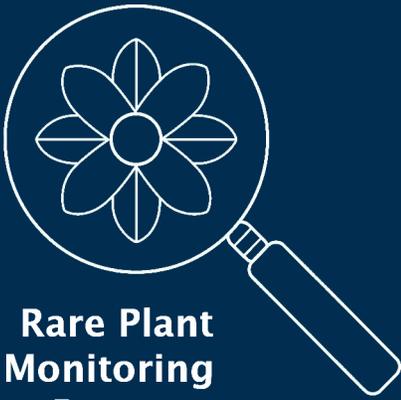


2021 Annual Report



Rare Plant
Monitoring
Program



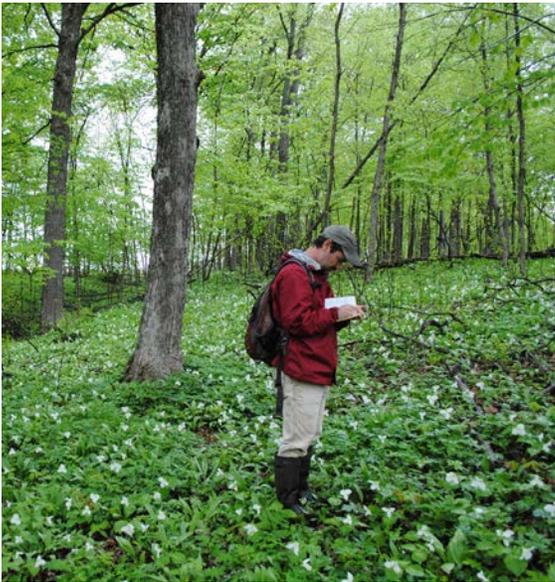


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This publication is available in alternative format (large print, Braille, audio tape, etc.) upon request. Please call 608-261-6449 for more information.
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State of Wisconsin Department of Natural Resources
 Box 7921
 Madison, WI 53707

Cover Photo Credit: Vanessa Brotske.

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Ann Stoda



Ben Redding



Chris Kirkpatrick

Thank You To Our 2021 Volunteers!

Maggy Adams
 Vicki Alldritt
 Derek Anderson
 David Barnes
 Robert Bearman
 Cindy Becker
 Ben Bomkamp
 Laura Bradshaw
 Vanessa Brotske
 Tara Buehler
 Heidi Conde
 Bob Costanza
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 Michaela Rosenthal
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 Michael Sinclair
 Jeffery Steele
 Ann Stoda
 Phil Sylla
 Nancy Thomas
 Lucas Turpin
 Amanda Weise
 Jane Whitney
 Arwyn Yarwood
 Mary Zaander
 Jim Zipple



Ann Stoda



Brenda Molano Flores

Escaping The Pandemic Through Nature



Ryan O'Connor

it can also be an anchor, something familiar and stable we can return to again and again. In some ways, I am surprised how reliable the influx of new people to the Rare Plant Monitoring Program (RPMP) is each year, but on the other hand, I've known all along that Wisconsin is full of people who love plants, so it's not at all surprising that they sign up to lend their botanical support.

In this annual report, you'll find stories about the 2021 field season, including an incredible orchid discovery in Door County and a rediscovery of a rare cliff fern population not seen in 90 years. You'll also find stories about how, increasingly, data from the RPMP is directly informing conservation action. It's an excellent example of the critical role citizen science plays in conservation of our most vulnerable species.

By Kevin Doyle
Rare Plant Monitoring
Program Coordinator



The last couple years have been a real rollercoaster. There is panic, then hope, then despair, then acceptance. Each reason for optimism

is tempered with a bit of caution. Between the time I write this and when you read it, I'm sure a few more emotional peaks and valleys will

have been traversed. Throughout, I've found that nature has been an important escape.

When I'm in the field doing plant surveys, it can be easier to forget the latest news. The pines, oaks and maples look the same as they did in 2019. There's no sign of the pandemic in the bog or the prairie. I'm guessing many people reading this have already found the same thing.

Botanizing can be a great escape, but

“BOTANIZING CAN BE A GREAT ESCAPE, BUT IT CAN ALSO BE AN ANCHOR, SOMETHING FAMILIAR AND STABLE WE CAN RETURN TO AGAIN AND AGAIN.”

You'll also hear from one program volunteer who is looking at seed viability of a rare prairie plant, prairie turnip (*Pedimelum esculentum*), and three other volunteers on their experiences in the program.

2021 was a great year for the Rare Plant Monitoring Program. Thank you for all the work you have

done for rare plant conservation in Wisconsin!

