Minnesota Plant Press

The Minnesota Native Plant Society Newsletter

The Minnesota Native Plant Society – *A non-profit organization dedicated to the conservation and appreciation of Minnesota's native plants and plant communities* through education *and public awareness.*

Volume 40 Number 2 **July 2025**

Assessing and Assigning Conservation Status Ranks to Minnesota's Vascular Plant Flora

by **Derek Anderson** ***(Botanist, MN Department of Natural Resources)***

Over the last year or so, perhaps you've heard a friend or colleague mention the term 'S-Ranks.' Perhaps you have overheard someone using the term in a passing conversation but have been left puzzled by this unfamiliar vocabulary. Well, look no further.

The idea of species conservation ranking comes from NatureServe, a conservation partner bringing together biodiversity data across state and country boundaries. Standard language and data management methods are critical to this task. One of the ways this is accomplished is through species conservation status ranking. This can be done at a variety of spatial scales, globally, nationally, or subnationally (*e.g.,* state or province). Depending on the level, a prefix is applied to the rank (G = Global, N = National, S = Subnational; in our case the state of Minnesota is the 'subnation'). This letter is then followed by a number or letter, signifying the risk of a particular species becoming extinct at the designated spatial scale. **Table 1** provides a definition for each of these levels.

How were S-Ranks Calculated?

The process of determining the conservation rank for a particular species considers several factors. These include the species' rarity, threats and trends. Information for all these factors is not often available for most species, but the calculator tool developed by NatureServe can still provide value with partial information and it can also incorporate uncertainty that might exist for any particular factor. The calculator gives more weight to species' rarity factors as these data are usually more readily available and verifiable.

Botanists with the Minnesota Biological Survey (MBS) utilized several data sources to help us assess the rarity factors for the vascular plants of Minnesota. These sources included our Natural Heritage Information System (NHIS) rare features database, the University of Minnesota Bell Atlas vascular plant collection database, our Releve database, and several national and state forestry resources. The professional expertise of other botanists was also considered during the review process. MBS staff helped to compile these resources, and then using Geographic Information Systems (GIS) spatial processing tools, calculated the rarity factor values.

Rarity Factors

The rarity factors only consider the more recent observations of a species that can reasonably be

Table 1. Definitions of Minnesota S-Ranks

Minnesota Rank (S-Rank)	Definition
S1	**Critically Imperiled** — At very high risk of extinction due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
S2	**Imperiled** — At high risk of extinction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S3	**Vulnerable** — At moderate risk of extinction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
S4	**Apparently Secure** — At fairly low risk of extinction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
S5	**Secure** — At very low risk or extinction due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.
SH	**Historical or Possibly Extinct/Extirpated** - Known from only historical occurrences but still some hope of rediscovery.
SX	**Presumed Extinct/Extirpated** — Not located despite intensive searches and virtually no likelihood of rediscovery.
SNA	**Not Applicable** — A conservation status rank is not applicable because the species is not a suitable target for conservation activities. (e.g., non-native species)
SNR	**Not Ranked** – Rank has not been assessed.
SU	**Unrankable** — Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

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The *Minnesota Plant Press* is the newsletter of the Minnesota Native Plant Society. The newsletter is published quarterly, in January, April, July, and October. The deadline for contributions, which are welcome, is the first day of the publication month. Scientific names follow MNTaxa. Send articles, photos, suggestions, etc. to the co-editors, Brian Johnson & Steve Saupe at editors@mnnps.org. The Society officers are listed below:

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presumed still present in the state. Since this is the first time we have assessed all the vascular plant species in the state, we looked at records going back to 1980. The rarity factors we examined were range extent, area of occupancy and number of occurrences (or populations).

- **Range Extent** – This is the minimum area that can be drawn around all the present occurrences of a species found within the state.
- **Area of Occupancy** – The range extent is divided into a grid of 2 km x 2km cells. This factor then counts all the cells within the range extent where the species has been documented.
- **Number of Occurrences** – This is a count of the number of extant locations (populations) documented in the state.

Threats

Threats are more difficult to calculate. Major threat categories developed by the International Union for Conservation of Nature (IUCN) were used to determine an overall threat level for an individual species. These twelve broad ranging categories include everything from development, resource use, natural system modifications, invasive species, pollution and climate change. For many species, we lacked sufficient information to fully assess the threats, and in these instances, threats were not included in the S-Rank assessment.

Trends

Trends look at the status of a species over time. This could be looking at how the number of individuals in a population change over time, or how the number of populations in the state is changing over time. Like threats, trends are also difficult to assess, as this information was lacking for many of our vascular plant species. Like threats, trends were not utilized in the S-Rank analysis if data were not available.

How will S-Ranks be used?

S-Rank can help inform species conservation on a global scale as well as within the State of Minnesota. Since we followed the same process for assigning S-Ranks that other state programs of the NatureServe network used (**Figure 1**), it allows for a more comparable conservation assessment of a species on a larger scale (such as federally listing a species). Additionally, the S-Ranks can be an important component to inform other aspects of conservation.

One example is Species of Greatest Conservation Need (SGCN). This is a designation required by the U.S. Fish and Wildlife Service for the use in State Wildlife Action Plans. These documents serve as a basis for prioritizing conservation efforts. Another example of the utility of S-Ranks can be seen in the state listing

Table 2. Minnesota S-ranks

Rank	Taxa	Notes
S1	139	Critically imperiled taxa.
S2	185	Imperiled taxa.
S3	433	Vulnerable taxa.
S4	605	Apparently secure taxa.
S5	291	Secure taxa.
SNA	533	Non-native/introduced or hybrid taxa with no conservation value.
SU	243	Taxa with insufficient information to assign a rank at this time.

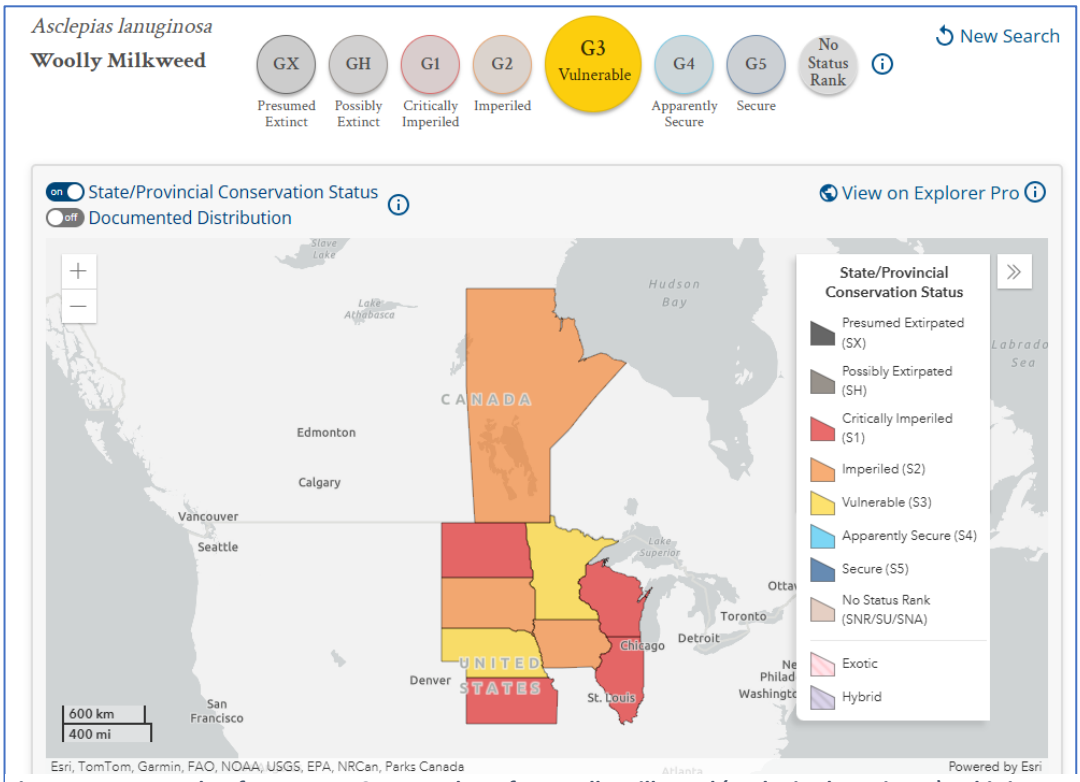


Figure 1. A screen shot from NatureServe Explorer for Woolly Milkweed (Asclepias lanuginosa). This is a species that is critically imperiled to vulnerable (S1 to S3) in all the jurisdictions where it has been documented. The combined information helps to determine that the species is Vulnerable (or G3) on a global scale.

