Minnesota Plant Press

The Minnesota Native Plant Society Newsletter

www.mnnps.org

Volume 32 Number 2 **Spring/Summer 2013**

Where has the Plant Press Been?

Earlier this year, Gerry Drewry, after years of exemplary work editing the *Minnesota Plant Press*, decided to step down and hand the responsibility of editing the Plant Press to a new editor. The MNNPS Board accepted my offer to take over editing the *Plant Press*. While I had hoped for a seamless transition from Gerry's work, I instead stumbled badly in taking over this important responsibility, with the result that the *Plant Press* is several months late in getting to you. You have my promise that I will correct this, and that you will still receive four issues of the *Plant Press* this year. Please accept my sincere apology for the delay in getting the *Plant Press* to you.

-Daniel W. Jones, *Minnesota Plant Press* editor

Monthly meetings

Thompson Park Center/
Dakota Lodge
Thompson County Park
1200 Stassen Lane
West St. Paul, MN 55118

Programs

The Minnesota Native Plant Society meets the first Thursday in October, November, December, February, March, April, May, and June. Check at www.mnnps.org for more program information.

Ecophysiology of Forest Wildflowers

by Stephen G. Saupe, Biology Department, College of St. Benedict/St. John's University This is a summary of his presentation at the February 7, 2012 Minnesota Native Plant Society meeting.

Consider round-lobed hepatica (*Anemone americana*) and zig-zag goldenrod (*Solidago flexicaulis*). In central Minnesota the peak bloom period for round-lobed hepatica is the first week of May, while for zig-zag goldenrod it is the first week of September. As a consequence, even though these forbs grow in the same forest they must contend with radically-different conditions.

Spring-flowering forbs, like round-lobed hepatica, that bloom before canopy closure have at least 20 times more light available for photosynthesis than the summer-flowering forbs like zig-zag goldenrod. Similarly, spring-forbs also have a greater and more predictable water supply and they must deal with cooler temperatures and more wind than summer-forbs. In response, the spring- and summer-forbs employ different ecophysiological survival strategies.

The availability of light is arguably the most important factor. The shady and drier conditions on the forest floor in the summer make it an especially challenging place to make a living. This explains, in part, why the frequency of angiosperms that bloom in a Minnesota forest is greatest in May and then steadily declines throughout the growing season.

Considering the limited availability of light, it's not too surprising that summer-forbs typically photosynthesize at about half the rate of spring-forbs. However, they are much more efficient at using the light they do get. For example, summer-forbs have a lower light saturation point, which refers to the amount of light at which a plant reaches its maximum photosynthetic rate. This means that a summer-forb needs less considerably light than a spring-forb to accomplish the same amount of photosynthesis.

Acting like a large television antenna to help harvest the limited light in shady woodlands, leaves of summer-forbs typically have a larger surface area and are packed with

Continued on page 3

In this issue

Taxonomy notes

Gender and Words, with a Humorous Example

By Shirley Mah Kooyman

In a past issue of the *Plant Press*, I wrote about gender and plant names particularly as related to trees. Here is a quick refresher on botanical Latin. The genus is a noun and the specific epithet is an adjective. Except for some exceptions the genus and specific epithet match in gender. As in Latin, the general rule is: male = "us", neuter = "um", female = "a" (Examples: *Helianthus tuberosus, Chenopodium album, Dicentra cucullaria*). Many foreign languages have the relationship of gender and words. In the English language such a relationship doesn't exist so it's difficult for English speakers to understand that. A number of years ago I received an e-mail with a funny example of a word in Spanish and the question of whether it should be masculine or feminine. I have since lost the name of the author so I can't give that person credit for the following humorous example. I hope when you read this you don't take offense and think that I'm being a sexist.

Here is the story as I had received it. A Spanish teacher was explaining to her class that in Spanish, unlike English, nouns are designated as either masculine or feminine. "House" for instance, is feminine: "la casa". "Pencil", however, is masculine: "el lapis".

A student asked, "What gender is 'computer'?" Instead of giving the answer, the teacher split the class into two groups, male and female, and asked them to decide for themselves whether "computer" should be a masculine or a feminine noun. Each group was asked to give four reasons for its recommendation.