2021 Highlights

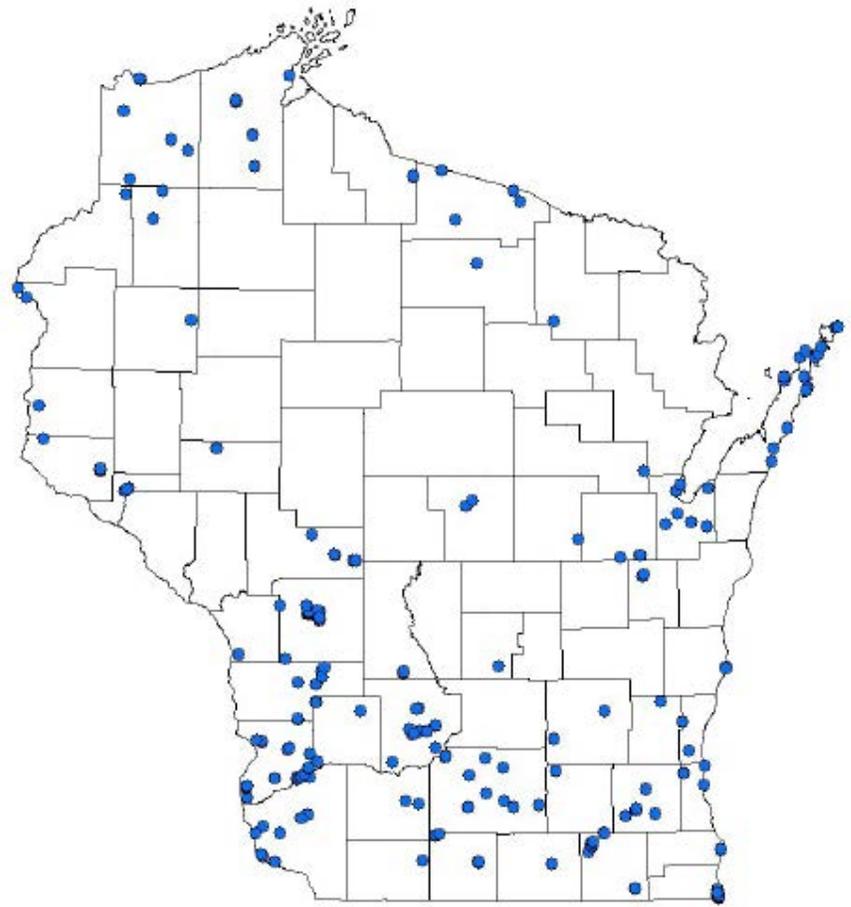
By Kevin Doyle
Rare Plant Monitoring
Program Coordinator

Each year brings more botanical highlights. For me personally, I saw six rare plants for the first time in 2021. The “life list” plants were a mix of wildflowers (*Boechera missouriensis*), shrubs (*Viburnum cassinoides*), ferns (*Botrychium* and *Sceptridium* species), sedges (*Eleocharis wolfii*) and even a parasitic plant (*Cuscuta coryli*). In many cases, these plants were found in habitats or parts of the states I haven’t spent much time in, making the experiences a little more special.

In 2021, the Rare Plant Monitoring Program had major highlights of its own. We brought on 57 new members, all who watched a series of online videos to complete their training. What a breeze trainings are these days! In total, volunteers submitted 258 rare plant reports, including discoveries of 35 new populations and 223 updates that provide important information for status assessments and future conservation action. Here are some of the many highlights from the 2021 season.

Shining Lady’s Tresses Discovered in Door County

Door County is an orchid hot spot in Wisconsin. Of our 48 native orchid species, 35 have been found in the northeast county, and there is a recent effort to document as many of them as possible. Jane Whitney



Top: Map of all rare plant reports submitted by RMPM volunteers in 2021. Bottom left: Orchid trekkers celebrate a big find, Wisconsin’s second known population of shining lady’s tresses (*Spiranthes lucida*; bottom right). Photo Credit: Jane Whitney.

Continued on page 6

is part of a trio of self-described “orchid trekkers,” which includes David Barnes and Julie Knox, all three RPMP volunteers. The three have been tasked with taking an inventory of all orchid species and individual populations within a Door County preserve using GPS.

“We have developed ‘orchid eyes,’” Whitney said, “and recognize many species of orchids, including their capsuled stalks, either up close and personal or from a distance. We’ve been doing this work for several years now and have found 28 species of orchids in this State Natural Area so far.”

In mid-June, Whitney was leading a group of hikers when they stopped

in a meadow to look at some wildflowers. That’s when she saw something unexpected: a lady’s tresses in bloom. There were plenty of lady’s tresses around Door County, but none flowered this early in the summer.

“Stopping mid-speech, I yelled to the hikers to stop in their tracks. I dropped to the ground to get a better look.”

Whitney told herself not to get too excited; it was probably just an oddball individual that decided to bloom early. She took a few quick photos with her phone, texted them to Julie and David, her fellow orchid trekkers, and continued the hike.

“David came up first with the possibility of shining lady’s tresses (*Spiranthes lucida*),” Whitney said, “because of bloom time and lip color. Julie searched her various resources and concurred with David. But there was only one known population in Wisconsin — how likely would it be that we would stumble upon only the second population in the state?”

Eventually, photos were sent to Kevin Doyle, botanist and RPMP coordinator, who confirmed the trekkers’ hopes. It was shining lady’s tresses, only the second population known in the state and the first in Door County. It was an amazing discovery and one these orchid hunters were uniquely positioned to find.



Door County Orchids

After reporting a new ram’s head lady’s slipper population in 2020, **Jesse Koyen** added another new orchid with his discovery of white adder’s mouth (*Malaxis monophyllos* var. *brachypoda*) in 2021. Meanwhile, **David Barnes** found a new population of giant rattlesnake plantain (*Goodyera oblongifolia*). Across eastern North America, orchids are declining for a variety of reasons, so it’s great to hear this good news.



More Data From Private Land

The RPMP prioritizes surveys on public land, but occasionally we will get reports from private land. Such was the case in 2021 when volunteers submitted reports on eight new rare plant populations found on private land. **Chris Kirkpatrick** submitted six while **Renee Gabrielse** found one on her own land. **Elizabeth Jesse**, **Ben Sandee**, and **George Rigg** made searching for rare plants a family affair. In July, while looking for purple milkweed (*Asclepias purpurascens*), they stumbled on a new population of great Indian-plantain (*Arnoglossum reniforme*) along a roadside in Richland County.



Family Hike Turns Into Rare Plant Survey

The most outstanding update we got this year was from the Baraboo Hills. **Ben Redding** took his kids on a hike to a state natural area where he had found some interesting rock walls on a previous visit. While poking around, he found maidenhair spleenwort (*Asplenium trichomanes*), a plant not reported from the site in 90 years! Redding said, “My fern book says that ‘You will likely only see it if you enjoy rock climbing on the most difficult routes.’ Showed them, I guess.”