process. By compiling data from multiple resources, the DNR has taken the first step in assessing risk of extirpation of a given species from the state. The next steps will be more closely reviewing rarity, threats and trends of the more at-risk species to determine the appropriate status, and finally making a recommendation for state listing status, if warranted.

Minnesota's Vascular Plant S-Ranks

We examined 2,474 vascular plant taxa. This number includes species, subtaxa (species that have more than one subspecies or variety in Minnesota), and a few hybrids. Table 1 and **Figure 2** show a breakdown of each conservation status for the taxa we reviewed.

One of the many things we learned during this process is that there are several 'weedy' but native taxa that are not often documented in our traditional surveying efforts. Giant ragweed (*Ambrosia trifida*) is a prime example. This species is found along roadsides, and disturbed places throughout much of the state. However, these habitats are overlooked or not often documented in traditional survey work. This review process also brought to our attention many species that may be rarer than we thought. As a result, some of these species may be added to our Watchlist to help encourage data collection and future refinement of their conservation status ranks (S-Ranks).

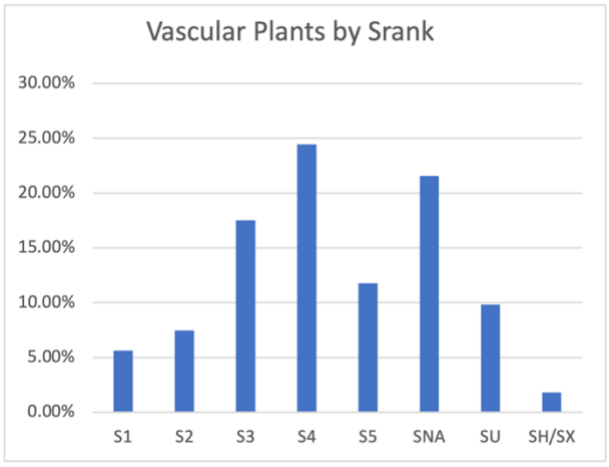


Figure 2. A bar graph showing the percentage of vascular plant taxa falling into each conservation status rank

Looking forward, we are planning to make the S-Ranks available as an attribute of our MNTaxa database. The S-Ranks will also eventually be incorporated into the NatureServe database. And, after that point, they will be available on the NatureServe Explorer website.

In the future, we will be able to build off the work of this initial assessment and hopefully improve steps in the process. We will also work toward filling in knowledge gaps for species including their distribution, abundance and more thorough threat assessments.

Additional Resources

- Minnesota Biological Survey
- Minnesota's Rare Species Guide
- NatureServe
- NatureServe Explorer

Notes from the Herbarium

by Tim Whitfeld *(Collections Manager of the Bell Museum Herbarium at the University of Minnesota)*

From time to time, we receive communication from individuals looking to donate a batch of old specimens they've turned up while clearing out their basements or reorganizing their attics. In most cases, the specimens were collected by a distant ancestor, probably for a college or high school project, in an era well before widespread indoor plumbing.

Sadly, more often than not we're unable to accept the specimens because they lack dates and locations (a requirement for all scientific collections) or they're crumbling into dust after decades in storage. Occasionally, however, some treasures do appear. This was the case recently when I was contacted by a person from Edmond, Oklahoma asking if we might be interested in receiving a volume of bound and pressed plant specimens, collected in Minnesota in the late 1800s.

Our friend from Oklahoma had purchased the volume from a farm auction thirty-five years prior but knew nothing of their provenance. Since the specimens were originally from Minnesota, he felt they should be repatriated to their home state so he sent some pictures for me to assess their condition. Based on these images I could see the specimens were mostly in good condition with at least bare-bones collection information and it wasn't long before a package from Oklahoma arrived containing 71 pressed plant specimens in a slightly battered, but still intact, binding.

The specimens were all collected in 1887, between April and September. There's no mention of who made the collections, but they came from southeast Minnesota, in the area around Lake City and Frontenac. Many of the specimens also mention "Villa Maria" as the collection location. With a little digging, I found an article written by Ettie Madeline Vogel in the Records of the American Catholic Historical Society of Philadelphia (1886), which mentions a convent (Villa Maria Academy) established by "a community of eleven professed Ursuline Sisters of the Roman Union, Central Province," in Lake City, Minnesota. The Sisters established the school for girls in 1891 on a high bluff overlooking the Mississippi River. By the mid-1940s,

Figure 3. Pasqueflower from the "Villa Maria" collection. Image courtesy Tim Whitfeld.

more space was needed for the school so a new building was constructed (Marian Hall) in the style of a French chateau. Sadly, the original school buildings were destroyed in a fire in March 1969 and, although Marian Hall was not damaged, the school ended up closing later that year. The Sisters then transitioned to using their site as a retreat center, which closed in 2016, and the property was subsequently sold to a developer who turned Marian Hall into an event center.

This all happened after our collector (maybe one of the eleven professed?) made their herbarium specimens in 1887. She(?) focused much of her attention on common spring wildflowers so, among other species, there are collections of pasqueflower (April 12, 1887; **Figure 3**), hepatica (April 25), bloodroot (April 30), and Jacob's ladder (May 4). The collector must have ventured into wet areas because there's a specimen of marsh marigold (May 5; **Figure 4**) and she must have explored some of the area's goat prairies where she encountered hoary puccoon on May 13, prairie smoke on May 4 (**Figure 5**), and scarlet paintbrush on May 13. There's also a specimen of yellow lady's slipper from May 18 and, later in the summer, wild mint (July 26) and jewelweed (August 8). Overall, she collected a good cross-section of plants from a variety of habitats.

As with all herbarium specimens, the collections provide a snapshot of plant diversity from this time and place. They also provide other information that the original collector couldn't have anticipated. For example, the specimens document flowering dates in the late 1800s for each of the included species. This information can be used as a comparison for flowering dates in the 21st century, to document the effect of climate change on plant phenology.

We'll probably never know who made the collections but one thing we do know is whoever it was had excellent handwriting and a keen interest in the flora of southeastern Minnesota! They can rest easy knowing that, after a peripatetic first 138 years, the specimens will be secure in the Bell Museum Herbarium for many decades to come

Figure 4. Marsh marigold (Caltha palustris) from the "Villa Maria" collection. Image courtesy Tim Whitfeld.

Figure 5. Prairie smoke (Geum triflorum) from the "Villa Maria" collection. Image courtesy Tim Whitfeld.

