New research reveals more harmful impacts of invasive earthworms

by Dr. Lee E. Frelitch, Department of Forest Resources, University of Minnesota. This is a summary of his talk at the Feb. 3 MNNPS meeting.

Invasive European earthworms have been shown to cause a number of impacts at the ecosystem and plant community level, which were briefly reviewed. Principle among these are changes in the structure of the soil — loss of the organic horizon of the soil (along with its insulating and erosion preventing properties), and increase in bulk density. This results in lower availability of nitrogen and phosphorus and more run-off during heavy rain events. In turn, these changes cause loss of species richness among native plants, increased susceptibility of plants to deer grazing via a double whammy effect of earthworms combined with deer grazing, and replacement of a lush and diverse plant community with a relatively simple community dominated by fewer species.

Recent advances in research were the main focus of the presentation and included earthworm interaction with climate change; facilitation of invasive plant species; longer ecological cascades, referred to as invasional meltdown; and impacts on birds, other vertebrates, and water quality.

The changes in soil structure and nutrient status mentioned above make trees more susceptible to drought at the same time as drought frequency is increasing due to climate change. This will help reinforce the negative effects of climate change on forests within a few hundred miles of the prairie-forest border in the Upper Midwest. Earthworms also create a signature in the rings of trees at the time of invasion — ring widths of sugar maple, for example, are narrowed by about 30 percent. Recovery of ring width occurs a few decades later, but it is not clear at this time whether the trees recover from the changes cause by earthworms, or whether the forest undergoes a period of increased mortality so that a lower of density of trees allows the surviving trees to grow faster due to less competition.

Several papers have been published recently, which combined

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President’s column
by Scott Milburn

The Society elected three new board members at the annual meeting in March. These new members, Dr. Peter Jordan, Mike Lynch, and Otto Gockman, are all new to the board. A small write-up of these three individuals will be included in the next Minnesota Plant Press.

We had our annual symposium at the Bell Museum on March 26th. This was our fifth year at the Bell, and I would like to thank the folks who helped out. The event was very well attended, with more than 150 people present. It is my hope to keep the current committee together for the 2012 symposium. A topic has yet to be decided, but we will be reviewing the evaluations soon for possible ideas.

Another item handed out this year was a questionnaire regarding a five-year strategic plan for the Society. The last few questions were in regards to exploring the idea of donating Welby Smith’s recent Trees and Shrubs of Minnesota book to every public high school in the state. The majority of the responses were very positive, and the Board will be exploring this possibility over the next year. This will not be an inexpensive endeavor, but it would be a great long-term investment in our youth.

Counter to that proposal was a recent amendment to House Bill HF1010 which would allow for logging of oak and walnut trees at Frontenac and Whitewater state parks. As of now, this amendment was removed from the bill, but it could reappear. It raises questions about short-sighted political maneuvering in difficult economic times.

Those who care about natural resources need to be diligently reading the amended items that end up in proposed legislation. This amendment to allow logging might have passed through the House had it not been publicized in the news.

I hope that as a Society we can be the ones shedding light on these issues and raising awareness. We have the ability through our blog and Facebook page, but we need responsible members to take the initiative and to help keep us all informed.

Minnesota Native Plant Society’s purpose
(Abbreviated from the bylaws)

This organization is exclusively organized and operated for educational and scientific purposes, including the following.
1. Conservation of all native plants.
2. Continuing education of all members in the plant sciences.
3. Education of the public regarding environmental protection of plant life.
4. Encouragement of research and publications on plants native to Minnesota.
5. Study of legislation on Minnesota flora, vegetation, ecosystems.
6. Preservation of native plants, plant communities, and scientific and natural areas.
7. Cooperation in programs concerned with the ecology of natural resources and scenic features.
8. Fellowship with all persons interested in native plants through meetings, lectures, workshops, and field trips.

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Changes in the board

Dr. Peter Jordan, Mike Lynch, and Otto Gockman will replace three board members whose terms expire in June. Derek Anderson and Russ Schaffenberg recently resigned.
Earthworms
Continued from page 1

with my observations, show that earthworms facilitate the invasion of European buckthorn (not to be confused with our native buckthorn that grows in swamps of northern Minnesota), tatarian honeysuckle, garlic mustard, black swallowwort, Japanese barberry, hemp nettle (Galeopsis tetrahit), and Veronica officinalis. These species coevolved with earthworms on their home continent and germinate and survive best under bare mineral soil conditions created by earthworm invasion. In addition, a longer chain of invasional meltdown has been detected, whereby earthworm invasion facilitates European buckthorn in woodlots in agricultural areas. European buckthorn is the overwintering host of the soybean aphid (a major pest for farmers in recent years), which in turn is the food source for exotic ladybeetles that become pests and cause allergies in people’s houses in October.