Not Just Data Collection Anymore

2021 saw a number of examples of RPMP volunteers getting more closely involved in on-the-ground conservation. **Kathleen Garness** discovered a new population of prairie milkweed (*Asclepias sullivantii*) growing in a site dominated by brush. Garness contacted the property manager and got the OK to start clearing the site to improve habitat for the rare plants. **Tara Buehler** found a new population of wafer ash (*Ptelea trifoliata*) in Green Bay, then learned that future construction could impact the rare shrub. RPMP now working with the property manager to flag the plants so they can be avoided. **Chris Noll** relocated a population of small white lady's slipper (*Cypripedium candidum*) in Waukesha County not seen in 24 years. The fen where orchids call home had become degraded so Noll reached out to local property managers who met on the site, flagged the orchids and planned future management to improve the habitat.



Responsibility Species Gets More Surveys

Kitten tails (*Besseyia bullii*) is endemic to the Midwest, and Wisconsin likely has the largest, most secure populations anywhere. With this comes a responsibility to keep up to date on how these populations are doing and protect them as best we can. **Derek Anderson, Shannon Roznoski, Tom Ganfield** and **Joan Fritzler** took on this responsibility in 2021, submitting reports on seven kitten tails populations, which greatly improve our understanding of where they actually occur.



Up For A Challenge

James Riser has become a connoisseur of the Baraboo Hills since moving to Wisconsin a few years ago. In 2020, James found a population of rock clubmoss (*Huperzia porophila*) at one state natural area there, and he returned for more surveys in 2021. In total, Riser spent 13 hours over multiple days surveying for this rare fern, collecting excellent information (and photos!) of two populations not seen in 30 years. Rock clubmoss grows on cliff faces and although this habitat is common in the Baraboo Hills, it's not easy to survey, often requiring binoculars. On top of that, rock clubmoss may be hybridizing with the more common shining clubmoss (*Huperzia lucidula*), so accurate identification is difficult. Challenges like these mean that getting updates on these plants is left to only the most dedicated botanists like Riser.

Negative Updates

Unfortunately, there were 64 negative updates in 2021, meaning that the plants were searched for but not found. **Bob Costanza** searched for three populations of pale purple coneflower (*Echinacea pallida*) in Grant County, finding only one. **Amanda Weise** added to growing evidence that a population of the state endangered rough rattlesnake root (*Prenanthes aspera*) has disappeared from a prairie in St. Croix County. **Bethney Gunderson** and **Lucas Turpin** searched for a population of Hill's thistle (*Cirsium hillii*) where 100 plants were seen in 2006. Unfortunately, the site has apparently not been burned recently and no plants were found in 2021.



Back At The Fort

Doug and **Ann Stoda** were back at Fort McCoy in 2021, this time searching for the state threatened prairie parsley (*Polytaenia nuttallii*). The DNR knows of 44 populations of this plant, six of which are on the Fort. Unfortunately, only two of the six could be relocated due to habitat degradation since the early 1990s. Regardless, the Stodas' data on all six populations is a major improvement of our understanding of this species' status.



Paul Hlina

Rare Boreal Shrub

There are five populations of Canadian gooseberry (*Ribes oxycanthoides*) known in Wisconsin. In 2021, RPMP volunteers submitted information on two of them. **Bridget Olson** and **Anna DeMers** relocated plants in Barron County while **Paul Hlina** found some near the city of Superior. This rare gooseberry is distinguished from other more common species by the combination of its short flower/fruit stalks and copiously glandular leaves.



Debbie Konkel

Early Bloomers Get Attention

RPMP volunteers submitted seven reports of snow trillium (*Trillium nivale*), our earliest flowering rare plant. **Tara Buehler** relocated two populations in Brown County not seen in at least 25 years. **Emily Henrigillis** also visited a population she has been monitoring since 2018 while **Debbie Konkel** continued her work documenting the state's largest snow trillium population at a high quality site in Pierce County.



Dune Plants Get Some Love

Eric Howe was up and down the Lake Michigan coast again this year. In total, Howe submitted 18 reports of rare plants, including eight reports of seaside spurge (*Euphorbia polygonifolia*), an easily overlooked annual of open sand dunes. Howe submitted reports from Rock Island all the way down to the Illinois state line.



Rare Plants Underfoot

Nichole Good visited a prairie fame flower (*Phemeranthus rugospermus*) population in Waupaca County that hadn't been seen in 20 years. The tiny succulent plants were still there, hanging on in rock crevices, but the population has shrunk dramatically since 2000. Good noted that 76-100% of the population was threatened by a nearby trail, which may mean that trampling has caused the decline.



Rebecca Power

Dedicated Volunteers Scour Chiwaukee Prairie

While some volunteers travel around the state, other focus on their local preserve. Such is the case in Kenosha County where the RPMP volunteers at Chiwaukee Prairie State Natural Area were busy again this year. Together, **Rebecca Power**, **Eric Howe** and **Mark Lange** submitted 20 reports on the rare plants found in one of Wisconsin's premier state natural areas. Rebecca and Mark even tackled the difficult task of differentiating native (and rare), non-native and hybrid sea rockets (*Cakile* spp.).

Volunteer Report: Evaluating Reproductive Health Of A Rare Plant

By Lucas Turpin
Senior Biology Student
UW-Platteville

By Beth Frieders
Biology Professor
UW-Platteville



Editor's note: Lucas Turpin became an RPMP volunteer in 2019, focusing his efforts on the prairies of Dane and Iowa counties.