A Unique Plant Community: White Pine–Red Maple Swamps of Glacial Lake Wisconsin

by **Steve Eggers** ***(Senior Ecologist, US Army Corps of Engineers)***

White Pine (*Pinus strobus*)–Red Maple (*Acer rubrum*) Swamps (**Figure 6**) are a rare community occurring on wet-mesic sites along headwater streams and within groundwater seepages in and around the bed of extinct Glacial Lake Wisconsin (**Figure 7**). A high groundwater table and sandy soils with a thin layer of living Sphagnum mosses, but minimal peat accumulation, are typical. Inundation does not occur. Microtopography is present and primarily occurs from wind-thrown canopy trees. Overall, these communities meet the three technical criteria for wetlands—hydric soils, wetland hydrology and dominance by hydrophytes (wetland plants) – in accordance with the methodology applied by federal and state agencies: the Corps of Engineers Wetlands Delineation Manual (1987 *Manual*) and applicable regional supplement. White pine is not typically thought of as a wetland tree species so its occurrence as a dominant in this wetland community is interesting. The National Wetland Plant List, which assigns one of five ratings to each plant species as to its frequency of occurrence in wetlands (**Table 3**), applies a rating of "facultative-upland" (FACU) to white pine which means that it usually occurs in uplands but occasionally occurs in wetlands. Thus, the occurrence of a facultative-upland species in wetlands is not unusual, but occurrence as a dominant is. Tree size white pines in this community frequently exhibit what is referred to as a "morphological adaptation" to survival in wetlands – forming shallow root systems and raised hummocks to keep as much of its root system as possible above the zone where soils are saturated /anaerobic. In comparison, red maple is assigned a rating of "facultative" (FAC) which means it occurs with more or less equal frequency in both wetlands and uplands.

White Pine–Red Maple Swamps are often transitional between xeric upland forest communities of oak (*Quercus* spp.), pine (*Pinus* spp.) and quaking aspen (*Populus tremuloides* – FAC) and saturated, acidic peatland forests of black spruce (*Picea mariana* – FACW) and tamarack (*Larix laricina* – FACW) as well as open bogs and sedge meadows. These communities were impacted by intensive logging of white pine dating to the late 1800s. Today the oldest stands are 140- to 150-year-old second growth.

Canopy associates with white pine and red maple include yellow birch (*Betula alleghaniensis* – FAC), tamarack, black ash (*Fraxinus nigra* – FACW), northern red oak (Quercus rubra – FACU) and infrequently jack pine (*Pinus banksiana* – FACU) or red pine (*Pinus resinosa* – FACU). Saplings and seedlings of white pine are typically abundant in spite of high populations of white-tailed deer. Dominant tall shrubs include winterberry holly (*Ilex verticillata* – FACW), speckled alder (*Alnus incana* ssp. *rugosa* – FACW) and poison sumac (*Toxicodendron vernix* – OBL). Low shrubs include dwarf red raspberry (*Rubus pubescens* – FACW) and both low bush

Figure 6. Habitat view of a White pine – Red maple Swamp. Image courtesy Steve Eggers.

TABLE 3	
Indicator Rating	**Occurrence in Wetlands**
Obligate (OBL)	Almost always occur, under natural conditions, in wetlands
Facultative Wetland (FACW)	Usually occur in wetlands but occasionally occur in uplands
Facultative (FAC)	Equally likely to occur in wetlands and uplands
Facultative Upland (FACU)	Usually occur in uplands but occasionally occur in wetlands
Upland (UPL)	Almost always occur, under natural conditions, in uplands

blueberry (*Vaccinium angustifolium* – FACU) and velvet-leaf blueberry (*V. myrtilloides* – FACW). Cinnamon fern (*Osmunda cinnamomea* – FACW) is typically the dominant herb and can form an almost unbroken layer one meter or more in height. Other common herbaceous species are skunk cabbage (*Symplocarpus foetidus* – OBL), royal fern (*Osmunda regalis* var. *spectabilis* – OBL), gold-thread (*Coptis trifolia* – FACW) and sedges (*Carex* spp.). Two characteristic species of this community are disjuncts from the eastern United States: long sedge (*Carex folliculata* – OBL) and bog fern (*Parathelypteris simulate* – FACW). In Wisconsin, *C. folliculata* is only found in or near the borders of Glacial Lake Wisconsin (**Figure 8**).

Wildlife species include rare, uncommon or otherwise noteworthy species such as Northern goshawk, Red-shouldered hawk, four-toed salamander and three shrew species—water shrew, American pygmy shrew and Arctic shrew. Many northern bird species, some of which are at their southern range limits, nest in this community including Broad-winged Hawk, Northern Saw-whet Owl, Veery, Hermit Thrush, Red-breasted Nuthatch, Blue-headed Vireo, and Canada, Pine, Blackburnian and Black-throated Green Warblers. Game birds include Wild Turkey, Ruffed Grouse and American Woodcock.

A Regulatory Case Study: A proposed project that would have impacted a White Pine–Red Maple Swamp in Monroe County, Wisconsin was the subject of litigation that went all the way to the Wisconsin Supreme Court. In 2016, Meteor Timber proposed to fill 16.25 acres of this community to build a frac sand mining processing and rail loading facility. Initially the necessary wetland fill permits were issued with numerous conditions that included compensatory mitigation to offset adverse impacts. This was in spite of findings by the Wisconsin Department of Natural Resources (WDNR) that the proposed project would result in permanent and irreversible impacts to an exceptional quality, imperiled habitat. Clean Wisconsin and the Ho-Chunk Nation opposed the project and litigation ensued. In 2018, an Administrative Law Judge revoked the permit issued by the WDNR. Next, in 2021, a state appeals court upheld the lower court rulings that the WDNR violated the law when it issued the permit. Specifically, the WDNR lacked sufficient information to assess environmental impacts and improperly amended a permit that was granted in spite of numerous unanswered questions including whether mitigation could successfully offset the loss of this rare wetland resource. The case then went to the Wisconsin Supreme Court which, in 2022, declined to hear the case thereby denying the company's petition to reconsider the findings of lower courts.

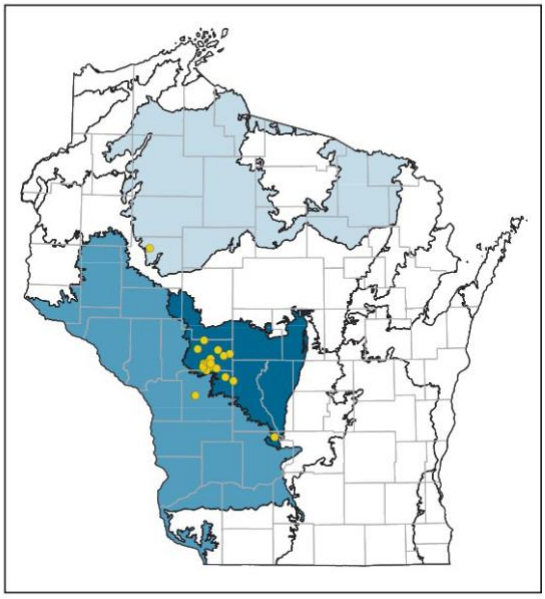


Figure 7. (left) Map from Wisconsin Department of Natural Resources. In the public domain.

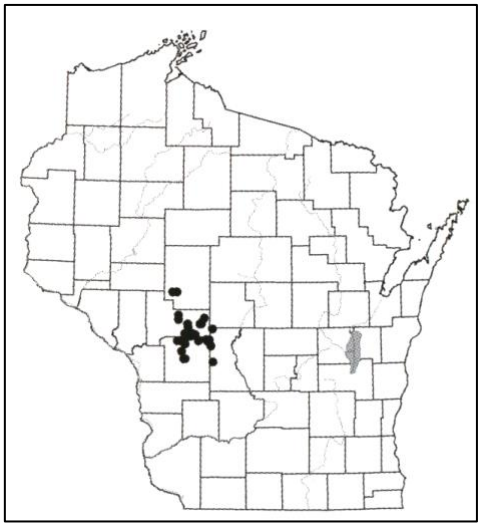


Figure 8. Distribution of Long Sedge (Carex folliculata) in Wisconsin (from Field Guide to Wisconsin Sedges by Hipp (2008)). Used with permission.