The men's group decided that "computer" should definitely be of the feminine gender "la computadora", because:

1. No one but their creator understands their internal logic.

2. The native language they use to communicate with other computers is incomprehensible to everyone else.

3. Even the smallest mistakes are stored in long term memory for possible later retrieval.

4. And as soon as you make a commitment to one, you find yourself spending half your paycheck on accessories for it.

The women's group, however, concluded that computers should be masculine "el computador", because:

1. In order to do anything with them, you have to turn them on.

2. They have a lot of data but still can't think for themselves.

3. They are supposed to help you solve problems, but half the time they are the problem.

4. And as soon as you commit to one, you realize that if you had waited a little longer, you could have gotten a better model.

So it seems the women have won in this case since in Spanish it is "el computador".

Treasurers' report

On June 30, 2013, the Society had $27,997.47 in assets. This included $18,929.74 in the checking account, $9,012.73 in CDs, and $55 cash. From Jan. 1 through June 30, income totaled $8,008.20; expenses were $5,814.14, for a net gain of $2,194.06. Dues totaled $2,887.00. Symposium income was $4,055.00; its expenses were $4,613.82.

A more comprehensive Treasurer's report will be provided in the next issue of the Plant Press.

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Ecophysiology of Wildflowers

Continued from page 1

more chlorophyll than the leaves of spring-forbs. In an attempt to outcompete their neighbors for the limited light, the summer-forbs are normally taller and less branched than the spring-forbs. Being short has an added advantage for the spring-forbs; it is warmer next to the soil surface which is a bonus in the springtime.

In forests with relatively uniform conditions throughout the growing season such as a rain forest, the leaves of forbs and trees are similar. However, in our forests the leaves of the forbs are more commonly dissected and compound while those of trees are simple. The advantage of dividing leaves into sections is that it breaks up the leaf boundary layer which increases carbon dioxide uptake for photosynthesis. The drawback is that it results in higher rates of water loss. Presumably for the trees, the advantage of increased photosynthesis with compound leaves is trumped by the loss of water. Since water is generally more abundant during the spring, we hypothesized that spring-forbs would have a greater frequency of compound and dissected leaves than the summer-forbs. Though this trend exists in central Minnesota forests, it is not statistically significant.

Spring-forbs live their life in a hurry. Or, as the old expression goes, they need to "make hay while the sun shines." Spring-forbs must complete their life cycles before the canopy closes and they go on a light "diet." Thus, these plants have a shorter bloom time than summer-forbs. And since the spring-forbs have more light available and ultimately more resources to invest in growth, spring-forbs grow more rapidly and develop more synchronously than summer-forbs.

Round-leaved hepatica (*Anemone americana*).
Photo by Christopher Noll, courtesy University of Wisconsin-Stevens Point

Spring-forbs are typically perennials that arise from a bulb, corm or tuber. There simply isn't enough time for most annuals to complete their life cycle between when the soil is warm enough for seed germination and canopy closure. Cold is an important signal to help 'tell' the perennial spring-forbs when to break dormancy and begin growing. In fact, the more cold they get, the quicker spring-forbs emerge and the larger many will grow. Similarly, a cold treatment of the plant is usually necessary to trigger flowering. Called vernalization, it insures that the plants bloom soon after emerging. Some plants, such as *Hydrophyllum virginianum*, even respond to the amount of cold they receive; the more cold it gets the shorter the time to flowering. A long cold-treatment suggests to the plant that there was a long winter and that there will be a short growing season before canopy closure. They don't have much time to 'git er done.'

The cooler, unpredictable weather in the springtime means that pollinators, and the days on which a pollinator can fly, are more limited

Continued on Page 4

MNNPS welcomes new members

The Society gives a warm welcome to 35 new members who joined during the first and second quarters of 2013.