*He's also a student at UW-Platteville. With the help of Prof. Beth Frieders, Lucas developed a research project that takes a closer look at one of the threats possibly affecting prairie turnip (*Pediomelum esculentum*), a plant he surveyed as an RPMP volunteer. This is Lucas's report on that project.*

Pediomelum esculentum, commonly known as prairie turnip, is a rare legume found in dry gravel prairie remnants. Conservationists are concerned that a lack of genetic diversity within plant populations and decreasing cross-pollination between populations is causing a decrease in seed viability. Prairie turnip was selected as study species with the hope of informing conservation efforts. We hypothesized that small, degraded populations would have significantly lower seed viability rates



than large, healthy populations. By utilizing a chemical seed viability test, we were able to do a preliminary evaluation of this hypothesis.

We chose six populations to study, conducting population surveys during the growing season, marking plants and returning to collect seed when it was ready. Our evaluation focused on population size and habitat health – invasive species, woody invasion and plant diversity – as comparison factors.

Only four of the six populations studied produced any seed that we could find. The flowering plants we

Top: Large prairie turnip with ripe seed heads.

Upper right: One tray representing one prairie turnip site, the majority of which are viable.

Bottom right: Viable seed, completely stained red; to be viable, the radicle – first root – must be healthy.

Photo Credit: Lucas Turpin



Continued on page 10

found at the other two sites appeared to cease seed production early in the process, possibly due to drought stress. The other four sites were of varying population size and condition, from a population in the many hundreds in a diverse, well-managed natural area to a population of three plants in a highly degraded, unmanaged setting.

A percentage of seed was collected with permission of the owners, ensuring that the number of seeds collected was not detrimental to the population. Seed viability was chemically tested using tetrazolium, a salt that stains live tissue red, following a protocol written for testing agricultural seed. The seed was imbibed in moist towels to help break dormancy, nicked with a scalpel and placed in solution overnight. Each seed was bisected, observed under a microscope and

identified as viable or nonviable based on tetrazolium criteria.

The four tested sites produced compelling but inconclusive results.

The small, degraded site with a single fruiting plant produced two viable seeds of nine tested - below 30% viable. The other three sites - larger and on well-managed, diverse prairies - a viability rate of over 90% on more than 30 seeds tested per site. The small sample sizes of both the number of sites and number of

seeds tested per site prevent us from making any conclusions. Still, both physical observations - the seeds of the degraded site were shrunken by comparison - and the steep difference in viability rate suggest that an undetermined factor, such as population size or genetic diversity, could be affecting the plant's ability to reproduce at small, degraded sites.

“AN UNDETERMINED FACTO, SUCH AS POPULATION SIZE OR GENETIC DIVERSITY, COULD BE AFFECTING THE PLANT’S ABILITY TO REPRODUCE AT SMALL, DEGRADED SITES.”

With Lucas graduating this semester, Beth is looking to continue research in rare plant ecology. She is looking to incorporate other research components, like genetic sampling or tracking the impact of seed-feeding larvae. The tetrazolium protocol shows promise as a means of evaluating reproductive health; however, the logistical challenges of timing seed collection of hard-to-find plants at remote sites have led us to focus on a second rare dry prairie plant for continued present and future research. With improvements in the application of the seed testing protocol, this technique will hopefully serve as a means to continue to explore the health of these plant communities.

This research was made possible by generous grant funding from the Wisconsin Botanical Club and the Natural Resources Foundation and by the support of the UW-Platteville Biology Department.

2021 Species Of The Year Review

In 2021, the Species of the Year focused on 12 relatively common plants. As the DNR starts to review the list of rare species in 2022, the species at the fringes will get the closest scrutiny, and having the most up-to-date information in hand will be critical for making accurate assessments.

Including reports by non RPMP observers, 14 new populations of these 12 species were reported in

2021, along with 57 more updates. We received reports of six new putty root orchid populations, six new ovate beak grass populations, two new seaside crowfoot populations, and a new population of white camas and Braun's holly fern.

We also got updates on known populations of white camas, putty root orchid, dwarf milkweed, purple milkweed, brittle prickly pear, sweet colt's-foot, Braun's holly fern, algae-

leaved pondweed and hairy petunia. Lastly, we're working with Milwaukee County Parks to get updates on the populations of bluestem goldenrod on their properties.

While it's impossible to make a complete assessment of the status of these species only using data from 2021, here is a preliminary assessment of these 12 species.



Dwarf milkweed (*Asclepias ovalifolia*), Threatened

- Known populations: 97
- New populations discovered in last 10 years: 16
- Summary comments: A large percentage of dwarf milkweed populations have good or excellent viability based on population size and habitat quality. However, some observers have noted that fruit production is rare in the species, a problem reported in other milkweeds. Overall, dwarf milkweed seems to be doing quite well in large, actively managed barrens landscapes in central and northwest Wisconsin. Where habitat is more fragmented and/or not kept open, it is likely declining.
- **Consider downgrading to special concern**



Brittle prickly pear (*Opuntia fragilis*), Threatened

- Known populations: 47
- New populations discovered in last 10 years: 4
- Summary comments: Only eight of the 47 populations have good or excellent viability based on population size and habitat quality. The most viable populations appear limited to two geographic areas, making the species more vulnerable to single catastrophic events. Although the species should spread easily from broken-off pads, the low number of new populations that are discovered implies that there are other barriers to establishment. The species is likely still vulnerable in Wisconsin.
- **Species remains threatened**