Earthworms also impact habitat for vertebrate wildlife species. Ground-nesting birds such as ovenbird and hermit thrush have been shown to have lower nest density in earthworm-infested areas by Scott Loss, a Ph.D. candidate in Conservation Biology at the University of Minnesota. Research conducted in upstate New York shows that salamanders are negatively impacted by European earthworm invasion.

Finally, the loss of the organic horizon (duff layer) and greater bulk density of soils can influence water quality of lakes invaded by European earthworms, even in remote areas like Itasca State Park. We know that there is more runoff and erosion, as well as leaching of nutrients such as P, when earthworms invade. University of Minnesota limnologist Jim Cotner and his intern Hal Halvorson showed that level of

Spring field trips
by Ken Arndt, MNNPS field trip coordinator

Hastings Scientific and Natural Area
Saturday, April 23
Join field trip leaders Scott Milburn (MNNPS president and senior botanist/ecologist for Midwest Natural Resources) and Ken Arndt (MNNPS board member and forest ecologist for Critical Connections Ecological Services) at Hastings SNA for an afternoon of hiking and early spring wildflower identification. A highlight to the field trip will be seeing the rare snow trillium (Trillium nivale) in bloom.

This field trip will be limited to 20 MN NPS members.

Eloise Butler Wildflower Garden and Bird Sanctuary
Saturday, May 7, 10 a.m. to noon
MNNPS members will take a tour with trip leaders Elizabeth Heck (MNNPS board member and Eloise Butler Wildflower Garden naturalist) and Shirley Mah Kooyman (MNNPS vice president and wildflower enthusiast) through Eloise Butler Wildflower Garden, the oldest wildflower garden in the country. This historic garden is home to over 500 species of plants, all within 14 acres.

Due to the narrow trails within the garden, this field trip will be limited to 20 MNNPS members.

watershed infestation in six small lakes in Itasca Park was related to measures of eutrophication.

The circle of invasive earthworm research is ever widening. Earthworms truly deserve the title of “Ecosystem engineers,” as well as Darwin’s comment in his 1881 book: “It may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organized creatures.”

Hastings Sand Coulee Scientific and Natural Area
Thursday June 9, 6 to 8 p.m.
By popular demand, we are offering this trip for a third year in a row. Join field trip leaders Karen Schik (ecologist for Friends of the Mississippi River), Tom Lewanski (conservation director for Friends of the Mississippi River), and Dave Crawford (“retired” naturalist from Wild River State Park) for an evening hike into one of the DNR’s newest Scientific and Natural Areas. Hastings Sand Coulee is a dry sand prairie about 80 acres in size located just beyond the southern edge of the City of Hastings.

This is a joint field trip with Friends of the Mississippi River and will be limited to 15 MNNPS members.

For additional information about these trips, go to our website at www.mnnps.org and follow the link to the field-trip page. Details on driving directions and meeting areas will be e-mailed to participants who register for each trip.

More trips are being planned for summer and fall. Watch for e-mail updates.

A friendly reminder: our field trips are for members only. If you would like to become a member or if you need to renew your membership, now is a great time to join. Renew by downloading a membership form from our website (www.mnnps.org) or use PayPal at the website. Just follow the link to Membership from the home page. I hope to see some of you at an upcoming field trip.

Have you read our blog?
It is on the MNNPS website: www.mnnps.org
Lakeshore plantings can maintain access while protecting shore, views

by Rusty Schmidt, natural resources specialist, Washington Conservation District. This is a summary of his talk at the March 3 MNNPS meeting.

Rusty Schmidt showed from start to finish several projects throughout the metro area. Most were sunny shorelines with lawn-grass shores that were replaced with native upland and transitional shorelines all the way into the water, with some aquatic plants. The plantings were very showy, with a number of blooming plants throughout the year.

The average shoreline owners value their shore of a lake, stream or wetland for the ability to access the water and the views. To accomplish these goals, practical designs can be created by planting and maintaining good aquatic vegetation within the water, then a transition of plants that like moist to wet soils, and finally an organized upland planting that still provides the views the landowner desires and access to the water’s edge.