Listed alphabetically, they are:

First Quarter 2013:

Rich Baker, Golden Valley, MN
Marta Behling-Roser, Minneapolis
Sarah Braman, St. Paul
Christy Caine, Hackensack, MN
Timothy Craig, Duluth, MN
Kathryn Erion, Shakopee, MN
Edward Heinen, Burnsville, MN
Gary Johnson, Oswego, IL
Larry Kennebeck, Golden Valley, MN
Laurie Marinucci, Minneapolis
Chad Miller, Anoka, MN
Jim Platt, Apple Valley, MN
David Senn, Minneapolis
Sharon Toscano, St. Paul
Annalisa Weiler,
Liz Zinsli, Minneapolis

Second Quarter 2013:

Mike Anderson, Inver Grove Hts, MN
Melissa Bokman, Faribault, MN
Joan Brandwein,
Mark Davis, St. Paul, MN
Lindsey Hoffman, St. Paul MN
Nathan Hvidsten, St. Paul, MN
Zachary Johnson, Minneapolis, MN
Jennifer Larson, St. Paul, MN
Joseph Lutz, Minnetonka, MN
Erik & Larissa Mottl, Forest Lake, MN
Dick Oehlenschlager, Mounds View, MN
Eric Ogdahl, Mounds View, MN
Rob Ophoven, Breezy Point, MN
Mitchal Peterson, St. Paul, MN
Erik Runquist, Apple Valley, MN
Amber & Kyle Steele, Albert Lea, MN
Daniel Wovcha, Minneapolis, MN

Welcome, New Members!

Ecophysiology of Wildflowers

Continued from page 3

than in the summer months. One consequence is that a large percentage of spring-forbs, like other plants that grow in adverse conditions (i.e., alpine species), are self-compatible. This insures a seed crop even without pollinators. In addition, spring-forbs aren't especially picky about their pollinators – most can be pollinated by more than one pollinator. Their flowers are usually bowl-shaped to allow access by a diversity of pollinators and they are commonly white, somewhat analogous to a lighted billboard. There are a few spring-forbs, like Dutchman's breeches, that are specialist species. They rely on queen bumblebees for pollination. Interestingly, the specialist species often grow in large colonies to encourage their pollinators to hang around.

Just like a grocery store distributing free samples to entice customers, some spring-forbs such as toothwort and spring beauty produce nectar to help attract pollinators. Others, such as bloodroot and hepatica, don't produce nectar but rely solely on their good-looks. These non-nectar producers usually flower early when the physiological cost of nectar production isn't justified by the lower frequency of pollinators. In a very clever strategy that may be a kind of mimicry, when non-nectar producers grow in clumps with nectar-producing species, pollinators visit them more often. Mom was right – it pays to pick your friends wisely.

In conclusion, round-lobed hepatica, zig-zag goldenrod, and other woodland forbs have evolved an amazing suite of physiological adaptations to grow in our woodlands at different seasons. Plants are truly smarter than we think!

Zig-zag goldenrod (*Solidago flexicaulis*).
Photo by Merel Black courtesy University of Wisconsin-Stevens Point

Two Proposed Threatened Plant Species

by Scott Milburn

[Editors note: The Minnesota DNR has finalized proposed changes to the State's endangered, threatened and special concern (ETSC) species list. Two species with a change in ETSC status are profiled here.]

***Utricularia geminiscapa* Benj.**

U. geminiscapa is generally distributed in the northeast portion of North America and successfully avoided detection in Minnesota until 2004. The discovery was made by Perry Scott who happens to be a longtime cellist with the Indianapolis Symphony Orchestra. To date, there have only been eight total collections in the state. It's a species of bog pools and softwater lakes, which can make collecting a difficult task.

U. geminiscapa is a member of the bladderwort family and one of eight members in the genus *Utricularia* to inhabit Minnesota. Two of the other *Utricularia* species, *U. purpurea* (E) and *U. resupinata* (T) are currently state-listed. *U. geminiscapa* is now listed as Threatened. The specific epithet is based on the morphology of this bladderwort, with gemellus referring to being twin-born or paired, and scap referring to the scape itself. Depending on preference of common name, one can refer to this species as the twin-stemmed bladderwort or hidden-fruited bladderwort.