Braun's holly fern (*Polystichum braunii*), Threatened

- Known populations: 50
- New populations discovered in last 10 years: 6
- Summary comments: Although few new populations have been found recently and most populations are small, Braun's holly fern occurs almost continuously across 30 miles of the Penokee Hills in northern Wisconsin, with scattered satellite populations in northeast Wisconsin. The particular habitat Braun's holly fern requires, cool ravines, may be vulnerable to extreme weather events like flash flooding or droughts, which are likely to increase with climate change.
- **Species remains threatened**

Bluestem goldenrod (*Solidago caesia*), Endangered

- Known populations: 36?
- New populations discovered in last 10 years: 0?
- Summary comments: Bluestem goldenrod is restricted to a two-county area in southeast Wisconsin. Species that are geographically clustered like this are more vulnerable to a single catastrophic event. The good news is that over a third of the known populations have good or excellent viability based on population size and habitat quality. Presuming too many of these sites haven't been overrun with invasive species, the high number of viable populations buffers the species from declines at any one site.
- **Consider downgrading to special concern**



Sweet colt's-foot (*Petasites sagittatus*), Threatened

- Known populations: 36
- New populations discovered in last 10 years: 2
- Summary comments: Sweet colt's-foot reaches the southern edge of its range in Wisconsin, where it is scattered across the northern tier of counties. Although it can be found in lower quality habitats like roadside ditches and utility corridors, new populations are rarely found. The biggest threat facing sweet colt's-foot is likely warming temperatures brought on by climate change.
- **Species remains threatened**

Seaside crowfoot (*Ranunculus cymbalaria*), Threatened

- Known populations: 36
- New populations discovered in last 10 years: 11
- Summary comments: Seaside crowfoot seems mostly limited to three well-developed parts of Wisconsin: Superior, Green Bay and Milwaukee. Within those areas, it is often found in wetlands along mowed roadsides that are salted in the winter. The species' preference for highly disturbed habitat and the increasing number of populations discovered each year suggest the species is stable in Wisconsin and probably not a high conservation priority.
- **Consider delisting**



Putty root orchid (*Aplectrum hyemale*), Special Concern

- Known populations: 73
- New populations discovered in last 10 years: 36
- Summary comments: Although most populations of putty root are small, the number of reports submitted each year implies there are many more of them than are currently documented, especially on private land in the Driftless Area. The species' wide geographic range in Wisconsin also buffers it from single catastrophic events.
- **Consider delisting**

Purple milkweed (*Asclepias purpurascens*), Endangered

- Known populations: 98
- New populations discovered in last 10 years: 21
- Summary comments: There are many purple milkweed populations in Wisconsin, and more are found each year. Most populations are small, though, and there are concerns about fruit production. Population viability may vary geographically, with those in the southeast, which were historically found in mesic prairies, seeing greater declines than those in the southwest, which occur in oak woodlands and may be more stable.
- **Consider downgrading to special concern**



Don Evans

Algae-leaved pondweed (*Potamogeton confervoides*), Threatened

- Known populations: 23
- New populations discovered in last 10 years: 3
- Summary comments: Algae-leaved pondweed's preferred habitat, acidic lakes, is particularly vulnerable to run-off and nutrient loading, which could increase with extreme rain events. Further, few new populations have been discovered despite extensive aquatic plant surveys conducted over the last 10-20 years. Although there are probably more populations to be found, this does appear to be a truly rare species with significant threats from climate change.
- **Species remains threatened**

Hairy wild petunia (*Ruellia humilis*), Endangered

- Known populations: 23
- New populations discovered in last 10 years: 5
- Summary comments: Hairy wild petunia is a dry prairie species, and like many prairie species, it is now limited to very small and isolated patches of habitat. Up to eight populations are found on sites that likely have received little to no management in decades. Although new populations will continue to be discovered, other populations have probably disappeared. With likely fewer than 20 populations left in Wisconsin and around five with good or excellent viability, hairy wild petunia should still be considered a high priority for conservation in Wisconsin.
- **Species remains endangered**



Don Evans

White camas (*Anticlea elegans*), Special Concern

- Known populations: 48
- New populations discovered in last 10 years: 29
- Summary comments: Although only 13 of the 48 populations have good or excellent viability, the number of reports submitted each year implies the species is clearly more common than the DNR database shows. Also, the species has a wide geographic and ecological range in Wisconsin, buffering it from the impact of any single event.
- **Consider delisting**

Ovate beak grass (*Diarrhena obovata*), Endangered

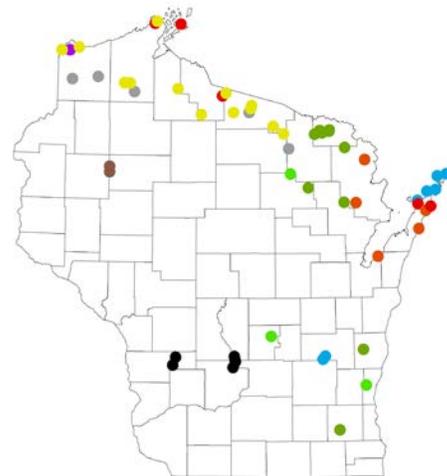
- Known populations: 21
- New populations discovered in last 10 years: 10
- Summary comments: Although a relatively small number of populations are known in the state, that number has almost doubled in the last 10 years. Further, over one third of populations have good or excellent viability based on population size and habitat quality. Ovate beak grass is a southern species moving north with warming winters. It still appears that may be uncommon in the state but not as rare as previously thought.
- **Consider downgrading status to special concern**

2022 Species Of The Year

The focus of the 2022 Species of the Year is climate change. Warming temperatures, more frequent extreme weather events like flooding and droughts, and the introduction of new invasive species are already affecting our plants and plant communities. While climate change has impacted all of Wisconsin in one way or another, some rare plants are more vulnerable than others. Those found in dry prairies well above the threat of flooding, for example, may be less impacted than plants already at the southern edge of their range and limited to cool, moist microclimates. These plants, the ones most vulnerable to the impacts of climate change, will be our focus this year.

