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FIELD BOTANISTS OF ONTARIO

NEWSLETTER

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President's Message

This combined fall/winter newsletter marks the end of 2016 and wraps up another fine year of field botany in Ontario. I, for one, have been appreciating the cooler temperatures and (somewhat) slower pace of fall, after a busy and sweltering summer; but as winter settles in, as a field botanist, I cannot help but look forward to spring, as well as look back on the past field season.

Since February, the FBO has hosted 17 field trips and workshops across the province, exploring new places and revisiting old favorites for the botanical richness that Ontario has to offer - from the Ausable River valley in Southwestern Ontario, through Norfolk and Niagara, east to Ottawa and north to Sudbury, the Bruce of course, and even downtown Toronto, and many places in between.

Every field trip and workshop that the FBO offers is an opportunity for discovery. On our trips, I see people of all ages, backgrounds, and levels of expertise engaging with each other and the plants and places around them, creating connections. Whether you're a seasoned professional or just starting out in the field, you are sure to come away with a greater appreciation and knowledge of Ontario's flora and natural history. The FBO has been very consistent in offering high quality field experiences in botany and this year has been no exception.

Our success, of course, has always depended on the work of our volunteer trip leaders who graciously share their time and expertise with the members. So, thanks to our 2016 field trip leaders: Troy McMullen, Tony Reznicek, Ed Morris, Paul Sokoloff, Steve Varga, Tyler Smith, Jim Dougan, Charles Cécile, Graham Buck, Tristan Knight, Tyler Miller, Chris Zoladeski, Walter Muma, James Kamstra, Bill Draper, Will Van Hemmesen, Mary Gartshore, Peter Carson, Albert Garafolo, Peter Beckett, and Deborah Metzger.

Thanks to everyone for making 2016 an eventful year in field botany. See you in the New Year.

Dan Westerhof

On the cover: FBO members examining Walking Fern (*Asplenium rhizophyllum*); Photo Paul Eagles. American Chestnut (*Castanea dentata*) at Spooky Hollow; Photo Bohdan Kowalyk.

Sidebar artwork: Spotted Joe Pye Weed (*Eupatorium maculatum*).

Trip location maps generated using NatGeo Mapmaker software.

The suggested standard source for scientific and common names is the Database of Vascular Plants of Canada (VASCAN): (<http://data.canadensys.net/vascan/search>).

Field Botanists of Ontario website: www.trentu.ca/fbo

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Annual memberships are \$20.00 for individuals and \$25.00 for families. Membership forms can be found on the FBO website above.

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(FBO) is a non-profit organization founded in 1984 for those interested in botany and conservation in Ontario.

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Editor's Note

You will need a bit more time to read this issue of our newsletter. Due to (or thanks to) the unevenness of trip report submissions, quiet periods with nothing coming your editor's way followed by several reports landing on the desk in quick succession, the effect is this double issue.

Hopefully, everyone will find an article suiting their particular interest. There are shorter and longer pieces in a variety of writing styles, reporting on FBO trips from across the province. Tony Reznicek attracted the expected high turnout of botanists eager to upgrade their identification skills, in the floristically rewarding Ausable River valley area. At the other geographical end, just outside Ottawa, a different assemblage of northern species was explored in a peatland (a second trip to that location in just a few years). In between these two locales, and just outside the GTA, there are also places that we visited this year that (almost) rival sites from our southernmost counties, or the Bruce.

So, just like President Westerhof comments on the opposite page, this was another productive FBO year, topped up with a well attended Annual General Meeting. The direct fruit of the AGM are two submissions, one on tall grass prairie restoration, the other on the 2016 recipient of the Goldie Award, James Phipps.

Enjoy the reading and a Merry Christmas to you all.

Chris Zoladeski

Field Trip Reports

Floristic affinities with East Asia in the Ausable River Valley and Parkhill Conservation Area

23 April, 2016

By Philippa Kilbourn

An eager group of twelve FBO members met up on Fossil Road by the Ausable River with “BotanIcon” Tony Reznicek, our trip leader for the day. Our exploration lasted until mid-afternoon, on a chilly but magnificently sunny April day. Before we set out, Tony fielded a question about Virginia Broom-sedge (*Andropogon virginicus*), which was growing by the side of the gravel road where we had congregated. Reznicek is a masterful storyteller with a wealth of botanical knowledge, who not only puts each plant in context, but can recount an anecdote *ad hoc*. The first such was about the humble Broom-sedge, branded as an invasive, but in fact a native ‘pre-settlement’ species; it was apparently not known to grow in Ontario until the 1950s when the era of highway building began in earnest. Previously associated with pre-settlement sand barrens, it is now an “up and coming species”, according to Reznicek. Reminiscent of Big Bluestem (*Andropogon gerardii*), the spikelets of *virginicus*, instead of being on exerted peduncles, are on spathe-like bracts.

We then carpoled to Joany’s Woods, a nature preserve of 367 acres, which contains an ANSI (Area of Natural and Scientific Interest). A sign at the entrance proclaimed “botanizing” to be one of its approved uses, as if being under Tony’s tutelage weren’t reason enough to be in such an idyllic spot. We did encounter unprescribed uses of the ANSI, such as two motocross bikers roaring over the

blind crest of a steep slope as we were climbing up. Undeterred by warnings that they weren’t “legal”, they kept it up, later claiming to be “lost”. “Yer just wreckin’ the joint” grumped one FBOer.

The second plant to catch our collective attention was Bladdernut (*Staphylea trifolia*), recognized by its striped bark and bladdery fruit from the previous year, inside which a seed was sealed. It’s “the original bubblewrap”, quipped Tony.



As we entered Joany’s Woods proper, the spectacle unfolded – White and Yellow Trout-lilies, two species of the genus *Erythronium* (*album* and *americanum*, respectively) growing cheek by jowl! Over the course of the day, we witnessed them opening up in the warmth of the spring sun. Both require vernalization, i.e., temperatures between 5 and 10 degrees Celsius, to grow. These two Trout-lilies of Carolinian Ontario can be distinguished by the length of the “stigmas, which tend to be “slightly longer and more distinctly separated in *album* than are those of *americanum*, which are generally shorter, spreading or recurved”. Another difference noted was the blue-green cast to the leaf colour of *album*. What is really intriguing is that both have been “outed as complex species”, whose closest relatives are neither the southern *Erythronium umbilicatum* nor *E. rostratum*, but rather their Chinese ‘cousins’, which also grow in a belt of temperate deciduous forests. Having participated in



Tony Reznicek, surrounded by his admirers. Photo: P. Kilbourn.

We were privileged to see the flowering of Three-leaved Toothwort (*Cardamine maxima*), relative to the frequency of the Cut-leaved Toothwort (*C. concatenata*; S5) - the S ranking of the Three-leaved (S3) made this a special sighting.

Tony waxed poetic on the topic of his favourite tree, Tulip Tree (*Liriodendron tulipifera*), an ancient genus within the Magnoliaceae, about 40 million years old. Fast growth and longevity are its features. He described the dispersal mechanism: the fruit, which looks like a cone, opens up in winter and winged follicles come off and disperse on snow and ice where they are easily carried along. The largest exemplar

2012 on a collecting trip to China, Tony frequently made comparisons with East Asian species during our excursion.

On the slopes of the Ausable Valley we also observed large communities of Canada Wild Onion (*Allium canadense*, "our native onion"). A lot of it is picked over or overharvested, so it is difficult to find large populations. Tony pointed out that *Allium canadense* could be mistaken for the rarer Nodding Wild Onion (*Allium cernuum*), when not in bloom.

seems to be 170 ft. tall and grows in the Appalachians. Another of Tony's Chinese facts was that the only other species of *Liriodendron* is native to China.

Other plants in bloom included the dioecious Spicebush (*Lindera benzoin*), probably the female, Swamp Buttercup (*Ranunculus hispidus* var. *caricetorum*) associated with swamp edge, Bloodroot (*Sanguinaria canadensis*) in bloom, and Common Hackberry (*Celtis occidentalis*), the preferred feeder for pollinators.



White Trout-lily from above. Photo: P. Kilbourn.

Sharp-lobed Hepatica (*Anemone acutiloba*) was starting to bloom, although its liver-shaped leaves were tightly furled and stems furry at this stage. Another spring ephemeral Tony had scouted were specimens of the exquisite Virginia Spring-beauty (*Claytonia virginica*) in bloom. The leaves were longer and narrower than Carolina Spring-beauty (*Claytonia caroliniana*).

As we made our way up from the seep, there was Red Trillium (*Trillium erectum*), another early spring treat, evidently "a few days ahead" of its large-petalled counterpart White Trillium (*T. grandiflorum*), growing side by side. Tony lamented the difficulty of finding the very rare Snow Trillium (*Trillium nivale*), which he is convinced is growing in the area, as it likes calcareous sites.

