The Plan's strategies include protection, enhancement, and restoration of grassland and wetland habitat. To meet the Plan's goals, approaches within Core Areas will need to include restoration and approaches within Corridors will need to include conservation of grassland habitat which can provide stepping stones between larger Core Areas.

No features were found within the search area.

Important Bird Areas

Important Birds Areas, identified by Audubon Minnesota in partnership with the DNR, are part of an international conservation effort aimed at conserving globally important bird habitats. They are voluntary and non-regulatory, but the designation demonstrates the significant ecological value of the area.

The following Important Birds Areas are within the search area:

- Itasca State Park

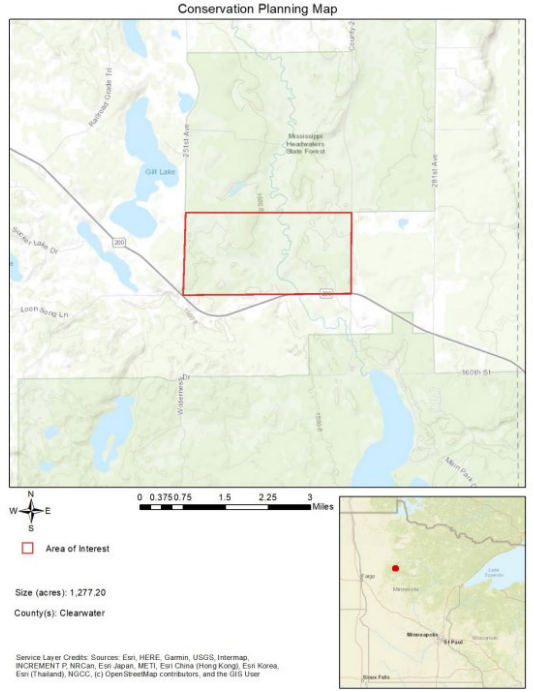
Lakes of Biological Significance

The Lakes of Biological Significance are high quality lakes as determined by the aquatic plant, fish, bird, or amphibian communities present within the lake. To be included in this layer, a lake only needs to meet the criteria for one of these four community types. The lake is assigned a biological significance of Outstanding, High, or Moderate based on the community with the highest quality.

No features were found within the search area.

Iron Springs Bog - CPR

Conservation Planning Map



Area of Interest

Size (acres): 1,277.20

County(s): Clearwater

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User

DNR Online Rare Species Guide

Rare Species Guide

- Welcome to Minnesota's guide to endangered, threatened, and special concern species.
- Get information on the status, distribution, ecology, conservation and management of our rarest animals and plants.
- Query 439 species profiles based on name, taxonomic group, status, county, watershed, ECS subsection, and/or habitat.

Why species become rare

Find a rare species

- A-Z search
- Keyword search
- Filtered search

Information

- About this guide
- Status definitions
- Laws
- Permits
- Report sightings
- State list PDF

Links

- Additional resources
- NatureServe EXT
- Federal information EXT
- Ecological Resources