Minnesota Wildflowers Plant of the Month: *Potentilla hippiana*

by *Katy Chayka, MN Wildflowers (www.mnwildflowers.info)*

Family: Rosaceae (rose)
Common names: Wooly cinquefoil
Life cycle Perennial
Plant height: 4 to 20 inches
Bloom season: June-July
Habitat: Dry sandy or rocky soil; prairies, plains, meadows, forest, tundra

Figure 9. Potentilla hippiana. Photo by Katy Chayka taken in Polk County.

Plant description

Flowers: Branching cluster at the top of the stem. Flowers are yellow, about ½ inch diameter, with 5 broad petals that are tapered at the base and rounded, straight across, or slightly depressed at the tip. In the center are about 20 yellow stamens. The calyx cupping the flowers has 5 triangular to lance-shaped, sharply pointed sepals that are somewhat shorter than the petals. Behind each petal, alternating with the sepals, is a narrowly lance-elliptic bractlet shorter than the sepals. The calyx and flower stalks are covered in woolly hairs.

Leaves and stem: Leaves are mostly basal, pinnately compound with 7 to 13 leaflets, on stalks 1 to 4+ inches (1 to 10+ cm) long. Leaflets are oblong-elliptic in outline, ¾ to 2 inches (to 5 cm) long, the edges with a few to several large teeth or shallow lobes cut usually less than halfway to the midvein. The lowest leaflets are smallest, becoming larger as they ascend the stalk. The 1 to 3 stem leaves are much smaller, the uppermost stalkless or nearly so. The upper surface is gray-green with long, appressed, silky hairs; the lower surface silvery from dense woolly hairs. Stems are multiple from the base, erect to ascending to spreading, unbranched except in the flower clusters, covered in woolly hairs, and 2 to 4 times as long as the basal leaves.

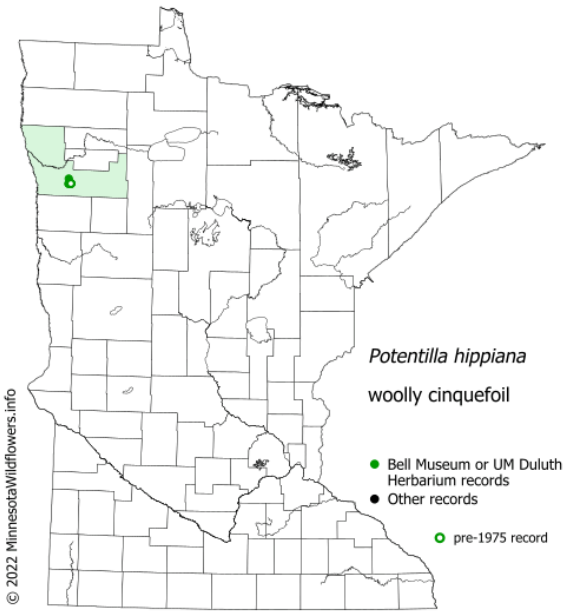


Figure 10. Minnesota county distribution map ©Minnesota Wildflowers Information.

Fruit: The sepals fold up, creating a capsule-like container, and eventually turn dark brown. Inside are many brown seeds, about 1.5 mm long. The old fruiting stems can persist through winter.

Notes

Potentilla hippiana is primarily a species of alpine meadows, mixed conifer forests, aspen stands and grassy slopes, common in the Rocky Mountains with scattered populations in the Great Plains. Minnesota sits on the eastern edge of its range and populations east of here are likely introduced. The flowers resemble those of other yellow-flowered *Potentilla* species, but the leaves are pretty distinctive and should not be confused with the others.

According to the DNR, the handful of state records are all from a small area in Polk County in dry, gravelly prairies. The first record dates back to 1900.

Figure 11. Photo by Katy Chayka taken in Polk County.

It was collected from the same location in 1937, then went undetected for nearly 80 years before it was found again in the mid-2010s on the gravel beach ridges of Glacial Lake Agassiz in the vicinity of past collections. Despite survey efforts in similar gravel beach ridges in the area, only two populations have been found, about 3 miles apart. In addition to the rarity of this species, its gravel prairie habitat is highly threatened by mining interests so it was added to the MN DNR Plant Watchlist in 2019 and will likely be considered for Endangered status during the next revision of the state's rare species list.

More images of wooly cinquefoil are available at:

https://www.minnesotawildflowers.info/flower/woolly-cinquefoil

Minnesota Wildflowers Website:
https://www.minnesotawildflowers.info

MINNESOTA NATIVE PLANT SOCIETY

Sphagnum Identification and Ecology Field Course

August 25 – 29, 2025

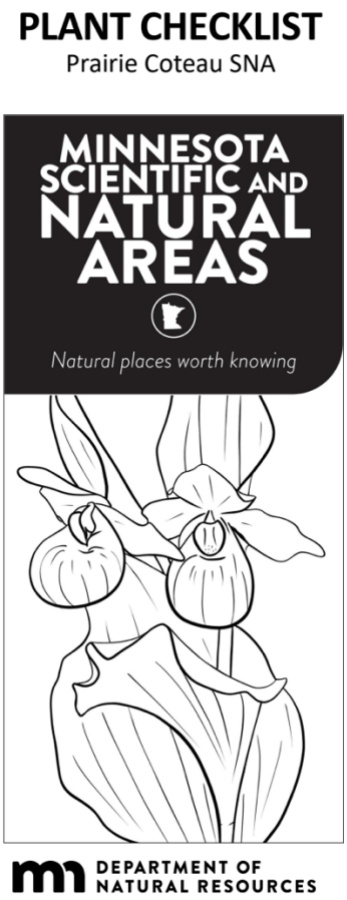
Registration: email mfeist@wisc.edu
Instructor: Jon Shaw (assisted by Mary Ann Feist & Keir Wefferling)
Location: Kemp Natural Resources Station, Oneida County, Wisconsin

The focus of this workshop hosted by the Botanical Club of Wisconsin is the identification of *Sphagnum* (peatmoss) species of northern Wisconsin in the field and under the microscope. Each day will include a presentation on aspects of Sphagnum biology, a field trip to see and collect species in nearby peatlands, and guided microscope work to observe anatomical characters critical to the identification of species. This Field Course will be held at Kemp Natural Resources Station, Oneida County, Wisconsin. Cost for the course is $550 for BCW Members and $600 for Non-Members. Registration cost includes instruction, meals, and shared lodging from 4:00 p.m. Monday August 25th to 1:00 p.m. Friday August 29th. A reduced rate ($275) for students is available (for up to four students). The course is limited to 15 participants.

SNA Plant Lists Have Been Updated

by Brian Johnson *(MNNPS co-editor)* and Kelly Randall *(Statewide Outreach Consultant, Scientific and Natural Areas Unit, MN DNR)*

Users of the DNR SNA website have probably noticed that the plant lists for Scientific and Natural Areas have a different look to them. Such lists were started in about 2005 shortly after the web pages for each site were produced in 2002. Originally based on data from the Minnesota Biological Survey, the lists were produced by SNA staff and others. Since at least some of the lists approached their twentieth year, a team was created to update them.