Another special plant of these rich deciduous forests was Giant or Early Blue Cohosh (*Caulophyllum giganteum*). Appalachian in distribution, its western limit is Michigan. It is distinguishable by its deliciously dark purple flowers and their long styles, but more particularly, by the simultaneous emergence of the flower and the plant itself well before the leaves unfurl/expand. The more familiar Blue Cohosh (*Caulophyllum thalictroides*) was not yet flowering in late April. Its blooms will be greenish yellow. Another curiosity Tony pulled out of his vast store was that Cohosh berries are not really fruit, but naked seeds! He went on to say that this plant “presents the most remarkable adaptation”: the ovary wall does not grow but, rather, the pollinated ovule pushes out through the wall; thus the seed is technically a gymnosperm. *Caulophyllum* is an ancient genus of which there are only three species extant; the third, *C. robustum*, is native to...? “China, of course”, quipped Tony.

We then came across a lone flowering specimen of Dutchman’s Breeches (*Dicentra cucullaria*). Tony pointed out that Michigan, unlike southern Ontario, is less urbanized and has extensive game areas designated for hunting; this favours the spread of this plant.

Another plant characteristic of moist areas in beech-maple woods and upland forests is Wild Leek (*Allium tricoccum*);

we nosed it out before seeing its extensive ground cover. The *tricoccum* differs from the other species of Wild Leek, *Allium burdickii* (*A. tricoccum* var. *burdickii*) which has leaves that are narrower, more silvery, and lacking red pigmentation at the base. There is a substantial difference in number of flowers, but telling them apart at the fruiting stage is difficult. Although they rarely grow together, there is a very narrow zone of overlap in southern Ontario and southern Michigan.

Blunt-leaf Waterleaf (*Hydrophyllum canadense*) was not flowering. Nevertheless, in early spring it was easily identifiable by its speckled leaves. By late summer, Blunt-leaf Waterleaf no longer will have this whitish mottled appearance. What’s more, the leaf will become more palmate, reminiscent of a maple leaf.

A small colony of Skunk-cabbage (*Symplocarpus foetidus*) indicated the presence of a seep at river bottom, as did the bright yellow Marsh-marigold (*Caltha palustris*), which also likes seeps and stream edges.

Although Tall Bellflower (*Campanulastrum americanum*) blooms in summer, Tony showed us a stem from the previous year, pointing out the capsule dehiscence of this biennial. One key feature is that the fruit dehisces along two or more sutures, derived from two or more carpels, usually several- or many-seeded. The seeds then break through the capsule to propagate.

Common Blue Violet (*Viola sororia*), which prefers beech-maple deciduous or swampy woods, was the only violet we saw in bloom. When we reached the upland, False Rue-anemone (*Enemion biernatum*) was blooming in colonies. This showy, buttercup-like flower, an early bloomer, is very localized occurring in Lambton, Middlesex and Elgin counties. What Tony finds fascinating is that False Rue-anemone forms vegetative clones of the mother plant. Its

fruits are follicles, whereas Rue-anemone’s (*Thalictrum thalictroides*) fruits are achenes.

After a lunch break at conveniently located picnic tables in the Parkhill Conservation Area, we entered the steep valley of a tributary of the Parkhill Creek. Tony pointed out several specimens of Leatherwood (*Dirca palustris*) with their drooping pale-yellow flowers and their stamens protruding from the bell-shaped



Wild Ginger (*Asarum canadense*). Photo: P. Kilbourn.

blooms. In trying to bend the branches we were reminded how flexible and leathery this shrubby plant truly is. Newcomb’s Wildflower Guide states that “it was used by the Indians (First Nations) for thongs”.

Another early spring ephemeral of the Carolinian habitat was Twinleaf (*Jeffersonia diphylla*), growing on the river floodplain. More and more of these short-lived flowers seemed to pop up at different elevations. What a spectacle! Carolina Spring Beauty (*Claytonia caroliniana*) was also in bloom here, as was a colony of Early Meadow-rue (*Thalictrum dioicum*) shedding pollen.

Though by no means rare, American Fly-honeysuckle (*Lonicera canadensis*) was found blooming in these same woods, a northern plant found here close to its southern limit. An indicator of slightly acidic rich woods, the spring ephemeral Dwarf Ginseng (*Panax trifolius*) was present but not yet flowering. Unlike medicinal ginseng,

its very spotty tuberous root is not anthropomorphic, nor is it harvested, said Tony.

When someone spied a stand of Plantain-leaved Sedge (*Carex plantaginea*) with its broad hallmark seersucker leaves, the group took a break from Spring ephemerals for sedge stalking and gawking, despite the absence of perigynia for positive identification so early in the season. The sedge enthusiasts among us were rewarded by a sighting of the provincially rare S2 Carey's Sedge (*Carex careyana*).

Towards the end of our day we were treated to another emblematic plant of the season: Harbinger-of-spring (*Erigenia bulbosa*), a fitting conclusion to another Tony Reznicek discovery walk, which we were very privileged to be part of. ✨

Aromatic Botany at Bonnie Heath Estate

20 August, 2016

By Laurel Christie

What I really appreciate about FBO trips is that they bring us to unique places that we would never discover otherwise. The same was true of our trip to Bonnie Heath Estate on August 20th, led by Chris Zoladeski. The Estate is located on a narrow country road in Norfolk County, about half way between Brantford and Port Dover. The Estate is a newly opened family-run winery and lavender farm and distillery, on a former tobacco farm. As there had been no substantial rainfall here in almost four months and with the area's sandy soils, I am amazed that the plants seen here were not in worse shape.

We first headed into a moist regenerating forest habitat where the wonderfully fragrant Spicebush (*Lindera benzoin*) was abundant. One of the few members of the Lauraceae family that are found in a temperate climate, we also later spotted its close relative along the forest edge - Sassafras (*Sassafras albidum*). The bright yellow that the leaves turn must make for a lovely walk here in fall. Someone in the group also mentioned that the northern range for Spicebush is Halton Region.



Under a canopy of Green and Black Ash (*Fraxinus pennsylvanica* and *F. nigra*), Scots Pine (*Pinus sylvestris*), as well as Ironwood (*Ostrya virginiana*), Basswood (*Tilia americana*), Red Oak (*Quercus rubra*), Black Cherry (*Prunus serotina*), Shagbark Hickory (*Carya ovata*), Yellow Birch (*Betula alleghaniensis*) and Red and Sugar maple (*Acer rubrum* and *A. saccharum*), we were able to make out a diverse understorey. Blue Beech (*Carpinus caroliniana*) was common, along with Beaked Hazel (*Corylus cornuta*), Running Strawberry Bush (*Euonymus obovatus*), Maple-leaved Viburnum (*Viburnum acerifolium*) and Witch Hazel (*Hamamelis virginiana*). As someone



Restored Tallgrass Prairie. Photo: L. Christie.



The beauty of *Lindera bezoin*. Photo: L. Christie.

commented, it looked like a Skunk Cabbage (*Symplocarpus foetidus*) ‘graveyard’, with the wilted remnants lying in all directions. Other groundcovers included Jack-in-the-pulpit (*Arisaema triphyllum*), Trilliums (*Trillium* species), Wild Lily-of-the-valley (*Maianthemum canadense*), Star-flowered Solomon’s Seal (*M. stellatum*) and False Solomon’s Seal (*M. racemosum*), growing side by side, Five-leaved Virginia Creeper (*Parthenocissus quinquefolia*), Bloodroot (*Sanguinaria canadensis*), White Baneberry (*Actaea pachypoda*), Herbaceous Carrion Flower (*Smilax herbacea*), Zig-zag Goldenrod (*Solidago flexicaulis*), and Heart-leaved Foam-flower (*Tiarella cordifolia*). Ferns seen included Sensitive (*Onoclea sensibilis*), Cinnamon (*Osmundastrum cinnamomeum*), Interrupted (*Osmunda claytoniana*), Ostrich (*Matteuccia struthiopteris*), and Christmas (*Polystichum acrostichoides*).

Along the forest edge were some interesting sightings, including American Groundnut (*Apios americana*), Blue Lobelia (*Lobelia siphilitica*), the endangered Butternut (*Juglans cinerea*), Black Walnut (*Juglans nigra*), Black Oak, (*Quercus velutina*), Bitternut Hickory (*Carya cordiformis*), Alternate-leaved Dogwood (*Cornus alternifolia*) and Pokeweed (*Phytolacca americana*). Other common plants included Small Crabgrass (*Digitaria ischaemum*), Multiflora Rose (*Rosa multiflora*), Witchgrass (*Panicum capillare*), and Yellow Nut-grass (*Cyperus esculentus*).

