

S P R I N G 2 0 1 5

FIELD BOTANISTS OF ONTARIO

NEWSLETTER

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President's Message

If, like me, you started out your working life as a zoologist, or if you lack formal training in biology, or you've forgotten the training you once had, you may find it helpful to get back to the basics of botany. There are several textbook-style references available for study in libraries; the best I found was "Plant Systematics: a Phylogenetic Approach", by Judd et al. (2008), but earlier texts such as "Taxonomy of Flowering Plants" by Porter (1967) are still useful. There are also lecture notes from several university plant systematics courses available free of charge on-line that you may find interesting and informative. Books or courses on systematic botany can open up your world to include families that are not represented in Ontario. For example the *Arecaceae*, or *Palm Family*, and the *Bromeliaceae*, or *Bromeliad Family*, are important in tropical to warm temperate regions, but not in the native flora of Ontario.

I'm not suggesting that we all need to memorize floral formulae for each family, but an understanding of the characters separating the major taxonomic groups and the key attributes of families can go a long way to aiding recognition of unknown plants in the field. For example, Canada Yew (*Taxus canadensis*), the only native Ontario species of the Family *Taxaceae*, can easily be separated, when mature, from most other conifers since its seeds are borne in a bright-coloured fleshy covering rather than in a cone (Gleason and Cronquist 1991). Regional floras are also a good source of information on the basic characteristic of families of plants.

A basic knowledge of the descriptive terminology of structures and shapes in botany is also required if you are to get beyond non-technical field guides and use the dichotomous keys found in virtually every regional flora, such as the "Field Manual of Michigan Flora" (Voss and Reznicek 2012), or the many volumes of the "Flora of North America" project. Familiarity with some basic terms describing the location and shape of male and female flowers of sedges is essential to identify the many species of this family group, the *Cyperaceae*.

I know many of our members have delved deeply into these topics and will find this description rudimentary. Others who are refreshing their knowledge of the basics, or just beginning to explore the fascinating realm of botany, will, I hope, find it a useful entry point.

Mike McMurtry

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On the cover: Photo collage, NCC property. Top right: Maidenhair Spleenwort (*Asplenium trichomanes*) and Green Spleenwort (*A. viride*) cohabitating in grike; lower right: Lakeside Daisy (*Tetaneuris herbacea*); left: Dwarf Lake Iris (*Iris lacustris*). Photos by Tyler Miller and Jenna McGuire. Bottom: Spotted Wintergreen (*Chimaphila umbellata*). Photo by Rod Lee.

Sidebar artwork: Fringed Gentian (*Gentianopsis crinita*).

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

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

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Editor's Note

The flora of an area can be deemed as diverse by either being rich in species, containing several rare or unusual plants, or by a combination of these two parameters. An example of the first is the report by Simon Grafe, from a trip to the Madawaska Highlands. It centred on the sedges, the largest genus in Ontario, although of course other plants were also noted. The sharp eyes of the participants, directed to specific locations by Eleanor Thomson, spotted more than three dozen species of sedges. This is a proof that when one is highly focused, even at locations that are not renowned as biodiversity hotspots, surveys can be very rewarding.

The second situation, and perhaps also the third one at the same time, is that of Bruce Peninsula. Jenna McGuire and Tyler Miller report on the multitude of species, both rare and common, encountered during a trip to FON and NCC properties, wonderfully illustrated by their photographs.

Dave Jolly's report from the AGM trip to the Black Oak Heritage Park in Windsor, on the other hand, lists almost exclusively the rarities observed there. A companion to his account of the Windsor savanna could be the report by Pat Deacon on that other rare vegetation type in Ontario - tallgrass prairie. In that article, Pat takes you on a fall tour through the various habitats and species of the Branchton prairie remnants.

Reading our newsletters over the past several years you may have noticed that more and more contributors use the new, "official" names of species and genera (although the editors are lenient and flexible in this area and "permit" the old taxonomy). Thus, you can still say *Aster* (a pretty historical name), instead of *Symphotrichum* (a not so beautiful linguistic oddity, albeit descriptive in its Latin meaning), or have it the other way around. As it is always the case, young botanists at the beginning of their career will grow up with the new taxonomy and may not even know the old synonyms, but the mature (a polite euphemism for "old") folks will probably always prefer the "classic" nomenclature. Carolus Linnaeus would most certainly not recognize many of his original proposals but the taxonomic tumult caused by molecular genetics is ongoing on several levels, with changes to names (and ranking) of not just species and genera, but also families. If you are frustrated by the extent and speed of these changes, we are with you, and so is Bill McIlveen. His article documents just a small sliver of the scope of the convulsions. Enjoy, or go mad, or both.