Species	Confidence
AQUATICS	
__ slender naiad (*Najas gracillima*)[SPC]	3
__ water smartweed (*Persicaria amphibia*)	1
CLIMBERS/VINES AND EPIPHYTES	
__ dwarf mistletoe (*Arceuthobium pusillum*)	3
__ wild honeysuckle (*Lonicera dioica*)	3
FERNS AND LYCOPHYTES	
__ prairie moonwort (*Botrychium campestre*)	1
__ northern ground-cedar (*Diphasiastrum complanatum*)	3
__ Goldie's woodfern (*Dryopteris goldieana*)[SPC]	3
__ field horsetail (*Equisetum arvense*)	3
__ smooth scouring rush (*Equisetum laevigatum*)	1
__ common scouring rush (*Equisetum praealtum*)	3
__ meadow horsetail (*Equisetum pratense*)	2
__ blackfoot quillwort (*Isoetes melanopoda*)[END]	3
FORBS	
__ common yarrow (*Achillea millefolium*)	2
__ rough false foxglove (*Agalinis aspera*)	3
__ roadside agrimony (*Agrimonia striata*)	2
__ prairie wild onion (*Allium stellatum*)	2
__ white wild onion (*Allium textile*)	2
__ common ragweed (*Ambrosia artemisiifolia*)	2
__ western ragweed (*Ambrosia psilostachya*)	2
__ small round-leaved orchis (*Amerorchis rotundifolia*)	3
__ hog peanut (*Amphicarpaea bracteata*)	3
__ canada anemone (*Anemone canadensis*)	1
__ long-headed thimbleweed (*Anemone cylindrica*)	2
__ pasqueflower (*Anemone patens*)	2
__ tall thimbleweed (*Anemone virginiana*)	1
__ field pussytoes (*Antennaria neglecta*)	2
__ plantain-leaved pussytoes (*Antennaria plantaginifolia*)	3
__ spreading dogbane (*Apocynum androsaemifolium*)	2
__ American hemp (*Apocynum cannabinum*)	2
__ clasping dogbane (*Apocynum sibiricum*)	3
__ hairy rock cress (*Arabis pycnocarpa*)	1

Figure 12. A portion of the new plant list for Prairie Coteau SNA.

The project team was composed of SNA staff members Kelly Randall, AmberBeth VanNingen, and Arika McGraw, and MBS members Michael Lee, Derek Anderson, Rhett Johnson and Bob Dunlap. Kelly Randall organized and facilitated the team's activities. The goals for the project were to make the plant lists accurate, easy to use, view and print, and employ current taxonomy. Further, the lists were to be data- and expert-driven with documentation of data sources. Finally, the lists were designed to be easier to update. To these ends, resource experts on invasive species, MNTaxa: The State of Minnesota Vascular Plant Checklist, and web implementation were also included as needed. The project began in March of 2023 and the updated lists were published in December of 2024. Going forward, the expectation is that these checklists will be updated on a regular basis.

A portion of a plant list in the new format is shown in **Figure 12**. Plants are sorted into different categories, including graminoids, forbs and ferns/lycophytes. Rare and introduced species are marked as such. The source of the data (vouchered specimen in an herbarium, an observation by DNR staff, or other) is indicated. The lists are laid out in such a way that a user can print the list and create a threefold pamphlet for use as a field checklist, if desired.

To update a particular plant list, the former plant checklist was used as the starting point. Additional data sources included iNaturalist, the Biodiversity Atlas, DNR contractors and Bioblitzes. The sources were compared, and missing species were added. This was an automated process developed by the co-managers of this project. Data are currently being quality-checked this year (feel free to help with that, Plant Society members!) and will likely result in additions as well as some species that will be removed in future checklists. Experts have already found locational information for some species that was incorrect. For example, some generalized location data show species on at least one SNA that experts know does not actually occur there. Those data points need to be refined. This process was based on the update to the SNA bird checklists, which was completed about a year earlier.

Early feedback on the new plant lists has been positive. The project team is interested in MN Native Plant Society members' feedback. If you wish to supply comments on the project or suggest additions or deletions to the plants lists, please email sna@dnr@state.mn.us to request access to a survey tool. A plant checklist can be found on each SNA's web page, or in one location at the URL: mndnr.gov/snas/plant-checklists.html.

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A Day with PlantWatch

by **Brian Johnson** ***(MNNPS co-editor)***

The vehicle convoy comes to a halt along the side of the highway. The PlantWatch team exits the vehicles and meets on a field approach to begin the morning's work. We are all looking forward to another new prairie to visit!

PlantWatch is a joint venture between the Minnesota DNR and the University of Minnesota Landscape Arboretum. Today we are in western Minnesota to search for *Astragalus flexuosus* var. *flexuosus* (slender milkvetch; **Figure 13**), a plant classified as Special Concern in Minnesota and associated with dry to mesic prairies.

Slender milkvetch is primarily a Great Plains species at the eastern edge of its range in Minnesota, where it is found primarily in three counties – Big Stone, Traverse, and Lac Qui Parle. These were among the first surveyed by the DNR Minnesota Biological Survey in the 1980's. Many of the sites have not been visited since, but some recent trips by the DNR to the area have indicated that this plant has become much less common.

Today's trip is part of a four-day excursion to examine many of the old sites, particularly those on private land. This work, supported by a LCCMR grant, will help the DNR evaluate and improve a Species Distribution Model that was created for slender milkvetch.

Using GIS and modelling software, the model will predict potential new locations for this species based on the characteristics of sites where the plant was recorded in the past. The DNR will use the new information to refine the model to increase its predictive accuracy. Since some sites are hundreds of acres but contain only 2-3 plants, the size of the PlantWatch team will help to increase the search efficiency and improve the model.

Figure 13. A. flexuosus var. flexuosus (pink flowers in center) with Astragalus lotiflorus in the upper right. Image courtesy Brian Johnson.

Our team includes Deanna Leigh of PlantWatch and Fred Harris of the DNR Minnesota Biological Survey. Fred quickly reviews the characteristics of the target plant with the group, and how it might be separated from some look-alikes, in this case young leadplant, vetches including *Lathyrus palustrus*, and other astragali, including *A. crassicarpus* (ground plum) *A. agrestis* (field milkvetch) and *A. adsurgens* (prairie milkvetch).

One volunteer logs into the Field Maps app we will use to count plants and does the initial login protocol for the group. There are ten of us today, so we split into two teams. One will explore the hill prairie to the south of a ravine, the other will go north, and we plan to meet somewhere in the middle. We are all reminded to turn on the Avenza app used to record our tracks, and away we go!

My group crosses a small field and begins to ascend the hill. We initially walk through an area covered in smooth brome (*Bromus inermis*) and wolfberry (*Symphoricarpus occidentalis*), a poor environment for our plant. As we continue ascending, we reach a level where there is a wider variety of native plants. We continue to work toward the ravine, and the diversity of the plants continues to improve. We note downy painted cup (*Castilleja sessiliflora*), stiffstem flax (*Linum rigidum*), toothed evening primrose (*Oenothera serrulata*) and green milkweed (*Asclepias viridiflora*), but no slender milkvetch.

We continue toward the ravine and encounter a steep gravelly slope. A particularly beautiful purple locoweed (*Oxytropis lambertii* var. *lambertii*) catches my eye, and I walk toward it to take a picture. Then the small purple-pink raceme of another plant catches my eye. I believe it is our target species and call Fred over for confirmation. He agrees, and more plants start appearing. We begin flagging them. We also note soft golden-rod (*Solidago mollis)* and western white prairie clover (*Dalea candida* var. *oligophylla)* nearby, two other state Special Concern species. A quality prairie, indeed!