In addition to switching from tobacco to grapevines and lavender fields, the owners had made a conscious decision to dedicate a large portion of their property to restored prairie. The seeded-in habitat included the big three grasses – Indian (*Sorghastrum nutans*), Big

Bluestem (*Andropogon gerardii*) and Switchgrass (*Panicum virgatum*). Wandering the multitude of mown paths, other wildflowers found included Virginia Mountain-mint (*Pycnanthemum virginianum*), Black-eyed Susan (*Rudbeckia hirta*), False Sunflower (*Heliopsis helianthoides*), Bush Clover (*Lespedeza* sp.), Showy Tick Trefoil (*Desmodium canadense*), Horseweed (*Erigeron canadensis*), Beggars Ticks (*Bidens* sp.) and Cut-leaved Coneflower (*Rudbeckia laciniata*).

Finally, on our return we passed a large sandy pond with sunning turtles. The main plant species found included Slender-leaved Agalinis (*Agalinis tenuifolia*), Jointed Rush (*Juncus articulatus*), Variegated Horsetail (*Equisetum variegatum*) and Scouring Rush (*Equisetum hyemale*), as well as Sandbar Willow (*Salix interior*) and Heartleaf Willow (*Salix eriocephala*).

We ended the trip perusing the wine and the many lavender-related items in the gift shop, with some of us taking advantage of the cold hard cider for sale made from apples grown on the property, to refresh after the warm summer day. ✨

La Mer Bleue, si belle

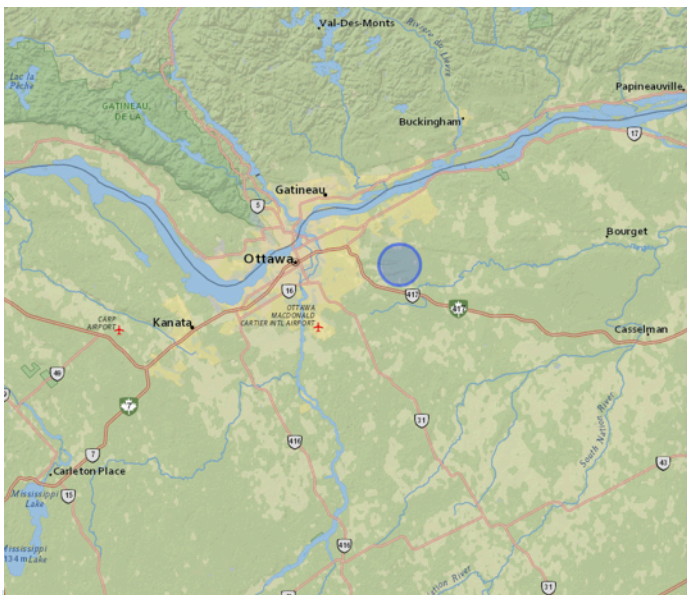
28 May, 2016

By Cassandra Robillard

The sun beat down and, for a while, the combination of tannins and heat infused our site with the smell of a steeping pot of tea.

On May 28th, during one of Ottawa’s busiest weekends, FBO members (and visitors like me) braved record heat, and little shade, to admire and learn about the flora of Mer Bleue bog. They were led by Paul Sokoloff, a botanist and Arctic researcher at the Canadian Museum of Nature. Our walk took us from a narrow cattail marsh strip out onto the bog proper, over a forested upland, and back through the Broad-leaved Cattail marsh (*Typha latifolia*) until regaining the treed high ground that led back to the trailhead.

Paul’s primary focus for the day was to highlight those plant species that are more commonly associated with remote northern environments, such as peatlands. The conifers like Tamarack (*Larix*



Mer Bleue landscape. Photo: C. Robillard.

laricina) and Black Spruce (*Picea mariana*) that dot the hummocks within peatlands, are generally rare outside of the Boreal Forest, although widespread in Hudson’s Bay Lowlands; sedges like *Carex* species and Sheathed Cotton-grass (*Eriophorum vaginatum*) are the type of flora that dominate in the Canadian tundra.

But these northern visitors were only one part of the plant diversity on display in the bog. The tiny carnivorous Round-Leaved Sundew (*Drosera rotundifolia*) was in attendance, as well as Labrador Tea (*Rhododendron groenlandicum*), and the usual suspects of the charming Heath family: Bog Laurel (*Kalmia polifolia*), Bog Rosemary (*Andromeda glaucophylla*), Leatherleaf (*Chamaedaphne calyculata*), Blueberries (*Vaccinium myrtilloides* and *V.*

corymbosum) and Cranberry (*V. oxycoccos*). These were all in various stages of flowering; the Bog Laurel was particularly striking in the first stages of bloom, its pleated flowers resembling a paper lantern of bright fuchsia when just beginning to open.

Other notable sightings included fluorescent orange mushrooms of the genus *Mirula*, carnivorous Bladderwort (*Utricularia* sp.), and what appeared to be a Lady’s Slipper (Moccasin Flower, *Cypripedium acaule*), not yet in bloom.

As with any time a group of naturalists are together, the walk participants were just as active as the host in engaging and educating others on their favourite group. Having a weak spot for mosses, I made sure to point out the three main bryophyte players on the stage that day: the stars were of course the many species of peat moss (*Sphagnum*), which can be distinguished from other moss genera by their “pom-pom”- like heads of many small branch buds, surrounded by a star-shaped corona of longer, thinner branches, and below which extends a long stalk adorned with clusters of hanging branchlets the whole way down.

Dwarfed by the extent of the peat, but no less noticeable, were Neon Moss (*Aulacomnium*), so-named because of the vibrant spring-green colour of new shoots, and the tall,

needle-leaved Common Hair-Cap moss (*Polytrichum commune*).

There were many more species spotted that I’ve listed below. Paul Sokoloff has also written a colourful summary of the trip, with photos, at the Canadian Museum of Nature’s Blog: <https://canadianmuseumofnature.wordpress.com/2016/06/08/northern-plants-in-the-capital-mer-bleue-bog/> ✨

Some species spotted in Mer Bleue:

- Labrador Tea - *Rhododendron groenlandicum*
- Black Spruce - *Picea mariana*
- Bog Laurel - *Kalmia polifolia*



Branch of Tamarack (*Larix laricina*) with young cones. Photo: C. Robillard.

Highbush Blueberry - *Vaccinium corymbosum*
 Small Cranberry - *Vaccinium oxycoccos*
 Sheathed Cotton-grass - *Eriophorum vaginatum*
 Bog Rosemary - *Andromeda glaucophylla*
 Common Hair-cap Moss - *Polytrichum commune*
 Tamarack - *Larix laricina*
 Sulphur Cinquefoil - *Potentilla recta*
 Orthotrichum Moss - *Orthotrichum* sp.
 Black Huckleberry - *Gaylussacia baccata*
 Heart-leaved Foam-flower - *Tiarella cordifolia*
 Baneberry - *Actaea* sp.
 Woodsy Mnium Moss - *Plagiomnium* sp.
 Common Greenshield Lichen - *Flavoparmelia caperata*
 Cinnamon Fern - *Osmundastrum cinnamomeum*
 Royal Fern - *Osmunda regalis*
 Marsh Horsetail - *Equisetum palustre*
 Moccasin Flower - *Cypripedium acaule*

Graminoids on the Beaverton River

9 July, 2016

By Jessica Consiglio

On an overcast but warm Saturday morning, approximately fifteen FBO members gathered for the Wetland Grasses and Sedges Trip at the Beaver River trailhead, located south of Blackwater, Ontario. Led by Steve Varga, Inventory Biologist with the Ministry of Natural Resources and Forestry (MNRF), our group explored the Beaver River along a gravel trail which followed the footprint of an abandoned railway line traversing through the provincially significant Beaver River Wetland Complex.

The trip began with a brief introduction to grass and sedge morphology, accompanied by some sketches to help familiarize everyone with typical vegetative and reproductive structures. Steve also passed around handouts to the group which contained identification information on wetland sedges, rushes, bulrushes, and grasses. He briefly explained some of the differences between grasses and sedges, such as the difference in flower structure, but also noted that as a general guideline: sedges (of the *Carex* genus) typically have a three-sided stem, while grasses typically have a rounded and often hollow stem.