- Cliff Cudweed
- Marsh Valerian
- Floating Marsh Marigold
- Northwestern Sticky Aster
- Giant Rattlesnake-plantain
- Rock Whitlow-grass
- Lesser Wintergreen
- Small Yellow Pond Lily
- Limestone Oak Fern
- Squashberry
- Linear-leaved Sundew

The plants we are focusing on this year fall into two categories: those at the southern edge of their range in Wisconsin and those found in a particularly vulnerable habitat. If you're up for a challenge, reach out to the RPMP program coordinator and request a survey. You can see from the map that they are scattered mainly in the northern and central parts of the state.



Found In Vulnerable Habitat



Dave Czoschke

Linear-leaved sundew (*Drosera linearis*)

Linear-leaved sundew is found in rich fens. These communities have a quaking mat and typical “bog” plants like leatherleaf, bog rosemary and pitcher plants but also plants limited to mineral-rich wetlands like bog buckbean, twig rush and shrubby cinquefoil. These rich fens depend on mineral-rich groundwater, which is likely to be impacted by higher temperatures and increased winter rain. Extreme flood events could also result in increased run-off and nutrient loading, resulting in an influx of invasive species like cattail. There are three priority populations of linear-leaved sundew in Wisconsin.



Wisconsin DNR

Cliff cudweed (*Pseudognaphalium saxicola*)

Cliff cudweed is one of two plants endemic to Wisconsin, meaning they are found nowhere else in the world. It can be found on cliffs near the Wisconsin and Kickapoo rivers. Whether moist or dry, these cliffs are exposed to extreme flooding events that have become more frequent, especially along the Kickapoo River, in recent years. Scouring from floods has the potential to wipe the cliffs clean of any vegetation. To make matters worse, as an annual, cliff cudweed doesn't have extensive roots that lodge into cliff crevices and hold it tight to the substrate. There are six priority populations of cliff cudweed in Wisconsin.



Suzan Campbell

Marsh valerian (*Valeriana uliginosa*)

Marsh valerian is one of two native valerians in Wisconsin. Both are rare and both are found in calcareous habitats. Marsh valerian, though, is more vulnerable, to the impacts of climate change because it's a more northern species. You can find it in the calcareous wetlands of eastern Wisconsin. Since these habitats depend on consistent inputs of mineral-rich groundwater, anything that could disrupt that such as drought, rain on frozen ground or increased temperatures, has the potential to threaten their integrity. On top of that, extreme flooding events can, at least temporarily, submerge populations, as has been seen recently in northern Wisconsin. There are 12 priority marsh valerian populations in Wisconsin.



Wisconsin DNR

Rock whitlow grass (*Draba arabisans*)

Although cliff communities are found throughout Wisconsin, rock whitlow grass is restricted to exposures of the Niagara Escarpment in Fond du Lac and Door counties. Some of these sites are shaded and cool, while others are more exposed and dry. The strong fidelity to this unique geologic feature is what makes rock whitlow grass vulnerable to climate change. Besides being geographically restricted, moist, cliffs in particular, are vulnerable to disruptions in groundwater flow, erosion or reductions in overhead canopy, all of which could change the microclimate around the unique flora. There are seven priority populations of rock whitlow grass in Wisconsin.



Wisconsin DNR

Squashberry (*Viburnum edule*)

Squashberry is doubly vulnerable in Wisconsin. First, it is a boreal species reaching the southern edge of its range in Wisconsin. Second, it is limited to a very small area in Barron County and within that area is only found in a very particular plant community called a felsenameer. This community is called a climate relict because the cold air that drains from the base of the rocky slopes provides suitable habitat for species that would have otherwise retreated from Wisconsin with the glaciers. There are two priority populations of squashberry in Wisconsin.

Edge of Range Species



Wisconsin DNR

Giant rattlesnake plantain (*Goodyera oblongifolia*)

Giant rattlesnake plantain is a boreal species found in northern upland forests. Unlike many of our native orchids, it can be identified even if it's not in flower by its distinctive basal leaves that only have the midrib whitened (all other rattlesnake plantains have a network of white veins on a green background). Giant rattlesnake plantain is scattered across northern Wisconsin, and multiple new populations have been discovered in the last few years. Although the forests this orchid is found in are not rare, they will change as species composition changes and other stressors like forest pests, invasive species and deer browsing increase. There are five priority populations in Wisconsin.



Wisconsin DNR

Small yellow pond lily (*Nuphar microphylla*)

Small yellow pond lily is a boreal species that reaches the southern edge of its range in northern Wisconsin, where it's found in lakes, spring-fed ponds and quiet bays. The impact of climate change on aquatic systems is less clear, and the fact that small yellow pond lily is found in a variety of waterbody types may provide some buffer. Still it's possible warming temperatures will be enough to drive it out of Wisconsin. There are 13 priority populations in Wisconsin.



Wisconsin DNR

Lesser wintergreen (*Pyrola minor*)

Lesser wintergreen is a boreal species that extends south to the northern tier of Wisconsin counties. There, it is found in cool, wet cedar swamps. These forests are highly vulnerable to climate change for a number of reasons. White cedar is expected to decline by the end of the century. If precipitation becomes more variable or more rain falls on frozen ground and quickly runs off before infiltrating the ground, the supply of mineral-rich groundwater that feeds the swamp may be impacted. Perhaps a bit of good news, the short style of lesser wintergreen, which makes it unique among look-alikes, may indicate that the species can be self-pollinated, a trait that would make it more resilient to climate change impacts. There are five priority populations in Wisconsin.