Chris Zoladeski

Field Trip Reports

Sedges of the Madawaska Highlands

21 June, 2014

By Simon Gräfe

Eleanor Thomson led a trip to learn to recognize sedges (*Carex* spp.), found in the Madawaska Highlands, by shape, size and other clues. The Madawaska Highlands is part of the Canadian Shield, which can be quite rocky with lots of hills and valleys, so we planned to visit both upland and wetland habitats on Eleanor's property. We found 27 species of *Carex* and separated them mainly based on characteristics of the perigynia, but also on basal sheaths and leaf width

Sedges (Cyperaceae) are one of the three families of grasslike plants found in Ontario, the other two being grasses (Poaceae) and rushes (Juncaceae). Shoots and leaves are perhaps the easiest way to tell the families apart from a distance; shoots of most sedges (especially the genus *Carex*) are triangular in cross-section and have leaves coming off each of the three sides (i.e. leaves are three-ranked), while rushes have round shoots with three-ranked leaves, and grasses are round with nodes and two-ranked leaves (Hipp 2008). For the rest of this report, I'll use the term sedge to refer to the genus *Carex* specifically. Sedges are interesting plants for three reasons: first, there are a lot of them (248 species in Ontario), more than any other vascular plant genus in the province (NHIC 2014); second, they occur in and are indicative of a wide variety of habitats; third, sedges are pretty to look at, especially if you get close to examine their flowers (in spikelets) and perigynia (sacs surrounding the female flowers/fruit; Hipp 2008).

The lowlands surrounding the Madawaska Highlands include Lake Nipissing and the Ottawa Valley to the north and east, and the Lake Simcoe and Trent River lowlands to the west and south. Southern Ontario's other two highlands are the Grey County Highlands bordered by the Niagara Escarpment and the Huron Highlands north of Lake Nipissing and west of the Ottawa Valley and Lake Timiskaming (Tovell 1970).

Our trip began at 10:00 am on a pleasant, sunny day in front of Eleanor's cabin. Including Eleanor, there were seven of us on the trip. The laneway to the cabin was a fair drive off the main road and combined with the lack of neighbours and Eleanor's desire to have a cellphone-free sanctuary, I really had the feeling of being far from any sign of civilization. With such a large area to explore, we decided to head downhill towards a beaver pond in the morning, and then after lunch to follow a stream through a mix of forest and open wetlands.

The hill leading from Eleanor's cabin to the beaver pond was rocky and covered with lichens. A particularly interesting lichen was British Soldier Lichen (*Cladonia cristatella*), so named because its bright red colour resembles the soldiers' past uniforms.

At the base of the hill we found ourselves looking across the beaver pond. Out in the open, there were lots of birds singing and a few Mink Frogs calling. Much of the pond was vegetated, mostly with Woolly-fruit Sedge (*Carex lasiocarpa*) and Water Horsetail (*Equisetum fluviatile*), but there was still plenty of open water in the centre. A canoe was lying on its side near us and we were told that we could canoe across the pond if we wanted; however, the canoe had been patched from a bear chewing holes in it, so it was at our own risk! No one took up the offer of a canoe trip so instead we waded around the edge of the pond looking for sedges the rest of the morning.

After lunch in Eleanor's pleasantly cool cabin, we spent the afternoon hiking along a stream passing through forest, a sedge marsh and another beaver pond. Some of the species called out in the marsh included: common Woolly Bulrush (*Scirpus cyperinus*), Soft Rush (*Juncus effusus*), Common Spikerush (*Eleocharis palustris* [= *E. smallii*]), Northern Beaked Sedge (*Carex utriculata*) and Cyperus-like Sedge (*Carex pseudocyperus*). The afternoon's beaver pond was much smaller than what we saw in the morning, but had a beaver lodge nearby! We stopped for a time waiting to see if a beaver would come out and were rewarded when a pair swam across the pond. As we watched the beavers, a number of courting damselflies also flew by, along with a larger dragonfly (maybe a Four-spotted Skimmer?), while a Green Frog called out in the distance. Our presence was too much for a Chickadee nesting in the pond, however; who perched nearby and scolded us to leave. We left the beaver pond and began to return to the cabin; however we couldn't resist one last detour and headed down a hill to see the Early Coralroot Orchid (*Corallorhiza trifida*).

By the end of the day, we had hiked through forests and around ponds in a beautiful part of the Canadian Shield. All this time, we had also been comparing sedges and had seen at least 27 species (see below)! Thanks again to Eleanor for a great trip! 🌱

Carex list

The main features we looked for to separate sedges were the perigynia (e.g., presence of hair or a beak, number and size, position and angle against the stem); however, additional important features were the basal sheath's colour or texture (e.g., red, fibrillose or corrugated/wrinkled) and the leaves' width.

Rocky hill

C. deweyana (sect. *Deweyanae*), Dewey's Sedge. We were told that the culm (stem) droops, possibly for ants to disperse the achenes (fruit).