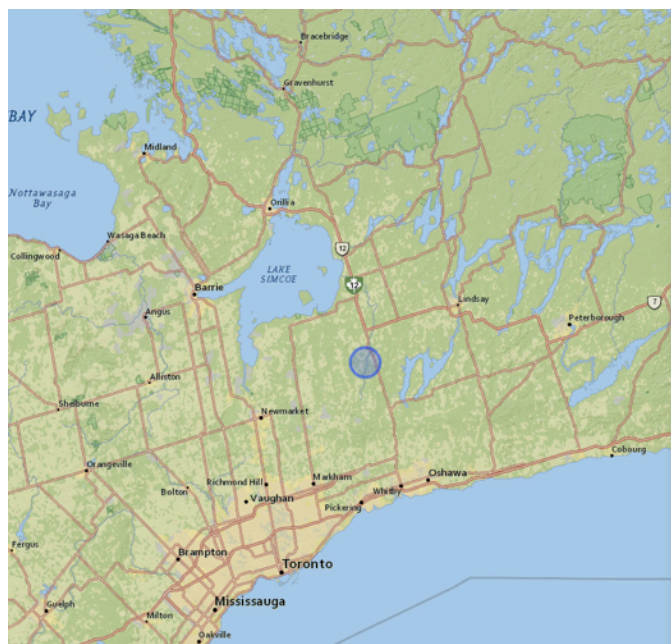
Heading south along the rail trail, our group immediately discovered a variety of graminoids growing alongside the trail, as well as in the surrounding marsh not more than five metres from the parking area. Likely due to the area's proximity to Durham Regional Road 13 and

Broad-leaved Cattail - *Typha latifolia*
 Leatherleaf - *Chamaedaphne calyculata*
 Neon Moss - *Aulacomnium* sp.
 Peat Moss - *Sphagnum* sp.
 Round-leaved Sundew - *Drosera rotundifolia*
 Bladderwort - *Utricularia* sp.
 Black Chokeberry - *Aronia melanocarpa*
 Bulbous Water Hemlock - *Cicuta bulbifera*
 Spotted Jewel-weed - *Impatiens capensis*
 Few-seeded Sedge - *Carex oligosperma*
 Coast Sedge - *Carex exilis*
 White Meadowsweet - *Spiraea alba*
 Tomentose Meadowsweet - *Spiraea tomentosa*
 Fringed Loosestrife - *Lysimachia ciliata*
 Velvet-leaved Blueberry - *Vaccinium myrtilloides*

the presence of the rail trail, we observed several non-native upland grass species including: Awnless Brome (*Bromus inermis*), Quack Grass (*Elymus repens*), Timothy (*Phleum pratense* ssp. *pratense*), Canada Bluegrass (*Poa compressa*), and Kentucky Bluegrass (*Poa pratensis* ssp. *pratensis*), which is generally considered to be introduced.

Moving along the rail trail and farther into the marsh, we observed our first wetland grasses: Bluejoint Reedgrass (*Calamagrostis canadensis* var. *canadensis*), Reed-canary Grass (*Phalaris arundinacea*) and Red-top (*Agrostis gigantea*). The first sedge species observed on the trip was Lake-bank Sedge (*Carex lacustris*), which Steve mentioned could easily be identified by the presence of fibrous sheaths at its base and leaves with a 'w' shape in cross-section. Along this segment of the trail at the edge of the marsh, Cypress-like Sedge (*Carex pseudocyperus*) was also observed, and Steve brought to our attention its distinctly robust stems, long perigynium with spreading teeth and bifid (two cleft) beak.

As we hiked off of the rail trail and began traversing the marsh, Steve noted that water levels were unseasonably low due to the lack of rain



this summer, although standing water still remained throughout. Our next wetland grass discovery was Tall Fescue (*Schedonorus arundinaceus*, previously *Festuca arundinacea*), which was easily identified by its unevenly sized glumes and rounded lemmas. Moving into a maple swamp adjacent to the rail trail as it began to rain, we added several more wetland grasses to our list, including Fowl Manna Grass (*Glyceria striata*) growing on a hummock alongside Swamp Bluegrass (*Poa palustris*). Like many other bluegrass (*Poa*) species, swamp blue grass was identified by the presence of cobwebby hairs, but was also distinguished by its keeled glumes and long ligules.

Continuing through the swamp, Steve identified Slender Wedge Grass (*Sphenopholis intermedia*), which is an uncommon wetland grass with a provincial rank of S4S5. This species was quite memorable due to its narrow head and unevenly sized glumes. Our next discovery was Awl-fruited Sedge (*Carex stipata*), immediately recognizable by its wrinkled sheath and fleshy stem. We also encountered Crested Sedge (*Carex cristatella*), Bog Panicked Sedge (*Carex diandra*), and Prairie Sedge (*Carex prairea*) before breaking for lunch.

Due to the area's high diversity of graminoids, the group had travelled less



Sphenopholis intermedia (top) and *Schedonorus arundinaceus* (bottom). Photo: J. Consiglio.

than a kilometer by noon, so after lunch we headed north along the trail from Durham Regional Road 13 and followed the rail trail along a complex of mixed deciduous treed swamp and thicket swamp hoping to find more sedge species. As we exited the trail into the swamp, Graceful Sedge (*Carex gracillima*) was quickly identified by its red base and drooping spikes, and Steve explained that it was easily distinguished from the similar Drooping Wood Sedge (*Carex arctata*) by its beakless perigynia.

Continuing into the swamp, several clumps of Inland Sedge (*Carex interior*) and Bristle-stalked Sedge (*Carex leptalea*) were found alongside the more robust Bladder Sedge (*Carex intumescens*). Hiking deeper into the swamp didn't reveal any new species, so the group headed back to the rail trail. The final species we encountered was Black Bulrush (*Scirpus atrovirens*) which is easily distinguished from similar bulrush species, such as Red-sheathed Bulrush (*Scirpus microcarpus*.) by its entirely green leaf sheaths and septate lower leaf sheaths.

With nine sedge (*Carex*) species, one bulrush species, and twelve grass species found, we called it a day and headed back to the rail trail. Although no regionally or provincially rare species were seen, we were fortunate to observe so many common wetland species growing close together. In addition to graminoids, Marsh Bellflower (*Campanula aparinooides*) was also found in flower at the time of our visit, and our group encountered several Green Frogs (*Lithobates clamitans*) and Northern Leopard Frogs (*Lithobates pipiens*) along the way. Despite the initially overcast sky and rainy forecast, it was still an interesting and highly informative trip. Many thanks to Steve for sharing his wealth of knowledge and experience with us! ✨

GTA “Mystery Tour”, revealed

6 August, 2016

By Pat Deacon

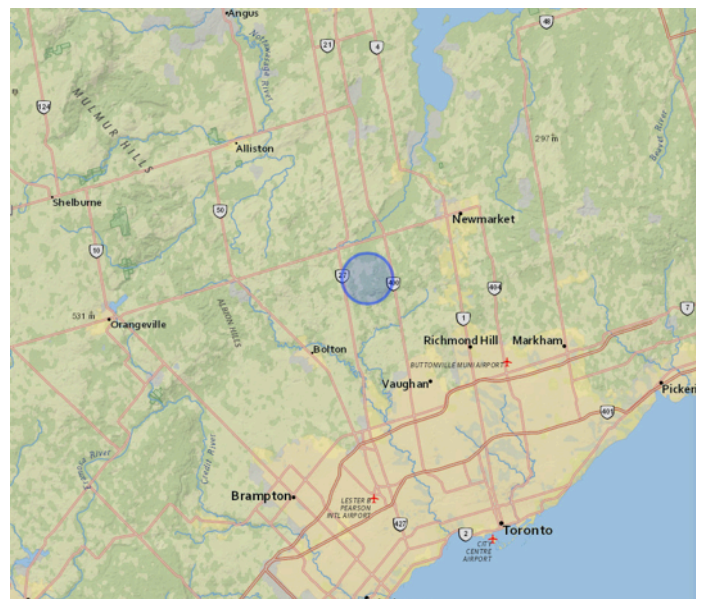
A group of keen field botanists gathered in the Happy Valley Forest on August 6, 2016 to explore a property recently acquired by the Nature Conservancy of Canada (NCC). Putting our eyes and botanical knowledge to work, our goal for the day was to compile a list of vascular flora for the property.

I had offered to stand in as a representative of the FBO Executive for the day. Assembling in a circle at a cul-de-sac, I proceeded to take a head count, provide an introduction for our trip leader Steve Varga and ask the dreaded question “Do I have any volunteers to write up a trip report?”. All eyes began to scour the gravelly roadside intently,

botanizing like never before, perhaps trying to find the first record of Narrow-leaved Vervain (*Verbena simplex*) for York Region among the road shoulder gravel. You could hear a pin (cherry) drop. One trip participant did look me in the eyes to deliver an assured “No”.

The day started with the prerequisite ditch botany; banks blanketed in Large-leaved Aster (*Eurybia macrophylla*) as well as patches of the non-native Coltsfoot (*Tussilago farfara*). Coltsfoot was used historically for its medicinal properties, which gave way to the tradename Robitussin – derived from the genus *Tussilago*.