Scott Namestnik

Northwestern sticky aster (*Canadanthus modestus*)

Northwestern sticky aster has only been found once in Wisconsin, in the far northwest corner of the state near the city of Superior. Since it was discovered in 2008, no follow-up reports have been submitted to the DNR, so its status is currently unknown. As a boreal species that barely extends into Wisconsin, it is obviously vulnerable to warming temperatures. Already at the edge of its climate envelope, it could be pushed over the limit as it gets hotter. There is one priority population in Wisconsin.



Mary Ann Feist

Limestone oak fern (*Gymnocarpium robertianum*)

Limestone oak fern has been found scattered around the state, but since the mid-1980s it has only been seen in the northeast, perhaps indicating a range contraction due to the warming climate. The more recent observations have been made in cedar swamps, a wetland threatened first by disruptions to constant input of mineral-rich groundwater and second by warming temperatures, pushing its characteristic species northward. There are five priority populations in Wisconsin.

Meet Your Rare Plant Monitors



Tom Ganfield joined in 2017 and focuses on the southern Kettle Moraine area in Walworth County but has been expanding his searches into Rock County.



Tara Buehler joined in 2020 but has covered an incredibly wide swath of Wisconsin since then, stretching from Dane County all the way up to northern Door.



2021 was Ben Redding's first year with the RPMP, but he was really active, submitting 15 reports, mainly from the Baraboo Hills.

Meet three RPMP volunteers who have been particularly active in recent years.

What has been your most rewarding rare plant survey?

Ganfield: The hill prairie/savanna that sparked my interest to sign up with the Rare Plant Monitoring Program is my favorite site. As a volunteer helping to restore state natural areas within the southern Kettle Moraine region, I became fascinated with a small site close to home. I learned about the site's history, its restoration practices and plant assemblages. I saw my first kitten tail (*Besseyia bullii*) there, which prompted me to join the RPMP. I wanted to provide the DNR with as much information as possible to properly manage this site. With regular prescribed burns and removal of invasive, non-native plants, I have witnessed a doubling of the kitten tail population to more than 70 in just a few years. Restoration works!

Buehler: The most rewarding plant survey I have done in terms of prestige was definitely where I

located one eastern prairie fringed orchid (*Platanthera leucophaea*) at a site near Oshkosh for the first time in six years. Every plant survey is like a mini adventure. Going to a new place and seeing new things is a great reward every time.

Redding: My favorite plant survey so far didn't even start as a plant survey. I was just out exploring with my kids on a weekend with no real agenda when we found a small population of maidenhair spleenwort (*Asplenium trichomanes*). I figured we had simply chanced upon a record that I wasn't aware of, but it turned out that it hadn't been reported in that area since the early 1930s! That was exciting to learn about, and having my kids involved in the process made it extra fun.

What do you think are the most pressing issues affecting rare plants right now?

Ganfield: I believe the lack of proper management and inattentive development threaten rare plant populations. Rare plants are rare due

to numerous factors, and the lack of management can adversely affect populations by letting non-native, invasive plants alter plant community and soil characteristics. Also, since rare plants occupy limited habitats, any loss of natural areas with diverse flora and fauna assemblages is a worrisome blow to sustaining rare plant populations.

Buehler: I think site degradation and loss are the most pressing problems for rare plants right now. Many of these plants require very specific habitats, and if that is lost to development it would be very hard, if not impossible, to recreate.

Redding: Habitat loss. Looking for different rare plants and realizing how niche many of their habitat requirements are has been eye opening. For example, all of the maidenhair spleenworts I mentioned earlier were growing out of one long crack in a big rock wall full of many

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other similar-looking cracks. This rock wall is just one of perhaps hundreds of rock walls at this site, and I have probably looked at most of them now and have yet to find anymore *Asplenium*. Furthermore, there are lots of sites around this place with similar conditions, and I've checked most of those out too. Nothing to be found! What is so special about that one crack?? This underscores to me the importance of habitat preservation — we need to keep working to preserve not only lots of land area but a diversity of land types as well.

What is the hardest thing about a rare plant survey?

Ganfield: I love to learn about new plants. When I visit a site for the first time and cannot find the rare plant, especially if it's one I have not seen before, I question my tracking abilities. Am I using GPS correctly? Do I know how to spot the plant vegetatively? Is the plant no longer present? Sometimes, if I revisit the site the next year and find the plant, I'll marvel at its tenacity and my spirit is buoyed.

Buehler: The hardest part for me is initially finding a target plant at a site, especially if I haven't seen that species before.

Redding: Leaving after you don't find something! Even harder — going back to look for it again!

How do you prefer to submit data? iNaturalist? Survey123? Hard copy forms? Why?

Ganfield: I use Survey123 for its simplicity and similarity to the hard copy form. I collect field notes on my phone then enter them through Survey123.

Buehler: Survey123 because it is easiest to submit my modified pictures (maps, pictures with arrows and circles, etc.) with a phone. However, I have not tried doing so through iNaturalist yet. The frustrating parts of using Survey123 are losing your information if you accidentally exit the window (I have learned to type it in my notes app first) and the character limits.

Redding: I really have come to like iNaturalist since becoming a volunteer. I've learned a ton from using it, and when you find a rare plant, it's easy to submit it to the RPMP project.

How has the pandemic affected your rare plant surveys?

Ganfield: With indoor restrictions and the cancellation of many outdoor activities, I found the freedom of surveying plants refreshing. I increased the number of surveys to scratch my outdoor itch.

Buehler: Well, I initially volunteered the winter of 2019/2020 doing state natural area habitat work, which was all group work. The pandemic canceled all group work, so it kickstarted me into doing these surveys more often because they are more individually oriented.