Trees and shrubs are perfect to provide screening for certain areas and to frame views. The closer the tree is to the viewpoint up the bank, the less obstructive it is to the shore view. Yet it still provides habitat and shade. By creating the complete shore with all levels of structure, habitat is also provided for wildlife.

The upland portion of the planting should have some organization and regard to aesthetics, with more flowers than grasses, and easy access to the shore and showy plants. The transitional plantings should be chosen for habitat and toleration of water fluctuations and have a higher ratio of grasses and sedges with the fibrous root systems. Plantings in the water will protect the shore from some of the wave action and provide fish and aquatic insect habitat. Typically, aquatic plantings will need larger plants planted. They will absolutely need permits before that portion of the projects can begin.

Some of the materials that will be needed will include a wave break, that may be a fence or biolog, to slow down the wave action hitting the shore. Biologs are shredded coconut fibers bound into a big log with various dimensions. They provide resistance to wave action; substrate for plants planted into them; and capture sediment from upland areas. Other materials that can be used are Enviro-loc Bags, which are sandbags made of filter fabric and filled with the soil media. Once filled, they can be stacked into a wall or used for slowing down water in a flow, as a check dam or wing dam. Then the bags are planted with deep-rooted plants that will take over the bags in time.

Another option is to use Pre-Vegetated Erosion Blankets. These blankets are pre-ordered for a site with two layers of blanket and soil placed between with seed that is specified for the site. The seed is grown, and then the blanket is cut and rolled like sod. Once delivered to the site, the sod is rolled out on site for instant shoreline planting.

New plantings need site preparation and protection from rabbits and geese. Fences are the best defense against unwanted critter invasions of the new plantings. Other methods include sprays and a deer scarecrow.

Three options for site preparation are smothering, mechanical, and chemical preparation. The smothering method uses black plastic or newspapers to smother the existing plants and seeds on site. The mechanical method uses a sod cutter or larger soil mover like a skid-steer or bulldozer. The most common method for ease and cost is to use a glyphosate chemical of Rodeo or Round-up or one of the generics. Round-up is to be used in the upland. Anywhere near the shore, Rodeo or its generic counterparts should be used.

**Plant-of-the-Month**

Chelone glabra

by Rusty Schmidt.

Chelone glabra (turtlehead) has an interesting flower head that when pinched looks like it is a talking turtle, similar to a snapdragon. Also similar to bottle gentian, this flower is pollinated only by the large bumble bees, as its flower opening is difficult to enter to get to the nectar source at the back. Turtlehead is a robust perennial one to three feet high, has a bluntly angled stem and opposite, elongate and coarsely toothed leaves. It is found in grassy and bushy meadows and will thrive in all but the deepest shade. It prefers moist soils.
On Larix in Winona County
by Philip A. Cochran, Ph.D., professor, chair of Biology Department, Saint Mary’s University, Winona, Minn.

There is a tamarack (Larix laricina) on the Saint Mary’s University campus. I assume that it was put there by the botanist who founded our biology department, Brother Charles Severin (1896-1992), because it sits in line with a ginkgo (Ginkgo biloba) and a bald cypress (Taxodium distichum) next to our science building in a convenient location for demonstrating deciduous gymnosperms.

Tamaracks have not been formally documented from Winona County (G. B. Ownbey and T. Morley 1991, W. R. Smith 2008), but L.H.Bunnell (1897) noted that they occurred on bluffs in Homer, and unlike certain other tree species, he did not indicate that they had escaped cultivation. Moreover, the botanist John Holzinger (1913) also listed them among the trees of Winona County.

Across the Mississippi River in Trempealeau County, tamaracks are known from bog-like habitats along Tamarack and Little Tamarack creeks, and they may sometimes grow from acidic sandstone outcrops in southwestern Wisconsin (Hansen 1993). They can be easily observed along Tamarack Creek by driving north along State Highway 93 from Centerville in the fall, and some can still be seen in upland habitat along side roads.

On Nov. 15, 2006, I was driving along Old Homer Road southeast of Winona, when I noticed multiple golden spires of what could only have been Larix on a steep forested bluffside overlooking the lowlands along Pleasant Valley Creek. At least two dozen trees of various sizes extended along approximately 100 meters of north-facing slope behind private residences along Old Homer Road, and once I knew they were there, I could see them from U.S. Highway 61.