The group proceeded into an area of dry-mesic forest dominated by Sugar Maple (*Acer saccharum*) with Black Cherry (*Prunus serotina*) and White Ash (*Fraxinus americana*) also present. Most of the rolling upland forest we observed on the trip was mid-age and approaching mature in some areas where large Sugar Maple, Red Oak (*Quercus rubra*) and American Beech (*Fagus grandifolia*) towered above us. The shrub layer offered views of Maple-leaved Viburnum (*Viburnum acerifolium*) and Beaked Hazel (*Corylus cornuta*).



The fleshy red fruits of Canada Fly-honeysuckle (*Lonicera canadensis*) could be found dangling beneath the branches. Steve noted that we should watch for Hairy Honeysuckle (*L. hirsuta*), differentiated by its 1-2 connate leaves below the inflorescence and twining growth form (Michigan Flora Online 2011); however none were located that day. Several multi-stemmed Witch Hazel (*Hamamelis virginiana*) arched their branches over our heads. A close look revealed the clumpy fruits and buds that would soon produce the gangly-looking neon yellow flowers.

The dark green leaves of Fringed Milkwort (*Polygala paucifolia*) lined the trail and would have added a splash of pink to the groundcover in late spring. The leaves and dried culms of Rough-

leaved Mountain Rice (*Oryzopsis asperifolia*) were spotted along the path and were present through much of the forest. Tall White Rattlesnake-root (*Prenanthes altissima*) was pointed out followed by a discussion of the defining traits of the species in comparison to White Rattlesnake-root (*P. alba*). Generally, *P. alba* has 6-8 inner phyllaries and 8-12 florets per head, whereas *P. altissima* has 4-5 inner phyllaries and usually 5 florets per head (Michigan Flora Online 2011).



Equisetum scirpoides. Photo: P. Deacon.

Although peak upland sedge season had passed us by, we were still able to identify Rosy Sedge (*Carex rosea*) with its recurved styles, Peck's Sedge (*C. peckii*), Long-stalked Sedge (*C. pedunculata*) and Finely-nerved Sedge (*C. leptoneuria*). Steve noted that Finely-nerved Sedge is more common in the northern part of the Greater Toronto Area while Woodland Sedge (*C. blanda*) is more common in the south.

We descended a gentle slope into a seepage-fed White Cedar (*Thuja occidentalis*) swamp with a groundcover dominated by Sensitive Fern (*Onoclea sensibilis*) and a variety of wetland sedges. Not far beyond the wetland a narrow meandering channel formed, which transported the cool water northward eventually flowing into the Pottageville Swamp. The site sits at the uppermost reach of the West Holland River sub-watershed, a part of the Lake Simcoe Watershed (LSRCA 2008).

Adding to our list of graminoids, Purple False Melic (*Schizachne purpurascens*) grew at the periphery of the swamp while Rice Cutgrass (*Leersia oryzoides*) was common throughout the saturated substrates (you only wade through a stand of Rice Cutgrass in shorts once!). Porcupine Sedge (*Carex hystercina*) was fairly abundant in this pocket of swamp and is differentiated from the similar Cyperus-like Sedge (*C. pseudocyperus*) by perigynia teeth which are softer to the touch (Arsenault et al. 2013). Cyperus-like Sedge is also generally later to mature. Mexican Muhly (*Muhlenbergia mexicana*), Small Forget-me-not (*Myosotis laxa*) and Smooth-sheathed Sedge (*Carex laevivaginata*) occurred sparingly here. Smooth-sheathed Sedge can be differentiated from Awl-fruited Sedge (*C. stipata*) by the sheath (smooth versus the wrinkled sheath of Awl-fruited Sedge) as well as the length of the perigynia beaks (notably longer in Smooth-sheathed Sedge) (Michigan Flora Online 2011).

Delicate forbs including Northern Water Horehound (*Lycopus uniflorus*), Spotted Jewelweed (*Impatiens capensis*), Bulblet Bladder Fern (*Cystopteris bulbifera*) and the seepage indicator Lesser Clearweed (*Pilea fontana*) grew in the spaces between tufts of sedges and grasses. A single White Spruce (*Picea glauca*) sapling grew in the swamp which harbours a north-facing micro climate

providing refuge to this more northern species.

As we departed from the wetland to an oak-dominated slope Steve mentioned that we should watch for American Cancerroot (*Conopholis americana*) – a species which is parasitic on oak roots. Our search was soon distracted by stands of Indian Tobacco (*Lobelia inflata*) growing along the edges of a trail as it often does. A couple of young stems of European Swallowwort (*Cynanchum rossicum*) were found and subsequently pulled out. It's scary to see this aggressive invader pop up in a more or less intact natural habitat.

We briefly examined a patch of Eurasian Woodland Bluegrass (*Poa nemoralis*) alongside Canada Bluegrass (*P. compressa*), the latter having the lower portion of the culm flattened, growing in the same vicinity in smaller numbers. Eurasian Woodland Bluegrass can become somewhat invasive in forest ground layers.

After enjoying lunch among a grove of American Beech of varying age we ventured through a sizable swamp feature. Here, two

graminoid species were added to our list; Drooping Woodreed (*Cinna latifolia*) and Wood Millet (*Milium effusum*). As our aerial map suggested, the canopy clearing we approached was a massive (0.75ha) excavated pond, presumably pre-dating the provincial regulation intended to protect wetlands from development.

Back up a forested slope we ticked boxes for American Hog Peanut (*Amphicarpaea bracteata*), Patridgeberry (*Mitchella repens*) and Northern Bush-honeysuckle (*Diervilla lonicera*). Barren Strawberry (*Geum fragarioides*), no longer falling under the fun-to-say genus *Waldsteinia*, was pointed out among the leaf litter. The trifoliate leaves of this species resemble those of a strawberry however the plant has golden yellow flowers as opposed to the white flowers of, say, Wild Strawberry (*Fragaria virginiana*).

Ascending another forested slope we emerged into a sandy, south-facing opening. A couple of American Copper (*Lycaena phlaeas*) butterflies darted among flowers; their larval foodplants include various Dock species (*Rumex* spp.). The pocked remnants of a past horticultural venture were apparent; likely something more illicit than Grandma's tomato patch.

Despite the limited precipitation received in the last while, a number of clumps of Linear-leaved Panic-grass (*Dichanthelium linearifolium*) were well-established and fruiting. This species is found in dry, sandy forests and dunes, especially in disturbed areas and clearings (Michigan Flora Online 2011).

The group examined the deeply cut leaves and elongated seed heads of Long-headed Anemone (*Anemone cylindrica*); a species also at home in this sandy open habitat. The similar Tall Anemone (*A. virginiana*) was also present, with seed heads which are shorter and more plump than those of Long-headed Anemone.

After a good look through the hand lens and considering the arid habitat we were in, an unfamiliar sedge was determined to be Umbellate Sedge (*Carex umbellata*); a new species for many on the trip. One identifying feature of this species is the presence of pistillate spikes on very short culms, essentially hidden among the base of the plant (Michigan Flora Online 2011). Michigan Flora also notes that this species is more of a calciphile than the similar Deep-green Sedge (*C. tonsa*), which shares the feature of pistillate spikes on very short culms but has slightly longer perigynia and perigynia beaks.

Nearby, a few Low False Bindweed (*Calystegia spithamea* ssp. *spithamea*) were spotted. While most bindweed species in Ontario are annuals which spiral their way up the stems of adjacent vegetation, this species is generally 'stand-alone' and is also known as Erect Bindweed. This forest opening proved to be a rarity haven

with the above-mentioned species (except Tall Anemone), all rare in the GTA (Varga 2000).

Moving toward the rear of the lot, patches of Dewey's Sedge (*Carex deweyana*) could be found on crests within the upland forest. I find the Michigan Flora description well-written in noting that the pistillate scales of this sedge are "very pale and translucent, giving a characteristic silvery appearance to the inflorescence" (Michigan Flora Online 2011). The sedge is named after American botanist and *Carex* expert Chester Dewey (1784-1867).



Dichanthelium linearifolium. Photo: P. Deacon.

A small patch of the regionally rare Hickey's Tree-clubmoss (*Dendrolycopodium hickeyi*) was noted growing on an upland ridge of well-drained soils and added another species to our list of fern allies for the day, which included Field Horsetail (*Equisetum arvense*), Dwarf Scouring-rush (*E. scirpoides*) and Common Scouring-rush (*E. hyemale*). Nestled on the bank of a deep road cut along the forested right-of-way we found a few fronds of Mackay's Brittle Fern (*Cystopteris tenuis*).

Checking out one more wetland we encountered Slender Wedgegrass (*Sphenopholis intermedia*), a cool season graminoid which is uncommon in York Region (Varga 2000). The very rare Shiny Wedgegrass (*S. nitida*), a species of dry forests, differs in that the lemmas are scabrous on the sides (versus smooth) and the awns 1-2mm in length (versus 0.2-1mm) (Barkworth et al. 2007).