Redding: Like many people, I had some big empty blocks of time on my hands during the pandemic without much else to do other than go outside, so it has allowed me to do more plant surveys than I would have had time for normally.



Kitten tails (left), maidenhair spleenwort (upper right), and prairie fringed orchid (bottom right) brought volunteers some of their favorite memories.



Field Notes



Ben Bomkamp and **Kerstyn Perrett** are “high volume” rare plant monitors, submitting many reports from around the state each year. In 2021, they submitted reports on three separate rare orchids, including Great Plain’s lady’s tresses (*Spiranthes magnicamporum*).
#naturespipecleaner



In 2020, Kevin Doyle found two new rare plant populations on a dry prairie remnant near Mazomanie. **Lauren Nichols** revisited the sites in 2021 and found that the purple stem cliff brake (*Pellaea atropurpurea*) population was eight times bigger than Doyle thought! Her photos show the diagnostic hairs along the rachis. #checkyourbrakes



Zach Kron kicked off the rare plant season with his discovery of a new Kentucky coffee tree (*Gymnocladus dioica*) population in Dodge County. The cold weather is great time to learn tree identification. Traits like leaf scar shape are much more dependable than leaf shape.
#nothingstartsbeforecoffee



Heidi Conde scoured the sandy terraces along the Chippewa River for brittle prickly pear (*Opuntia fragilis*), one of our 2021 Species of the Year. She braved thick patches of poison ivy to find two large populations of the cactus. Conde also noted multiple stressors threatening the populations, excellent information to have and pass on to property managers. #smallplantorbigkey



Mary Ann Feist was back in the Driftless Area this summer, visiting with her beloved carrot family plants like hairy meadow parsnip (*Thalictrum chapmanii*). She also made it to the algific talus slopes, though, where she reported on the federally threatened northern monkshood (*Aconitum noveboracense*), a poisonous member of the buttercup family.
#lessonsfromginnyandgeorgia



In June, **Michael Sinclair** used a rare plant survey to explore a part of the Chequamegon-Nicolet National Forest that he’d never been to. Along with pitcher plants, bog rosemaries and a bed of sphagnum moss, Sinclair relocated Russet cotton grass (*Eriophorum russeolum*), the rarest of our cotton grasses.
#naturesqtip



Mary Zaander has been monitoring a population of dwarf milkweed (*Asclepias ovalifolia*) since 2019. At that time there were 130 plants, including five in fruit, which is actually high for this species. Unfortunately, the population has been dwindling since 2019 and Zaander had noted brush closing in. Using flags to get an accurate count, she found only 49 plants in 2021 and noted that those under hazel were less vigorous than those in the open. [#burnittosaveit](#)



Alex Graeff surveyed a population of sweet colt's-foot (*Petasites sagittatus*) in northern Vilas County, not too far from the Upper Peninsula. From above, the leaves can look like those of big-leaved aster (*Eurybia macrophylla*) or lion's foot (*Prenanthes alba*). It's the white underside of the colt's-foot leaf that makes the difference. Graeff's photo of the diagnostic trait is a great example of what should be included with rare plant reports. [#picsoritdidnthappen](#)



Phil Sylla revisited a known population of clustered bur reed (*Sparganium glomeratum*) in Washburn County where the state threatened plant had been transplanted to avoid highway construction in the mid-1990s. Cattail was dominant in the area, but Sylla did find some bur reeds, just not the right kind. But because Sylla took photos of key plant features like the fruit beaks, identification was much easier. Still, Sylla's survey provides evidence that transplanting rare species out of harm's way doesn't always work and emphasizes the importance of protecting plants *in situ*. [#saferathome](#)



Shannon Roznoski worked with stewards at The Prairie Enthusiasts to better document some of the rare plant populations on their sites. Together, it's a great example of the many conservation services volunteers provide. Roznoski documented one of the earliest blooming prairie rarities, prairie false dandelion (*Nothocalais cuspidata*). [#fullservice](#)



Of the nine known populations of mullein foxglove (*Dasistoma macrophylla*), five have been discovered in the last 15 years, and **Roberta Herschleb** has surveyed two of them. It's a southern species that could become more frequent in Wisconsin. Having someone who is familiar with it will really help find any new populations. [#slylikeafoxglove](#)



Robert Bearman visited a lake in Forest County looking for the rare Torrey's bulrush (*Schoenoplectus torreyi*). Amongst the pipeworts, he found a dense population of the special concern plant along the shore of the sandy-bottomed lake. [#paddleforplants](#)



Nancy Thomas went to a favorite orchid viewing spot in Douglas County last summer. When she found some yellow lady's slippers, she checked her wildflower book and realized the small flowered variety (*Cypripedium parviflorum* var. *makasin*) was listed as special concern. #readingisfundamental



Jacob Friend was botanizing around Milwaukee in 2021 and found three rare plants, including the Midwest endemic forked aster (*Eurybia furcata*). The good news is that he found more plants than were seen in the last visit. The bad news is that "buckthorn is rather aggressive in the area." #rareplantsneedafriend



Heidi Hankley continued her work on the dry-mesic prairies of Green County where she also does habitat management. Hankley found an interesting ragwort (*Packera* sp.) and sent photos of the plant next to a ruler so it could be identified. Again, these kinds of photos are critical for confident and accurate identification and ensuring that we only document the truly rare plants. Thanks to Hankley, we can confidently say this ragwort was not the rare one. #canigetarulingonthisplant



Joanne Kline was in northern Door County searching for a rare and tiny mustard, rock whitlow grass (*Draba arabisans*). The plant is restricted to the dolomite cliffs of the Niagara Escarpment, which in Joanne's case meant hiking along the shore of Lake Michigan. #officewithaview