It took me some time to get permission to access the slope behind one of the homes, but on Aug. 1 and Oct. 24, 2007, I was able to secure some samples (Bell Museum 918878). The relatively large cones and long needles revealed that the trees were not tamaracks, but rather European larch (L. decidua), and the presence of many saplings indicated that successful reproduction had occurred. Later, I found several additional larches growing from sandstone outcrops along Garvin Heights Road in Winona. Once again I was alerted to their presence by their golden foliage persisting after most other trees had dropped their leaves. In this case, an obvious source was a large tree in the Woodlawn Cemetery downslope from Garvin Heights Road. W. R. Smith (2008) noted reports that European larch had escaped cultivation in the eastern U.S.

For some reason, a European larch does not occur next to the tamarack, cypress, and ginkgo outside our science building on the Saint Mary’s University campus. I have noted a tendency for some of our staff to assume that the cypress is a European larch, and an outside consultant hired by our grounds department listed it erroneously as a dawn redwood (Metasequoia glyptostroboides), another deciduous species. The latter can be found, along with a cypress, on the Winona State University campus. The only European larch on the Saint Mary’s campus grows along the upper edge of the wooded terrace slope east of Saint Joseph Hall.

Linda Huhn is lifetime member

Linda Huhn, long-time program coordinator for the Society, was awarded the Lifetime Membership Award during the Symposium program. In her thank-you to the board, she wrote:

“Serving on the board, being secretary for a year and coordinating the programs was a great honor for me, not to mention educational and fun. I did the programs for as long as I did because of the example of others working for the Society, and I just could not quit when all of you were giving so much.

“Preserving Earth’s beauty and living sustainably is something I learned from my Dad Delmar, the guy who took our family on trips around Minnesota, but mostly out west. … The Nature Conservancy showed me later, in my adult life, how beautiful Minnesota itself is, and I made it a goal to see it and do what I could to preserve the beautiful places. The Plant Society seemed like home when I discovered it and made so many friends.”

Emerald ash borers cross Mississippi

Ash trees along West River Parkway in south Minneapolis are now infected with emerald ash borers. About 100 of these trees along the river and another 100 in the previously infected Prospect Park neighborhood will be cut soon. Last year, 1,400 ash trees in other parts of the city were cut as preventive measures.

Treasurers’ report

Treasurers Ron and Cathy Huber report that in the first quarter of 2011, the Society had total income of $8,829.13. This was mainly from membership dues and Symposium registration fees. Expenses totaled $3,992.16, primarily Symposium costs. Assets on March 31, including CDs, totaled $19,945.66.
Illustrated books about Minnesota mushrooms

by Dr. David McLaughlin, Department of Biology, University of Minnesota. He spoke at the April 7 MNNPS meeting.

The book that I most recommend for the beginner is the one by George Barron. Several of these books are nation-wide in coverage, and a significant number of the species may not occur here.

No book covers all Minnesota mushrooms, as there are regional differences in mushroom floras. Two that focus on nearby states (Courtney and Burdsall, Huffman et al.) are likely to have use here, but may cover only some parts of the state, as the mushroom flora changes in the different biomes.


MNNPS welcomes new members

The Society gives a warm welcome to 22 new members who joined during the first quarter of 2011. They are:

Marcus W. Beck, St. Paul; James G. Carlson, Lake Elmo; Nancy Carlson, Isanti; Christopher Currey, Lafayette, Ind.; Troy Eagan, Rochester; Steve Emmings, Excelsior; Karen Stout Heller, Verndale; Anita P. Hoaglund, St. Paul; Jacob and Kathryn Huebsch, Jordan; Dorothy J. Jachim, Stillwater; Michael Kaluzniak, St. Paul; Ruth Henriquez Lyon, Duluth; Cathleen Marquardt, Eagan; Megan Kranz McGuire, St. Paul; Stephanie McNamara, White Bear Lake; Chad and Shannon Skally, St. Paul; Paul and Alex Skawinski, Stevens Point, Wis.; Edward Stec, Wyoming; Mary Williams, White Bear Lake.

New pollinator program will create native habitats

Native Habitat Development for Pollinators is a new U.S. Department of Agriculture option for farmers enrolled in the Conservation Reserve Program (CRP). It is defined as “restoring and conserving native plant communities to benefit pollinators and associated wildlife species.”

This plan requires plantings that contain at least three species from each flowering group — early, mid- and late-season. The seed mixes must consist of at least nine native species, including two or three grasses. The grasses may not exceed 25 percent of the seed mixes. Minimum acreages range from 1 acre to 10 percent of total CRP acreage.