Among the dense swath of Common Scouring-rush Steve located a clump of Red-tinged Bulrush (*Scirpus microcarpus*), a plant some refer to as Barberpole Bulrush in reference to the alternating red and green culm. Despite spending much of the day in wetlands we

encountered our first fronds of Marsh Fern (*Thelypteris palustris*) – a common pteridophyte of marshes and swamps. The regionally rare Dyer’s Bedstraw (*Galium tinctorium*) was spotted buried among the Scouring-rush. This obligate wetland species resembles Three-petalled Bedstraw (*G. trifidum*) but the latter has longer pedicels which curve at maturity (as opposed to pedicels less than 8mm in length and remaining relatively straight) (Michigan Flora Online 2011). Both species have three petals.

A short hike along a grassy riparian trail led us back to our vehicles where we wrapped up the day. Our thanks to Steve for leading another fun and informative outing and to the NCC for allowing us to explore the property for the day. ✨

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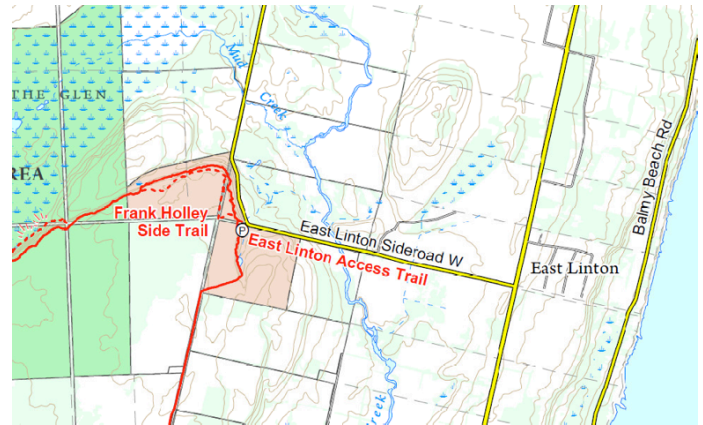
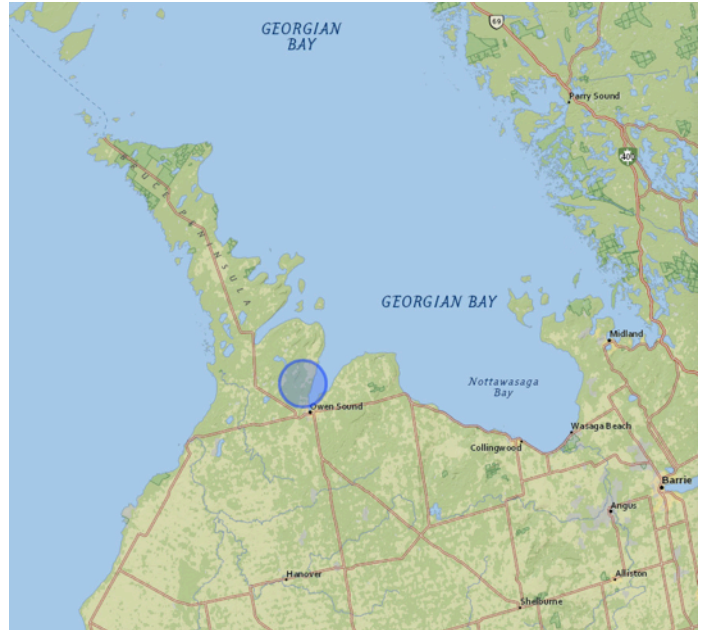
Fern Plethora of the Glen

13 August, 2016

By Paul Eagles

The morning portion of this field trip was held in the Fossil Glen Forest owned by the Bruce Trail Conservancy (see detailed map).

The field trip had 14 attendees, plus the two excellent leaders in Tristan Knight and Tyler Miller. The day was mild, but it rained throughout, including heavy rain at lunch. The attendees handled the rain quite well, but it was hard on digital cameras and paper note books.



In the morning, the group hiked and explored along a Niagara Escarpment outcrop of limestone under a deciduous forest. The site is excellent for ferns and fern allies. Highlights included: Hart’s-tongue Fern (*Asplenium scolopendrium* var. *americanum*), Walking Fern (*Asplenium rhizophyllum*), Narrow-leaved Glade Fern (*Homalosorus pycnocarpus*), and Steller’s Rockbrake (*Cryptogramma stelleri*). Other fern species included: Marginal Shield Fern (*Dryopteris marginalis*), Northern Holly Fern (*Polystichum lonchitis*), Common Polypody (*Polypodium virginianum*), McKay’s Brittle Fern (*Cystopteris tenuis*), Male Fern (*Dryopteris filix-mas*), Maidenhair Spleenwort (*Asplenium trichomanes*), Maidenhair Fern (*Adiantum pedatum*) and Goldie’s Wood Fern (*Dryopteris goldiana*).

In the afternoon, the group entered onto one of Grey Sauble Conservation Authority properties. The habitat was a Freeman’s Maple (*Acer x freemanii*) deciduous treed swamp, dominated by ephemeral open pools and herbaceous ground cover.



Robert Eagles presents Goldie's Wood Fern (*Dryopteris goldiana*). Photo: P. Eagles.

Hart's-tongue Fern (*Asplenium scolopendrium*). Photo: P. Eagles.

The group was reminded of the excellent local book produced by the Owen Sound Field Naturalists, "*The Ferns of Grey and Bruce*". The book can be purchased at Ginger Press Books at 848 Second Avenue East in downtown Owen Sound. ✨

The following is a complete list of ferns found on the trip:

Morning hike on limestone outcrops

- | | |
|---|--|
| <i>Cystopteris fragilis</i> | Fragile Fern |
| <i>Polypodium virginianum</i> | Rock Polypody
Evergreen Wood Fern |
| <i>Dryopteris intermedia</i> | |
| <i>Dryopteris marginalis</i> | Marginal Wood Fern
Narrow-leaved Glade Fern |
| <i>Homalosorus pycnocarpus</i> | |
| <i>Polystichum lonchitis</i> | Northern Holly Fern |
| <i>Asplenium scolopendrium</i> var. <i>americanum</i> | Hart's-tongue Fern |
| <i>Cryptogramma stelleri</i> | Steller's Rockbrake |
| <i>Matteuccia struthiopteris</i> | Ostrich Fern
Northern Maidenhair Fern |
| <i>Adiantum pedatum</i> | |
| <i>Cystopteris bulbifera</i> | Bulblet Fern |
| <i>Dryopteris goldiana</i> | Goldie's Wood Fern |
| <i>Asplenium rhizophyllum</i> | Walking Fern
Maidenhair
Spleenwort |
| <i>Asplenium trichomanes</i> | |
| <i>Dryopteris carthusiana</i> | Spinulose Wood Fern |
| <i>Cystopteris tenuis</i> | Mackay's Brittle Fern |
| <i>Dryopteris filix-mas</i> | Male Fern |

Afternoon hike in maple swamp

- | | |
|---|---|
| <i>Dryopteris cristata</i> | Crested Wood Fern |
| <i>Athyrium filix-femina</i> var. <i>angustum</i> | Northeastern Lady Fern |
| <i>Dryopteris carthusiana</i> | Spinulose Wood Fern |
| <i>Osmunda regalis</i> | Royal Fern |
| <i>Onoclea sensibilis</i> | Sensitive Fern |
| <i>Thelypteris palustris</i> | Eastern Marsh Fern |
| <i>Matteuccia struthiopteris</i> | Ostrich Fern |
| <i>Gymnocarpium dryopteris</i> | Common Oak Fern
Northern Maidenhair Fern |
| <i>Adiantum pedatum</i> | |
| <i>Osmundastrum cinnamomeum</i> | Cinnamon Fern |

Miniature Smoky Mountains in Spooky Hollow Sanctuary

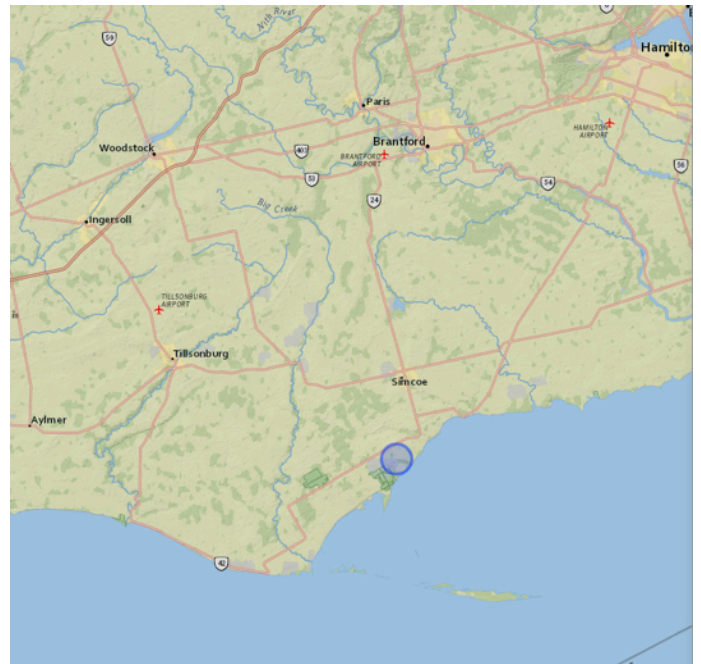
10 September, 2016

By Will Van Hemessen

(with minor additions, CZ, from Chris Zoladeski)

Saturday's hike at Spooky Hollow in Norfolk County was led by Will Van Hemessen, a terrestrial ecologist with Parsons Inc. in London, Ontario.