It is easy to understand why so few records have been documented due to the diminutive size. The leaves are reduced and are alternating. Small bladders are present as is typical with other members of the genus. The bladders, which are actually modified leaves, serve to provide a source of nutrients for the plant by allowing for the trapping of small insects and larvae. Once captured, theses organism are digested and provide nutrients to the plants. This species, unlike any other members of the genus in Minnesota, has both chasmogamous and cleistogamous flowers. The chasmogamous flowers resemble those of *U. vulgaris*, but at a reduced size. The species will generally flower in August through September, making it easier to detect. Yet, the easiest way to identify this species is the presence of the cleistogamous flower. These flowers lack the typical petal and sepal structure and are likely submerged.

Continued on Page 5

MNNPS questions?

Go to www.mnnps.org to see the Society blog, news about field trips, meetings, committees, and all issues of this newsletter since 1982, except the current year.

Two Proposed Threatened Plant Species

Continued from Page 4

Utricularia geminiscarpa
(Hidden-fruited bladderwort)
Photo by Scott Milburn

***Carex novae-angliae* Schwein.**

New England sedge is a member of the Cyperaceae and one of 150 plus species of Carex in Minnesota. Generally all but two species in this genus are native to Minnesota, the exceptions being *C. bushii* and *C. shortiana*. What separates Carices from the remainder of the genera in the family is that the ovary is enclosed in a sac-like structure technically referred to as a perigynium.

The distribution of this species is as far east as Newfoundland, down south to West Virginia, and as far west as Minnesota. New England sedge remained undetected in Minnesota until 2001, when Michael Lee of the Minnesota Biological Survey detected the species in Lake County. Since then, it has been well documented within a linear area that now extends into Cook County. Despite the increase in the number of detections in the past decade, this species is being proposed under the status of Threatened. That is a very agreeable decision based on the limited distribution range in Minnesota.

C. novae-angliae inhabits moist upland forests and transitions between upland forests and forested wetlands. This species has filiform leaves and is loosely cespitose. It resembles *C. radiata* and *C. rosea* in appearance, but the combination of white perigynia and black achenes allow for an easy pair of diagnostic features to hone in on when targeting this species. However the perigynia may be lacking, thus making an accurate identification very difficult.

[Editor's note: the Minnesota DNR revised list of ETSC species became effective on August 19, 2013. The Plant Press will discuss the new ETSC list in the next issue.]

DNR News Release: Spruce needle rust appearing in northern Minnesota

Homeowners in northern Minnesota are noticing their spruce trees turning tan, yellow, orange or sometimes, pink. Most likely these trees are infected with the spruce needle rust fungus, which presents an aesthetic problem but seldom a tree health problem, according to the Minnesota Department of Natural Resources (DNR).

Spruce needle rust infects current-year needles of blue spruce but can also be found on white and black spruce. Infected needles will turn yellow and then shed in the fall. However, healthy buds on the ends of the branches will produce new needles the following year.

"Seeing favorite ornamental trees turn a rusty color and appear to be dying can cause concern, but

Continued on Page 6

***Carex nova-angliae* Schwein - New England sedge** *Photo by Scott Milburn*

Botanists in History: John Torrey

John Torrey (1796-1873) was an American botanist from New York who played a major role in describing and classifying the wealth of previously-unknown plants pouring in from the great exploration of the American West in the early to mid-1800s. Torrey was originally a chemist and a physician, and his earliest hope was to be a machinist. However, his interest in botany was piqued at an early age, when his father took a position at a New York State Prison, and the young Torrey met Amos Eaton, who was at the prison under different circumstances. Eaton was a scientist who later co-founded the Rensselaer School (now Rensselaer Polytechnic Institute) – but who, at the time he met young John Torrey, was serving a five-year sentence for forgery. Eaton tutored Torrey in botany, and it became a lifelong passion for Torrey.

By 1819, Torrey had written his *Catalogue of Plants Within Thirty Miles of the City of New York*, followed in 1824 by the *Flora of the Northern and Middle States*. As a plant taxonomist, Torrey was influential in his adoption of the "natural system" of classification, based on the structure and function of plants, as opposed to the Linnean system, which was based on the arrangement of male and female structures of the flower. Torrey felt that the Linnean system would "go down and I should not like to be the one to prop it up."