Huperzia

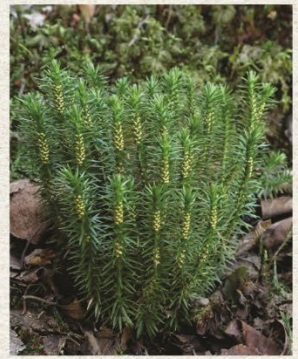
Dendrolycopodium

Lycopodium

Diphasiastrum

Spinulum

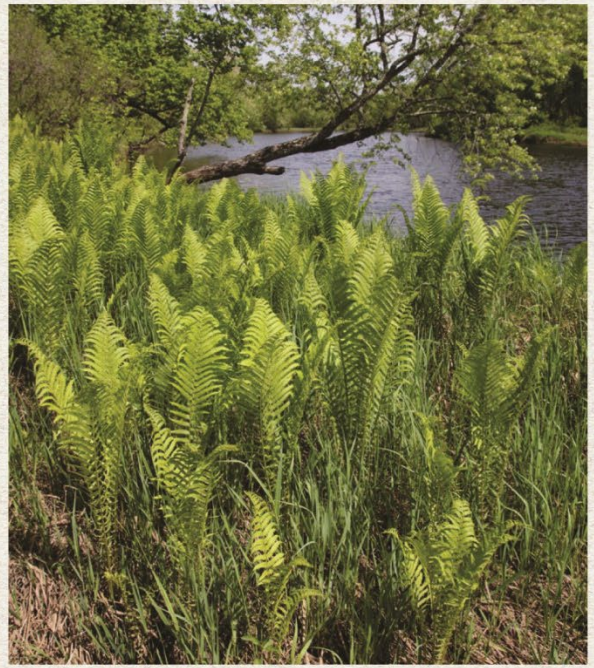
Lycopodiella



FERNS and LYCOPHYTES of MINNESOTA

Welby R. Smith | Photography by Richard W. Haug

Minnesota Department of Natural Resources



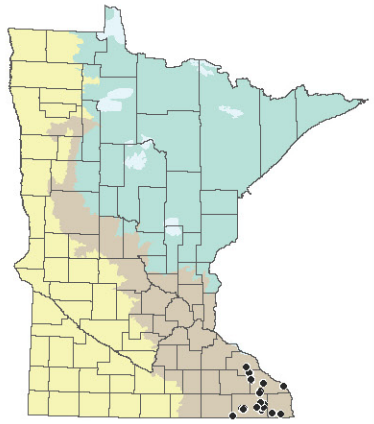
The **COMPLETE GUIDE** to Species Identification

Dryopteris filix-mas (L.) Schott
male fern

Rhizomes horizontal, to 15+ cm long, branching occasionally, covered with persistent petiole bases and semi-persistent orange-brown scales. **Leaves** monomorphic, 30—100 cm long, 12—36 cm wide; fertile leaves die back in winter; some sterile leaves (those produced in mid-summer) remain green during winter. **Petiole** non-glandular; scaly, especially near the base; scales with both broad and hairlike form. **Blade** green, narrowly elliptic to narrowly obovate, 1-pinnate-pinnatifid to 2-pinnate, non-glandular. **Pinnae**: Marginal teeth blunt or broadly pointed, not spine-tipped. **Sori** attached on veins away from margins. **Indusia** roundish with a narrow sinus, 0.5—1.5 mm across, non-glandular. **Phenology**: Sterile leaves emerge in the spring about a week before fertile leaves. Fertile leaves shed spores in mid-summer and die back in winter; some sterile leaves stay green all winter.

Identification: *Dryopteris filix-mas* is commonly called male fern, as a companion to lady fern (*Athyrium filix-femina*, page xx). Both were named long ago when little was known about the biology of ferns. A fertile specimen of *D. filix-mas* (one with sori) should key without difficulty, although it might not stand out as anything unusual in the field. Compared to other species of *Dryopteris* found in Minnesota it has a rather short petiole, marginal teeth lacking a spine at the tip, and the blade divided only twice.

Natural History: *Dryopteris filix-mas* occurs in scattered temperate and sub-boreal habitats in North America and Eurasia. Although not globally rare, reliable repots of its occurrences are rather spotty, and an overall pattern of distribution relative to Minnesota is obscure. It was only recently discovered in the southeastern tip of Minnesota. Little is known about locations or habitats where it might be found next. It will likely be in woodlands of some sort, probably ravines or slopes, perhaps tending more to dry than moist, and possibly associated with limestone bedrock. The stream-dissected terrain of southeastern Minnesota seems to offer the best habitats, and more sites will likely be found as botanical exploration proceeds, then a clearer picture of its status may emerge.



Growing in a steep, wooded ravine, Fillmore County

Typical leaf.

Sporangia.

Stipe with two types of scales - broad, and hair-like,

THANK YOU!