Despite the torrential rain in the morning we started the day in good spirits and our enthusiasm paid off since the rain ended just before we set out on our hike. Spooky Hollow is a beautiful place in any weather but it was especially atmospheric immediately after the morning's rain. We began our walk by following the Marion Shivas Trail which forms a loop to the west of the main trail. The group was immediately amazed at the height of the canopy in this part of the forest (the sheltered aspect of the south-facing ravine allows the trees to grow exceptionally tall) and an old-growth Black Cherry (*Prunus serotina*) was the subject of many "wows". But the main highlights along this trail were the large number of mature American Chestnuts (*Castanea dentata*). Many of these trees appeared surprisingly vigorous and healthy, although the largest ones were evidently affected by the blight. One individual was producing fruit—a rare sight in Ontario. Unfortunately, as one of our



group members pointed out, the fruits contained no viable seeds. As a final highlight of this side trail we found four species of dogwoods growing in next to each other: Eastern Flowering Dogwood (*Cornus florida*), Round-leaved Dogwood (*Cornus rugosa*), Grey Dogwood (*Cornus racemosa*), and Alternate-leaf Dogwood (*Cornus alternifolia*).

Other interesting species that we encountered included Yellow Mandarin (*Prosartes lanuginosa*, or *Disporum lanuginosum*), Interrupted Fern (*Osmunda claytoniana*), Canada Horse-balm (*Collinsonia canadensis*), Bearded Short-husk (*Brachyelytrum erectum*), Prickly Sedge (*Carex echinata*), and Large Tick-trefoil (*Hylodesmum*, or *Desmodium glutinosum*). At the top of the trail loop, several Oriental Bittersweet (*Celastrus orbiculatus*), covered with abundant fruits, twined on shrubs in a small opening, where the native Grey Dogwood (*Cornus foemina*) bravely fought for space with the non-native Multiflora Rosa (*Rosa multiflora*). cz

After lunch, we first followed the Hemlock Loop Trail in order to explore the swampy ravine bottom. This is where we made our most exciting discovery of the day: Schreber's Aster (*Eurybia schreberi*), a provincially rare (S2S3) species closely related to Large-leaved Aster (*E. macrophylla*). Schreber's Aster can be distinguished from the more common Large-leaved Aster by the long, white rays and the lack of gland-tipped hairs on the stem. We found a population of Large-leaved Aster later in the day and observed that the glandular hairs on the stem were clearly visible to the naked eye, further confirming that our earlier discovery was indeed Schreber's Aster.



Ready to be spooked! Photo: B. Kowalyk.

The swampy ravine bottom in Spooky Hollow is a truly wonderful spot both aesthetically and botanically. A clear, sandy-bottomed stream flows between old-growth Eastern Hemlocks (*Tsuga canadensis*) and Eastern White Cedars (*Thuja occidentalis*). The groundcover layer is thick with mosses and liverworts and contains



Schreber's Aster (*Eurybia schreberi*). Photo: B. Kowalyk.

an interesting assemblage of vascular plants including Blue Lobelia (*Lobelia siphilitica*), Roundleaf Goldenrod (*Solidago patula*), Goldthread (*Coptis trifolia*), and Plantain-leaved Sedge (*Carex plataginea*) among many others. An awesome sight towards the end of the Hemlock Loop was the discovery of a massive Leatherwood (*Dirca palustris*), estimated to be about 4m tall!

Large areas of the creek floodplain were essentially totally covered by a carpet of Dwarf Scouring-rush (*Equisetum scirpoides*) and American Hog-Peanut (*Amphicarpaea bracteata*). In the muck soil of large seeps we saw Large-leaved Avens (*Geum macrophyllum*), Dwarf Clearweed (*Pilea pumila*) and Naked Mitrewort (*Mitella nuda*). cz

We finished our walk in an old White Pine (*Pinus strobus*) plantation at the northern end of the property where we hoped to find Ebony

Spleenwort (*Asplenium platyneuron*). Finding it was more challenging than expected but after finally locating one plant many more began to appear. Ebony Spleenwort was just one of many fern species we identified on the property and many in our group expressed amazement at the diversity of ferns at this location. Other ferns included:

- Maidenhair fern (*Adiantum pedatum*)
- Lady Fern (*Athyrium filix-femina*)
- Hay-scented Fern (*Dennstaedtia punctilobula*)
- Intermediate Wood Fern (*Dryopteris intermedia*)
- Spinulose Wood Fern (*Dryopteris carthusiana*)
- Sensitive Fern (*Onoclea sensibilis*)
- Royal Fern (*Osmunda regalis*)
- Cinnamon Fern (*Osmundastrum cinnamomeum*)
- Christmas Fern (*Polystichum acrostichoides*)

Considering the weather at the outset, the day turned out to be incredibly successful. Many thanks to all who came out! ✨

Botanical roots

The influence of soil homogenization on early successional plant communities, ecosystem properties and resilience during tallgrass prairie restoration

Research Article by Holly Stover, PhD Candidate, Western University

(Supervisor: Dr. Hugh Henry)

A central theme in ecology is determining factors controlling species diversity and the influence of species diversity on the functioning and resilience of ecosystems to stress. Ecological theory can be tested in ecological restoration projects, such as the widespread establishment of native grassland on former croplands. In grassland restoration projects, a diverse range of species is typically sown to maximize plant species diversity. However, the legacy of tillage in these former croplands results in substantial homogenization of the topsoil, where soil properties (e.g., organic matter, nutrients) become more



Photo taken after research plots were installed and seeded in June 2015 in the former agricultural field. Erosion matting was laid down over plots to prevent seed loss from rainfall.

uniform as a result of tillage, erosion and compaction. The question remains as to what extent this soil spatial homogeneity limits plant species diversity at these sites. Plant diversity is often greater in sites with more complex soils where species sort into separate distinct patches of soil, based on their differences in adaptability to different resource levels. Additionally, the edge or transition zone between patches may act as a small scale ecological transition zone and further increase diversity but this has not been tested. Very little research has considered how this relates to plant community-driven ecosystem level properties and resilience to stress.

My PhD project aims to explore if adding distinct patches of soil containing sand, woodchips and topographic variation where the soil has been homogenized from tillage can increase plant diversity in a tallgrass prairie restoration. I am comparing soils with added patches of sand and woodchips to soils where sand and woodchips have been added and mixed into the surrounding substrate and soils with hummocks and hollows to level-tilled topsoil to mimic homogenization from cropland tillage to see if plant diversity is higher in non-homogenized soils. At the ecosystem level, I am comparing these two types of soils to see if plant biomass production, decomposition and nitrogen retention (an indicator of nutrient cycling) are also lower in homogenized soils. I am exposing the soils to frost stress by performing snow removal during winter. Snow cover provides an insulating layer protecting soil from freezing during winter, and snow removal was chosen to select an important stress that may increase due to climate change. I am testing if more complex soils with added patches of sand and woodchips are more resilient (have higher plant diversity and rates of the above mentioned ecosystem properties) when exposed to frost stress compared to homogenized soils.



Photo taken four months later in October 2015 from a similar viewpoint (same Bur Oak in background) showing establishment of early successional vegetation on site including Green Foxtail and the changes in the ecosystem where research plots were located.

The field site for my PhD research was established in May 2015 at Environmental Sciences Western Field Station within a tallgrass prairie restoration research site on former cropland (12 acres, London clay loam soil). The tallgrass prairie restoration was planted by Dr. Henry's laboratory including Mathis Natvik in spring 2015 (see photo). To date, we have planted seeds from over 51 graminoid and forb species native to southern Ontario. Seed was either donated, purchased or we collected it from the wild and processed it at the university greenhouse. For seed collection and cleaning we collaborated with Daria Koscinski from Thames Talbot Land Trust, sharing seed for different restoration projects that they are involved in.