Daguerrotype of John Torrey, 1840.
Image courtesy Harvard University Library

Torrey's reknown as a plant taxonomist was well-known as botanical and other biological explorers began to study the vast new territories of the United States. Many expeditions sent samples from their collections to Torrey, including the explorations of Wilkes, Fremont, the Joseph Ives Colorado River expedition, the Mexican Boundary expedition and the Pacific railroad survey. Torrey himself did not travel west, admitting that "I have not herberized outside of a circle of 400 miles radius" of New York City.

Torrey later became the New York state botanist. In the mid-1830s, Asa Gray came to New York to study with Torrey. The two became lifelong colleagues, and together co-wrote the early portions of the *Flora of North America.*

Fourteen endangered, threatened or special concern plant species currently protected in Minnesota were described by Torrey, including seven in the Cyperaceae. The Latin name of pale false manna grass, *Torreyochloa pallida*, means "Torrey's pale grass". [Note: *Torreyochloa pallida* was formerly a special concern species, but was removed from the state's ETSC list, effective August 19, 2013.]

John Torrey's name is most famously attached to the Torrey pine (*Pinus torreyana*), a beautiful, rare pine found near San Diego. The botanical explorer Charles Parry found the tree, and asked Torrey's permission to name it after Torrey.

Continued from Page 5

homeowners shouldn't rush to cut them down," said Mike Albers, DNR forest health specialist. "The fungus only infects the current year's needles, and does not spread from tree to tree."In some years, like this one, spruce needle rust is very common; but in most years it is difficult to find because it requires other plants and specific growing conditions to complete its life cycle.

In early summer, the rust fungus produces spores on the leaves of

Spruce needle rust.
Photo courtesy USDA Forest Service Leaflet R10-TP-99, August 2001

Labrador tea or leather leaf, which grow in peatlands and swamps.

Winds can blow these spores onto current-year spruce needles. Rust fungus produced by the infected tree can reinfect and overwinter on alternate host plants, but this is generally interrupted by changing weather conditions.

Chemical control with a fungicide is usually not helpful and cannot cure the infected needles.

Homeowners and other landowners can find information about tree care and tree diseases on the DNR website.

President's Column

by Scott Milburn

First off, I would like to report that the 2013 Annual Symposium was a success with over 100 people in attendance. We knew going into this that we would likely spend more than we would be able to bring in. However, we were able to justify this due to our financial situation. In particular, we need to acknowledge an anonymous donor several years ago. That donation has been earmarked to help fund the symposium in situations like this. We pay for the travel costs and lodging for the various speakers and that can be a significant expense. We also need to keep the registration cost of the event low. Our event is considerably cheaper than the events hosted by other organizations and we would like to keep it that way while still attracting great speakers.

Additionally, we held board elections at the March monthly meeting. Ken Arndt remains on the board with the additions of Angela Anderson and Jyneen Thatcher. Both new board members are recently retired and we hope to keep them occupied and look forward to their contributions. The Board recently met and we held officer elections. The only change in officers for the upcoming year is the position of secretary. Mike Lynch will be taking over responsibilities for Andrés Morantes. I would like to point out that Andrés was a very valuable member of the Society in the past few years filling the role of both secretary and program coordinator. We need more folks to contribute like he did, even with a hectic personal schedule. The Society does need a new program director and we are looking for volunteers who are interested in the position as well as promoting the mission of the Society as the first members envisioned.

With that, we are also looking to revive our conservation committee. The committee can be headed by anyone and we need members to step forward and serve on this committee. We have some big issues to track from grazing on public lands to funding of the SNA program. We have an opportunity to be a voice for what we believe in, but we need your help.

Plant Lore

by Thor Kommedahl

What is spring forget-me-not? Spring forget-me-not is *Myosotis verna*, in the borage family. It is sometimes called scorpion-grass.