We continue to notice more of our target plants. When it appears as though we've flagged them all, we count and record the gps coordinates of the plants on the Trail Maps app. We reach a total of about 60 plants. We move to the top of the bluff and observe a return to smooth brome and "buckbrush," the locals' name for wolfberry.

The other group appears in the distance. After meeting up, they also report a beautiful and diverse prairie but no additional target plants. We all return to the area of the bluff with an excellent view of the border lake (**Figure 14**) to enjoy our lunch. This is another opportunity to share the prairie flowers together and visit. The volunteers for the four-day event include natural resource professionals and amateur botanists, those in their twenties as well as those in their seventies, approximately equal numbers of men and women, and those from the Iron Range, the metro and St. Cloud areas, and some with ties to western Minnesota.

The weather was perfect for today's visit--the temperature was in the high sixties, a far cry from the previous day when it exceeded ninety degrees. And little did we know that the next day our final surveys would be completed in a drenching rain.

Since we have another set of sites to complete that day, we reluctantly leave the bluff and return to our vehicles. We all work together to complete the site checkout on the Field Maps app. This includes estimating the percentage of target plants that were flowering, the native grasses, forbs and woody species that were associated with it, a listing of any invasive species present, the type of management practices observed and other characteristics of the site. After all surveys are complete, DNR staff will use this information to describe the current population and update the Species Distribution Model. Initially it appears as though *Astragalus flexuosus* does well in pastures and appears to be disappearing from formerly grazed sites that have not seen any grazing in 30-40 years. In the meantime, we turn off our Avenza tracks, hop in our vehicles, and proceed to the next prairie!

Figure 14. PlantWatch team members compare notes in the Astragalus search area. Image courtesy Deanna Leigh.

Friend or Foe?

by Stephen Saupe *(MNNPS co-editor)*

"Who goes there: Friend or foe?"

This question is always on my mind when botanizing. Like the sentry at a gate who must distinguish a welcome visitor from an enemy, I am always assessing whether a particular plant is my friend or foe.

That's because I'm rather allergic to the resin, urushiol, found in poison ivy and its relatives. I am constantly on guard to distinguish these botanical enemies from my photosynthetic allies.

My main foe is western poison ivy (*Toxicodendron rydbergii*; **Figure 16**). Unfortunately, it extremely common throughout Minnesota. It grows in an amazing diversity of habitats (*i.e.,* mature hardwoods, prairies, disturbed areas) where a dermatology-challenged botanist might walk.

Despite its name, common poison ivy (*T. radicans* subsp. *negundo;* (**Figure 15**) is not nearly as abundant in Minnesota. It grows mainly in flood plain forests in the SE corner of the state and often grows as a vine that climbs by aerial roots that can give the stem a somewhat hairy appearance. I recently returned from a visit to see our relatives who live near Philadelphia and was awed, and horrified, by the size of some of the vines.

Poison sumac (*T. vernix*) also occurs in Minnesota, but is uncommon. Unless you hang out in swamps around the Twin Cities, you are unlikely to encounter these short-stature trees with compound leaves. Similarly, you needn't worry about poison oak (*T. diversilobum*). This foe doesn't grow east of the Rocky Mountains.

Perhaps the easiest way to recognize poison ivy is to remember the rhyme, "Leaflets three, let it be." Both western and common poison ivy have trifoliate leaves with the stalk of the middle leaflet being longer than the other two.

Figure 16. A formidable wall of Western poison ivy waiting for an unsuspecting botanist. Image courtesy Steve Saupe.

A number of botanical "friends" can be mistaken for poison ivy. These poison ivy lookalikes usually have trifoliate leaves. Welby Smith, in his outstanding book *Trees and Shrubs of Minnesota,* lists several including woodbine (*Parthenocissus inserta*), Jack-in-the-pulpit (*Arisaema triphyllum*), and trilliums (*Trillium* sp.).

Whenever my daughters and I go for a walk, I like to test their poison ivy identification skills by playing an informal game of "friend or foe?" I quiz them on their ability to recognize poison ivy, and especially like to try and trick them with some of the look-alikes.

Figure 15. Common poison ivy climbing a tree in SE MN. Image courtesy Steve Saupe.

In addition to the mimics that Welby mentions, there are many others. Hog peanut (*Amphicarpaea bracteata*; **Figure 17**) can be especially tricky because it frequently grows side-by-side with poison ivy. It's easy to recognize if you see its small, purplish papilionoid flowers. But since it is often not in flower, a more

Figure 17. Hog peanut. Image courtesy Steve Saupe.

reliable identification feature for hog peanut is that its leaflets have entire (smooth) margins, unlike the toothed margins of poison ivy.

Other friendly plants that, at times, can look a little, like poison ivy include wild strawberries (*Fragaria* sp.), several species of brambles (*Rubus* sp.), young box elder (*Acer negundo*) and green ash trees (*Fraxinus pensylvanica*), tick-trefoil (*Desmodium* sp.), honewort (*Cryptotaenia canadensis*), liverleaf (*Hepatica* sp.), black snakeroot (*Sanicula* sp.), wood anemone (*Anemone quinquefolia*), wild sarsaparilla (*Aralia nudicaulis*), and bladdernut (*Staphylea trifolia)*. There are a few other species also might be mistaken for poison ivy by the casual botanist, but are not likely to be encountered on a typical forest walk such as dwarf ginseng (*Panax trifolius*) and goldthread (*Coptis trifolia*).

Below is a poison ivy look-alike mini-quiz that my daughter Amy and I have created. Can you distinguish these friends from the foes?

(**Note**: Answers at end of newsletter. ***All images by Amy Saupe. Used with permission).***

A.

B.

C.

D.

E.

F.

Destination Botany: Lost Lake Peatland SNA

by **Brian Johnson** ***(MNNPS co-editor)***

This issue's Destination Botany features Lost Lake Peatland SNA, near Tower, Minnesota. And I was almost there! Continue reading for details.

Like many of the peatland SNAs, Lost Lake Peatland is challenging to access. In this particular case one can literally drive to and park on SNA land. However, getting into the peatland requires passing though the "moat" of willow and alder around much of the perimeter, where navigation and progress are challenging. An alternative to at least some of the difficult hiking may be to take a canoe or other watercraft from the boat landing on Lost Lake to the peatland. However, if it is done the reward is high—a ribbed fen, a featureless water track, and a raised bog occur here. As a result, this site is host to a number of rare plants including montane yellow-eyed grass (*Xyris montana*) and small green wood orchid (*Platanthera clavellata*). The plant list for the SNA features an additional six orchids.

My visit was part of an "orchid hike" on June 29th sponsored by the DNR SNA staff and advertised on the SNA events calendar. Approximately twenty of us met on a gravel road near the entrance to the SNA. Arika McGraw, a northeast region DNR naturalist, led the hike. She introduced herself and gave a brief background on this SNA. Given the inaccessibility of the SNA and the fact that it was advertised as a one-hour hike, she announced that we would probably not be entering the SNA proper but would be hiking on a snowmobile trail just outside it (see **Figure 18**) to get a feel for the experience.

Arika led the group from the road shoulder into the ditch. She took a couple of tentative steps though a very wet area and came up on a sphagnum mat which formed the basis for the snowmobile trail. Though we had been advised to wear high rubber boots, in some cases the first few steps were a doozy—water up and over the top and into the boots! Then we too were on the mat and ready to begin exploring. Arika turned us loose to explore on our own or to stay near her and get help with plant identification.

Figure 18. A view down the Arrowhead State Trail, primarily a snowmobile trail, where the hike occurred. Ultimately, it enters the SNA. Image courtesy Brian Johnson.