Results to date are still forthcoming for the ecosystem properties and resilience experiments but preliminary data are available for the plant communities. In the first two years of succession (2015-2016), overall plant communities and species diversity were relatively uniform across the field and in homogeneous and heterogeneous treatment plots. However, plots with sand had higher native grass and forb species richness than the other plots. Canopy cover of *Verbena stricta* (Hoary Vervain) was higher in edge habitats between soil patches, indicating this species may prefer these areas. Indicator species analysis suggested *Pycnanthemum virginianum* (Virginia Mountain Mint) was most common in sand patches and *Plantago major* (Common Plantain) in hollows. Therefore, species sorting and plant community patterns may be influenced by soil homogenization at the level of functional groups.

Vegetation and species composition in the restoration currently resemble that of an old field in early ecological succession with large patches of bare ground and a sparse litter layer. The legacy of cultivation is still evident in the plow furrows, corn stover and

soybean residues still present. The dominant vegetation reaches a maximum of about two metres in height at the peak of the growing season in the fertile clay soil and includes common adventive species such as asters and goldenrods, clovers, Canada Thistle (*Cirsium arvense*) and sow thistles (*Sonchus* spp.). Prairie grasses are beginning to establish including Indian Grass (*Sorghastrum nutans*), Big Bluestem (*Andropogon gerardii*) and Little Bluestem (*Schizachyrium scoparium*). Other common native species that have established from seed include Evening Primrose (*Oenothera biennis*), Early Goldenrod (*Solidago juncea*), Gray Goldenrod (*Solidago nemoralis*) and Slender Wheatgrass (*Elymus trachycaulus*). It is a struggle to get all native species to establish and a small fraction of the seed planted germinates in the harsh, competitive environment (although for some it is likely that it is just more time that is needed). Species that have not yet established include Michigan Lily (*Lilium michiganense*), Butterfly Weed (*Asclepias tuberosa*) and Sideoats Grama (*Bouteloua curtipendula*), with this past growing season's drought not helping matters. Sundial Lupine (*Lupinus perennis*) and Slender Blazing Star (*Liatris cylindracea*) will germinate readily but do not survive past winter, likely in need of sandier soils. Early spring (April) 2016 was a spectacle to behold as the site remained bare for several weeks with the exception of a dense blanket of dandelions, which were outcompeted and died back later in the season. As succession proceeds we are seeing many changes. Facilitative species like Red-root Amaranth (*Amaranthus retroflexus*) and Green Foxtail (*Setaria viridis*) are being shaded out and replaced by other species, like goldenrods and asters.

Ultimately, this research project will help determine if soil homogenization negatively influences restoration of diverse plant communities on former croplands in Ontario. It will also identify if addition of human-created soil patches could aid attempts to restore grassland. Addressing the greater implications beyond plant community and diversity effects, it is one of the first initiatives to test if soil homogenization influences plant productivity, nitrogen retention, decomposition and response to soil freezing.

The research was made possible by Mary Gartshore who donated native plant seed and provided expert advice, donation of woody material from Gro-Bark for preliminary trials and the generous support from many student bursaries including the 2016 FBO Student Award, a Vanier Canada Graduate Scholarship (NSERC), and a grant from Western Research. We are also grateful to the many undergraduate students who volunteered to help with the restoration.

I would like to thank the Field Botanists of Ontario for their support of this research including the opportunity to present a poster at the 2016 AGM and write this article for the newsletter. It was a great experience discussing the project with FBO members at the 2016

AGM, sharing stories about the experiment including “interesting” wildlife encounters, the research methods, how the plots were installed and seeded and what species have established from seed to date.

2016 John Goldie Award

By W.D. McIlveen

On September 10, 2016, the tenth annual John Goldie Award was presented to Dr. James Phipps at the FBO AGM held at the Backus Heritage Conservation Area. The award was given in recognition of his contribution to field botany in Ontario. For all of his work, primarily on the genus *Crataegus*, Jim is another highly deserving recipient.

Jim, a “transplant” from England, is a native of Birmingham, where he graduated from the university, to go to British East Africa as a botanist in the 1950s. There, he began his studies on the grasses in the Arundinelleae. He was then hired by the University of Western Ontario as a Lecturer in the Department of Plant Sciences in the early 1960s. This position, with support from university and the National Research Council of Canada, allowed him to continue



FBO President Dan Westerhof (left) presents Goldie Award to beaming Jim Phipps. Photo: B. McIlveen.

fieldwork in Africa and Madagascar. He was then able to continue his graduate studies and obtained his Ph.D. degree at UWO in 1969. At the time, he was applying the principles of numerical taxonomy to grass systematics. From this, he was able to publish not less than 18 papers on the taxonomy of African grasses.

Later, he shifted his focus to hawthorns, a difficult group for which we know him best. Initially, he worked on the genus *Crataegus* in Ontario. Along with Dr. M. Munniyama he concluded, in a monograph published in 1980, that there were 39 'good' species in the genus in the province. Although there have been more recent treatments in which some of these names have changed, this was a great improvement in the then known occurrence of hawthorn in Ontario. Along with Dr. Munniyama, Jim was able to prove that suspected apomixis was happening in *Crataegus*. In additional papers, they reported on ploidy level and embryological variation in the genus.

Through the late 1970s and the 1980s, Jim guided a series of graduate students in studies of Ontario hawthorns. The list included Q. P. Sinnott (*C. series Pruinosae*); T.A. Dickinson (*C. series Crusgalli*); P.G. Smith (*C. series Rotundifoliae*); P.F. Ulf-Hansen (population dynamics); and T.C. Wells (hybridization). Jim continued his own work on hawthorn biogeography and taxonomy.

The study of hawthorns took Jim to other parts of North America. This included a great deal of work in southeastern United States, western North America, and even northern Mexico. These studies were ideal in that they provided the necessary background information that allowed Jim to complete the comprehensive treatment of *Crataegus* for the Flora of North America (FNA), a treatment that included 169 species, on 153 pages! All through this period, Jim had many collaborators, including Ken Robertson of the Illinois Natural History Survey, Bob O'Kennon, Ron Lance, Al Schotz, Angus Gholson Jr., and Theodore Palmer. The collaboration and individual study resulted in dozens of papers on hawthorns. In 2003, along with Bob O'Kennon and Ron Lance, Jim published a book on Hawthorns and Medlars (a related genus *Mespilus*).

At the University of Western Ontario, Jim was the director of the Sherwood Fox Arboretum which encompassed all of the landscape plantings on the University grounds. In addition to being Professor of Plant Sciences, he was Curator of the Herbarium at UWO. Under his guidance, the collection grew from 12,000 specimens to about 50,000 of which about 20% were *Crataegus* and other Rosaceae. But the collection outgrew its allotted space. As a consequence, in 2008, a large part of the *Crataegus* research collection was transferred to the Royal Ontario Museum thanks to the support from the Louise Hawley Stone Charitable Trust, NSERC support of Tim Dickinson's research, and other ROM resources. Jim retired in 2000 but remains active in his research projects.

In addition to his own research which resulted in the publication of

over 70 papers on the hawthorns, Jim contributed to the Flora of North America as an editor for Volumes 3 (included Fagaceae) and Volume 22 (included Juncaceae). During his tenure as President of the Canadian Botanical Association in 1982, he was able to support and encourage the FNA from its beginnings.

Jim was known as a demanding but supportive supervisor who encouraged independent thinking in his students. In return, he was able to learn from them and to appreciate their contributions to science and his own studies. The combined efforts of Jim, his colleagues, and his students are therefore integral to the long-term benefit of those interested in botany. The Field Botanists of Ontario is therefore pleased to present the John Goldie Award for 2016 to Jim Phipps.

(Many thanks are extended to Tim Dickinson of the Royal Ontario Museum for his contributions of information included in this article.)

August 12, 2016

To: The President and Members, Field Botanists of Ontario

**Financial Review (Unaudited)
Field Botanists of Ontario**

I have reviewed the financial statements and books of record of the Field Botanists of Ontario, as prepared by your Treasurer Bill Draper, for the year ending 31 December 2015.

In the course of this review, I examined the bank statements, bank deposit records, donated cheques, board expenses and all receipts.

My conclusion is that the accounts balance with the bank statements and are properly described in the Revenues and Expense Statement for 2014. All questions arising from my review have been explained by the Treasurer to my complete satisfaction.

I have verified the accounts and am satisfied that the statements as presented do accurately reflect the financial position of the Club for the year ending 31 December 2014.

Some members may have concerns about maintaining a ~\$20,000. surplus. In my view, this is appropriate measure as some of this money can then be dedicated toward a project of interest and value to Ontario field botanists. Examples would be assisting in the production of Ontario-wide and regional floras or subsidizing a workshop / symposium on Ontario field botany.

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