How did it get its names? Forget-me-not is a translation of Old French and whoever wore the flower was not forgotten by his or her lover. Gerard in 1633 called it scorpion-grass because the flowers [in racemes] grow on one side of the stalk and turning back like the tail of a scorpion. Dioscorides named it *Myosotis* because its velvety leaves resembled the ear of a mouse. *Verna*, of course, means spring.

Where does it grow? It is native to dry woods, openings, and banks of the Minnesota River.

What does the plant look like? It is an annual or winter annual, 4-15 inches tall, with small, white flowers. The branches are less curled than the familiar blue forget-me-not. There is one leaf per node. Flowers have 5 petals and the sepals are 5-lobed, with 3 lobes shorter than the other 2. The fruit is a nutlet 1.2 to 1.5 mm long. They bloom April to June.

Myosotis verna.
Image by Tom Barnes, University of Kentucky.
Image @ USDA PLANTS Database

Is it medicinal or poisonous? It is neither. Because of the resemblance of the inflorescence to scorpions it was considered early on to be a remedy for the sting of a scorpion bite. In Kenya, women made a leaf tea of a member of the borage family to induce early labor. Also, pregnant elephants were observed to feed on borage tree leaves near the end of the gestation period presumably for the same reason. These observations have not been verified experimentally.

Has it any other value? It is included in the National Wetland Plant List of Wetland Indicator plants, as a FACU (facultative upland) species in the Upper Midwest.

New Life Members

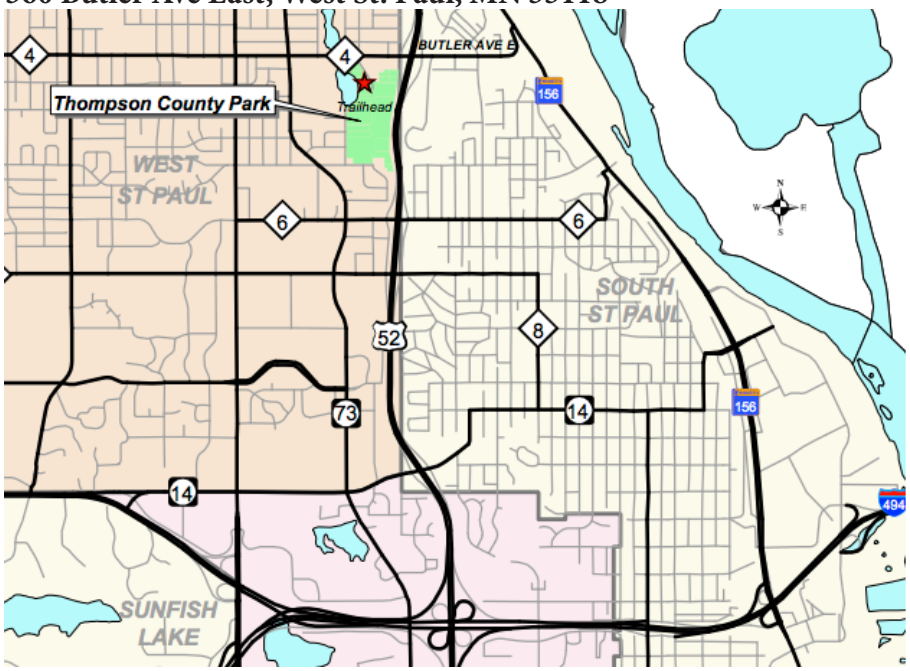
MNNPS is pleased to announce four new life members to date in 2013. They are:

Jeanette Leete and Sean Hunt
Ken and Erika Arndt

Minnesota Native Plant Society
P.O. Box 20401
Bloomington, MN 55420

Spring/Summer 2013

Thompson County Park
360 Butler Ave East, West St. Paul, MN 55118



Directions:
Take Highway 52 to the Butler Ave. E. exit in West St. Paul.
Go west on Butler 0.2 mile to Stassen Lane.
Go south on Stassen Lane to Thompson County Park.

Monthly Meetings Resume

The MNNPS monthly membership meetings "summer break" has ended. The 2013 monthly program schedule will resume Thursday, October 3rd, with doors opening at 6:00 p.m., and the program beginning at 7:00 p.m.