Arika pointed out a wild calla (*Calla palustris*) which was just completing its flowering. Someone spied a larger plant with a reddish-brown flower, which turned out to be marsh cinquefoil (*Potentilla palustris*). We quickly noticed that the longer one stood in one place, the deeper one sunk in the mat. For some, this was the impetus to move ahead faster. Others needed no such impetus to move ahead, as the hope of seeing something new drew them on. After about a hundred feet several of us noted some beautiful pink flowers. Closer investigation revealed them to be rose pogonia (*Pogonia ophioglossoides*). Soon we were all seeing them, ahead and off to the side. By the end of our hour, we probably saw a thousand.

We continued to move forward. Another type of pink flower became visible. Taller and with larger flowers, these were the tuberous grass pink (*Calopogon tuberosus* var. *tuberosus*). Once our eyes were properly trained, they stood out like beacons visible from more than fifty feet away. Then a real treasure – a hiker noticed a white one (**Fig. 19**).

Each few steps seemed to promise another new plant. Could we find

the small green wood orchid? Would we see any of the three species of sundew (*Drosera* sp.) reported to be in this SNA? Or would we run out of time before we could make any further discoveries? Unfortunately, Father Time won, as we were called back since four o'clock approached. As I neared the ditch and my reluctant departure from the sphagnum mat, it was my turn to have a careless step. One boot was submerged, but it felt good on a hot day.

The trip to Lost Lake Peatland delivered on its promise of adventure. The three o'clock start allowed those of us travelling from longer distances to depart from and return home at a reasonable time. It was fun to meet others interested in native plants and wild places. And, while it is rewarding and beneficial to remove invasives or gather seeds as is the goal of some other events on the DNR SNA calendar, it was enjoyable just to visit an SNA and see what it has to offer. Thanks to Arika and the DNR for making this possible.

Figure 19. A white tuberous grass pink. Image courtesy Brian Johnson.

Summary of the May Meeting Presentation: *Lessons Learned in Protecting and Restoring Biodiversity*

by **Bonnie Harper-Lore & Gary Lore**

(**Editor's Note**: The May program featured a presentation about their new book with contributions from 85 scientists, educators, practitioners, policymakers and citizen scientists. It was published Cambridge Scholars Press. It is intended for use as a textbook. The figures were printed in black and white to reduce cost. The book was released in paperback on June 10th and can be ordered from Cambridge Scholars Publishing for about $50. The following is a summary of chapters in the book.)

Each of the 10 Parts of this essay collection begins with an action word for a reason. Essays reveal why and how citizens, educators, scientists, practitioners, and policymakers solved many "crisis" issues at the local, state and national levels. Their words underscore that conservation work is not done alone but rather via networks and partnerships across jurisdictional lines in unique agreements, with new tools, and rulemaking. What continues to limit action appears to be public understanding and support. It is the reader's responsibility to build on what we learned and move the public

to become stewards of the land. No one does conservation work alone.

1. **Protecting Nature**: Since the 1970's, our natural heritage has been protected by law, preserves, inventory mapping and research. That accumulated natural history knowledge is now threatened by climate change. Nature-based solutions are being sought worldwide. But once biodiversity is diminished, ecosystem services are compromised and species lost, will we have the know-how to restore nature? Survival depends on it. Human and natural environments are forever connected (**Figure 20**).

2. **Connecting Plants and Animals**: Plants and wildlife have always needed one another to survive. Plant and wildlife sciences connect in the science of ecology which guides decision-making and research about their futures. These linkages are not always well understood or supported by the public or legislators. Action can be slow and species become extinct. Now and then one person ensures a specie's safe passage. Often, it takes a community or act of Congress.

3. **Restoring Native Plants**: As human-made disturbances increase so does the demand for native seed. Lack of availability continues to be an obstacle. After some 40 years of native seed growing successes, the horticulture industry largely ignores this business opportunity (**Figure 21**). Because of climate change pressures, federal land agencies are poised to both collect and grow ecoregional seed themselves and partner with industry in no-risk contracts.

4. **Understanding Restoration**: Although the United States has almost 100 years of restoration history, succeeding without unintended consequences continues to be a challenge. We continue to pioneer with rewilding too. As thousands of acres are restored, the process moves from an art to a science with increased diversity and function. Continued monitoring and managing over time will inform next levels of success, ultimately measured by human survival.

5. **Dealing With Invasive Plant Threats:** Invasive plant threats require more action: increasing public awareness, creating new control tools, stopping terrestrial and aquatics at our borders, and increasing support at the local, state and federal levels. Those are a lot of action words! Because invasives threaten agriculture, the environment, and human health, a rapid response strategy and cooperative efforts make for a front-line defense. A robust rapid response system is needed now. Dealing with minimal funding and lack of public awareness have slowed national successes.

6. **Managing Vegetation**: There is no silver bullet for protecting native plants and habitats from invasives on any given site. Training is critical to identifying both and eliminating only the invaders. We can no longer mow and spray weeds out of existence. Our toolbox remains limited while invasives continue to spread. They do not respect political boundaries so no single group can afford to eliminate their movement. Partnerships are imperative!

7. **Partnering**: Sharing strategies, tool, and crews at local, state. national and even international levels

Figure 20. (from Part One, Chapter 5) Kathy Bolin began searching for native seed in highway rights-of-way on behalf of DNR restoration needs in the 1980. One of her sources, the Shooting Star Prairie on Highway 56 became a Scientific and Natural Area.

Figure 21. (from Part Three, Chapter 29) Ron Bowen was one of the Midwest's pioneers in growing native species. Now his stores attract not only monarchs to Liatris sp., but customers as well.

requires both funding and coordination. Once again, the public and legislators need to understand this need. Sharing information among disciplines and stakeholders at all levels is essential. Pollinator loss has inspired and focused many cooperative efforts. They prove that together we accomplish more.

8. **Taking Action**: None of us wanted to become a "political animal". However, changing the way we protect and manage biodiversity on the ground can take generations of effort and lost time. This section explores how actions of one or more actions made a difference by lobbying, rulemaking, letter writing, coalition building and influencing legislators, brought about change. Sometimes rulemaking or regulation is the only way to change human behavior. And sometimes it is who you know that makes a difference.

9. **Ground-breaking Tools**: On-the-ground as well as electronic tools have advanced our ability to identify and inventory flora and fauna, map, rank and assess them, plus wash away invasive threats. Mexico leads with a big picture mapping view in their hope of protecting biodiversity and conservation usage. The next big step of combining North American databases would clarify priorities, cooperation and long-range planning on a continental level. Last year the TNC's Natureserve developed (with the help of big tech) a map of Biodiversity Importance, a map that should be the basis of all protection and restoration decision-making.

10. **Building on What We Learned**: Actions require multidisciplinary input. Author truths should spur the next generation's innovation, determination and hope for conservation and the greater good. Healing the earth of man-made scars requires responsible effort by the next generation as the climate changes, always with an eye for long-term consequences. Building on what we learned the hard way will save time and money, safeguarding the planet's health. Not only students and practitioners, but environmental advocates can build on what we learned.

MNTaxa Database Changes

by ***Derek Anderson, MN DNR***

These changes have been made to our (available online at: https://www.dnr.state.mn.us/eco/mbs/plant-lists.html). Many, but not all, have also been made to our rare features database (and Rare Species Guide).