Conservation Corner

by Elizabeth Nixon

Rep. Steve Drazkowski (R, Mazeppa) proposed an amendment to an environmental finance bill that would require logging at Frontenac and Whitewater State Parks. This surprise amendment was tacked onto the large environmental finance bill in late March but was not included in the final bill. However, it could resurface during the continuing budget battles.

Examination suggests that elected officials did no research to understand what native forest communities look like and the critical roles black walnut and oak play in the long-term viability of forest ecosystems.

Conserving Minnesota native plant communities is critically dependent on each of us demanding credible, full disclosure research by those we elect to represent us.
Plant Lore
by Thor Kommedah

What is twinleaf?
Twinleaf is *Jeffersonia diphylla* in the barberry family. It is also called rheumatism root.

How did it get its names?
*Jeffersonia* was named for Thomas Jefferson, who was then U.S. Secretary of State, by his friend Benjamin Smith Barton, later a professor at the University of Pennsylvania. He wanted to honor Jefferson’s considerable interest in natural history. *Diphylla* (two leaves) and twinleaf describe the one or few basal leaves, almost divided into two half-ovate parts. Rheumatism root was so named because American Indians used a wash from its roots and rhizomes to treat rheumatism.

Who discovered twinleaf?
André Michaux found the plant in Virginia and gave it to John Bartram, who planted it in his garden. Benjamin Barton saw it there, described and named it after Jefferson, and published the description.

What does the plant look like?
It is a perennial, 4 - 18 inches tall, with a leaf divided at the base to look like two paired leaves, and one or more leafless flower stalks (scapes) with a single white flower of eight petals on top. They resemble bloodroot flowers. The fruit is a pear-shaped, green capsule with a lid on top. Twinleaf blooms from April to May, and plants are gone by August. The flowers last only a couple of days.

Where does it grow?
Twinleaf grows in rich, moist woods in about five counties in the southeast corner of the state. It is usually found over limestone or other calcareous rocks, and is more abundant east of Minnesota. The only other *Jeffersonia* species grows in northeastern China and Korea (explained by the continental drift).

Is it edible, medicinal, or poisonous?
Not edible. American Indians made a root tea for dropsy, diarrhea, urinary ailments, and applied it as poultices for sores and ulcers. It contains the alkaloid berberine, an antibiotic, and has also been used in eyedrops, for treatment of leishmaniasis, and experimentally for diabetes and cardiovascular conditions. Berberine can also be toxic.

Can it be grown as a garden plant?
It grows well in shaded, moist garden soil for an early spring flower, but it doesn’t last long. Seeds do not store well. Ants disperse seeds; rodents cache them for later consumption.

Lost and Found
Two thermos containers (silver one had two tea bags, pink one had coffee) were found after the Symposium held at the Bell Museum March 26. If you lost either one, please contact Shirley Mah Kooyman at 763-559-3114 or smkooyman@gmail

Photo of twinleaf (*Jeffersonia diphylla*) by Peter Dziuk.

Three BioBlitz events are being planned

Individuals and families are invited to participate in BioBlitzes at Lake Vermilion/Soudan state parks, Macalester College’s Ordway Field Station in Inver Grove Heights, and Blomberg Lake SNA in Wisconsin. Participants will help count and map flora and fauna, from bacteria to insects, plants, birds and animals.

**Soudan Underground Mine, Lake Vermilion state parks; June 25, 12 noon – 12 noon, June 26.**

The Minnesota DNR is looking for participants and team leaders. Inventories and programs will take place at established times throughout the 24-hour period. Details will be posted on the Lake Vermilion State Park website (www.mndnr.gov/vermilion). For more information, send an e-mail to tavis.westbrook@state.mn.us

**Macalester’s Ordway Field Station, Inver Grove Heights; Friday, June 10, 5 – 11:59 p.m.**

The Katharine Ordway Natural History Study Area is located at 9550 Inver Grove Trail, Inver Grove Heights. This BioBlitz is co-sponsored by Macalester College, the Mississippi National River and Recreation Area (MNRA), and the Mississippi River fund. For information, contact dosch@macalester.edu

**Blomberg Lake SNA, Burnett County, Wisconsin**

July 9, 12 noon - 6 p.m.; July 10, 9 a.m. - 3 p.m.

This SNA is north and west of Siren, Wis. Details will be available from the Botanical Club of Wisconsin website (https://sites.google.com/site/botanicalclubofwisconsin/). Contact Paul Skawinski at lakeplants@yahoo.com or go to the Blomberg Lake SNA page on the Wisconsin DNR website.
Spring 2011

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

**Directions:**
Take MN Hwy. 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.