Gentianaceae - Gentian Family			
Bartonia virginica	*Bartonia virginica*	yellow screwstem	
Centaurium pulchellum	*Centaurium pulchellum*	branching centaury	
Gentiana affinis	*Gentiana affinis*	northern gentian	
	Gentiana affinis var. affinis	pleated gentian	The only subtaxa known from Minnesota.
Gentiana andrewsii	*Gentiana andrewsii*	bottle gentian	
Gentiana andrewsii var. andrewsii	*Gentiana andrewsii var. andrewsii*	bottle gentian	
Gentiana andrewsii var. dakotica	*Gentiana andrewsii var. dakotica*	bottle gentian	
Gentiana flavida	*Gentiana flavida*	yellowish gentian	
Gentiana puberulenta	*Gentiana puberulenta*	downy gentian	
Gentiana rubricaulis	*Gentiana rubricaulis*	great lakes gentian	
Gentianella amarella	*Gentianella amarella*	northern gentian	
	Gentianella amarella subsp. acuta	marsh gentian	The only subtaxa known from Minnesota.
Gentianella quinquefolia	*Gentianella quinquefolia*	stiff gentian	
Gentianella quinquefolia var. occidentalis	*Gentianella quinquefolia subsp. occidentalis*	stiff gentian	
Gentianopsis crinita	*Gentianopsis crinita*	greater fringed gentian	
Gentianopsis procera	*Gentianopsis virgata*	lesser fringed gentian	
Halenia deflexa	*Halenia deflexa*	northern spurred gentian	
Apocynaceae - Milkweed or Dogbane Family			
Asclepiadaceae	Apocynaceae	Milkweed Family	Phylogenetic analysis supports including Asclepiadaceae (milkweed family) within the Apocynaceae
Apocynum androsaemifolium	*Apocynum androsaemifolium*	spreading dogbane	
Apocynum cannabinum s.s.	*Apocynum cannabinum s.l.*	American hemp	
Apocynum sibiricum	*Apocynum cannabinum s.l.*	American hemp	Now included within *A. cannabinum*.
Apocynum ×floribundum	*Apocynum ×floribundum*	intermediate dogbane	
Asclepias amplexicaulis	*Asclepias amplexicaulis*	clasping milkweed	
Asclepias exaltata	*Asclepias exaltata*	poke milkweed	
Asclepias hirtella	*Asclepias hirtella*	prairie milkweed	
Asclepias incarnata	*Asclepias incarnata*	swamp milkweed	
Asclepias incarnata var. incarnata	*Asclepias incarnata subsp. incarnata*	swamp milkweed	The only subtaxa known from Minnesota.
Asclepias lanuginosa	*Asclepias lanuginosa*	woolly milkweed	
Asclepias ovalifolia	*Asclepias ovalifolia*	oval-leaved milkweed	
Asclepias speciosa	*Asclepias speciosa*	showy milkweed	
Asclepias stenophylla	*Asclepias stenophylla*	narrow-leaved milkweed	
Asclepias sullivantii	*Asclepias sullivantii*	Sullivant's milkweed	
Asclepias syriaca	*Asclepias syriaca*	common milkweed	
Asclepias tuberosa	*Asclepias tuberosa*	butterflyweed	
Asclepias tuberosa var. interior	*Asclepias tuberosa subsp. interior*	butterflyweed	The only subtaxa known from Minnesota.
Asclepias verticillata	*Asclepias verticillata*	whorled milkweed	
Asclepias viridiflora	*Asclepias viridiflora*	green milkweed	
	Cynanchum laeve	honeyvine	Reported in FNA, but currently no specimen available to support evidence of it being in the state.
Vinca minor	*Vinca minor*	common periwinkle	
Vincetoxicum nigrum	*Vincetoxicum nigrum*	black swallow-wort	
Convolvulaceae - Morning glory Family		Morning Glory Family	
Calystegia macounii	*Calystegia macounii*	Macoun's false bindweed	
Calystegia sepium	*Calystegia sepium*	hedge bindweed	
	Calystegia sepium subsp. angulata	hedge bindweed	Work is needed on subtaxa.
	Calystegia sepium subsp. appalachiana	Appalachia false bindweed	Work is needed on subtaxa.
	Calystegia sepium subsp. sepium	hedge bindweed	Work is needed on subtaxa.
Calystegia spithamaea	*Calystegia spithamaea*	upright bindweed	
	Calystegia spithamaea subsp. spithamaea	upright bindweed	Work is needed on subtaxa.
	Calystegia spithamaea subsp. stans	upright bindweed	Work is needed on subtaxa.
	Cuscuta campestris	field dodder	Reported, more work needed on *Cuscuta*
Cuscuta cephalanthi	*Cuscuta cephalanthi*	buttonbush dodder	
Cuscuta coryli	*Cuscuta coryli*	hazel dodder	
Cuscuta glomerata	*Cuscuta glomerata*	rope dodder	
Cuscuta gronovii	*Cuscuta gronovii*	scaldweed	
	Cuscuta gronovii var. gronovii	swamp dodder	Work is needed on subtaxa.
	Cuscuta gronovii var. latiflora	swamp dodder	Syn: *Cuscuta saururi* (specimens verified by expert)
Cuscuta indecora	*Cuscuta indecora*	large-seed dodder	
Cuscuta pentagona	*Cuscuta pentagona*	bur clover dodder	
Cuscuta polygonorum	*Cuscuta polygonorum*	smartweed dodder	
Cuscuta megalocarpa	*Cuscuta umbrosa*	large-fruit dodder	
Ipomoea hederacea	*Ipomoea hederacea*	ivyleaf morning-glory	
Solanaceae - Nightsghade Family			
	Datura innoxia	angel's-trumpet	Noted, but no documented occurrences.
Datura stramonium	*Datura stramonium*	devil's apple	
Datura wrightii	*Datura wrightii*	angel's trumpet	
Leucophysalis grandiflora	*Leucophysalis grandiflora*	dwarf ground cherry	
Lycium barbarum	*Lycium barbarum*	matrimony vine	Noted, but no documented occurrences.
Nicandra physalodes	*Nicandra physalodes*	apple of Peru	Noted, but no documented occurrences.
	Petunia axillaris	large white petunia	Noted, but no documented occurrences.
Petunia ×hybrida	*Petunia ×atkinsiana*	garden petunia	
Physalis pubescens var. grisea	*Physalis grisea*	hairy ground cherry	Noted, but no documented occurrences.
Physalis heterophylla	*Physalis heterophylla*	clammy ground cherry	
	Physalis longifolia	longleaf groundcherry	Recently documented.
	Physalis longifolia var. longifolia	longleaf groundcherry	
	Physalis longifolia var. subglabrata	longleaf groundcherry	Recently documented.
Physalis virginiana	*Physalis virginiana*	Virginia ground cherry	
Solanum carolinense	*Solanum carolinense*	horse nettle	
	Solanum carolinense var. carolinense	Carolina horsenettle	The only subtaxa known from Minnesota.
Solanum dulcamara	*Solanum dulcamara*	bittersweet nightshade	
Solanum nigrum var. virginicum	*Solanum emulans*	black nightshade	Also syn: *Solanum ptycanthum*.
	Solanum nigrum	black nightshade	Solanum nigrum, as described in FNA, was probably introduced from northern Europe and has been locally naturalized in North America. Currently it is not known in Minnesota.
	Solanum nitidibaccatum	hairy nightshade	Noted, but no documented occurrences.
Solanum rostratum	*Solanum rostratum*	buffalo bur	
Solanum triflorum	*Solanum triflorum*	three-flowered nightshade	Noted, but no documented occurrences.

End Photos –Ragged fringed orchid (*Platanthera lacera*; left) and Small purple fringed orchid (*Platantherea psycodes*) observed at Sherburne National Wildlife Refuge (images submitted by Brian Johnson)

Poison Ivy Look-alike Quiz Answers (from p. 14). a) Bramble (*Rubus*); b) Wild strawberry; c) Honewort; d) tick-trefoil; e) Wild sarsaparilla; f) Bladdernut