C. arctata (sect. *Hymenochlaenae*), Drooping Woodland Sedge. A small sedge with a red base.

C. pedunculata (sect. *Clandestinae* [= *Digitatae*]), Long-stalked Sedge. Another sedge with a very red base, but this one has leaves that are parallel up to their tip. This and the next sedge are part of the peachfuzz wood sedges (i.e. hairy perigynia) (Hipp 2008).

C. lucorum (sect. *Acrocystis* [= *Montanae*]), Forest Sedge. Look for a large beak on the perigynia (> 1 mm).

Beaver ponds and sedge marsh

Section *Ceratocystis* [= *Extensae*]. *C. flava* (Yellow Sedge) differs from *C. cryptolepis* (Northeastern Sedge) by having wider leaves, conspicuous scales covering the perigynium and tiny teeth on the perigynium beak.

Section *Phacocystis* [= *Acutae*]. *C. stricta* (Tussock Sedge) and *C. aquatilis* (Water Sedge). Both are tussocky sedges. Distinguishing features are fibrillose basal sheaths with ladder-

like threads (*C. stricta*) and perigynia with small "nubbins" of hair and a darker blue colour (*C. aquatilis*).

Section *Vesicariae*. *C. utriculata* (Northern Beaked Sedge) differs from *C. vesicaria* (Inflated Sedge) by being rhizomatous (vs. clumped), a more robust plant and having perigynia spreading more than 90° from the culm (vs. not spreading from the culm). In the afternoon, we also saw *C. pseudocyperus* (Cyperus-like Sedge). These and the next two sedges are part of the bladder & bottlebrush sedges, characterized by inflated, "bladder-like" perigynia, spikelets with many perigynia resembling a bottlebrush, or both features (Hipp 2008).

Section *Paludosae*. *C. lacustris* (Lake Sedge) and *C. lasiocarpa* (Woolly-fruit Sedge). Compared to *C. utriculata* above, *C. lacustris* was even bigger, with wider leaves bent in the shape of a "W".

Path along a stream through a forest

C. intumescens (sect. *Lupulinae*), Bladder Sedge. Another bladder & bottlebrush sedge. This one has fat perigynia at the tip of the culm (stem).

C. crinita (sect. *Phacocystis* [= sect. *Cryptocarpaceae*]), Fringed Sedge. A sedge with huge perigynia!

C. echinata (sect. *Stellulatae*), Star Sedge. A sedge with a large clum and a star-like spikelet.

C. disperma (sect. *Dispermae*), Two-seeded Sedge. Only one or two perigynia per spikelet, the perigynia are round like a broom handle.

Section *Glareosae* [= *Heleonastes*, *Canascentes*]. *C. trisperma* (Three-seeded Sedge), *C. brunnescens* (Brownish Sedge) and *C. canescens* (Hoary Sedge) seemed to differ by how many perigynia were on the spikelet (from few to many, respectively).

C. stipata (sect. *Vulpinae*), Awl-fruited Sedge. The leaf sheaths of this sedge are corrugated/wrinkled and the culm is fat and bends easily.

Section *Acrocystis* [= *Montanae*]. *C. communis* (Fibrous-root Sedge) and *C. pensylvanica* (Pennsylvania Sedge). Two more peachfuzz wood sedges. *C. communis* leaves are quite wide (> 3 mm), while *C. pensylvanica* has a shorter perigynia beak than *C. lucorum* (< 1 mm).

C. projecta (sect. *Ovales*), Necklace Sedge. The perigynia are flat in spikelets resembling small balls. Also look at the leaf width (3-7 mm), which is large for sect. *Ovales*.

Wet area at the bottom of a hill

C. scoparia (sect. *Ovales*), Pointed Broom Sedge.

C. leptalea (sect. *Leptocephalae* [= *Polytrichoideae*]), Bristle-stalked Sedge. A sedge with only three to four beakless perigynia.

C. retrorsa (sect. *Vesicariae*), Retrorse Sedge. Another bladder & bottlebrush sedge. The lower perigynia on the spikelet point down (i.e. they're reflexed or "retrorse").

C. flava (sect. *Ceratocystis* [= *Extensae*]), Yellow Sedge. A second sighting, we saw this sedge earlier in the beaver pond.

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Sanctuary of the Northern Bruce Peninsula

14 June, 2014

By Jenna McGuire and Tyler Miller

With fresh and matured eyes of a returning local after many years, I never truly experienced the unique sanctuary of the Northern Bruce

Peninsula as I have this summer with all it has to hold and teach. As the plants along the with people became revitalized from the extended winter a late spring botany trip was all that was needed to shake off the lingering cold. Joan Crowe and Barbara Palmer lead approximately a dozen FBO members to a handful of interior and coastal locations on the North Bruce Peninsula.

The initial botany sauntering began at a Nature Conservancy of Canada (NCC) property at the north-east corner of Highway 6 and Dyer Bay Road

and progressed to a more extensive yet similar habitat type at the adjacent Federation of Ontario Naturalists (FON) Bruce Alvar Nature Reserve to the north-west across Highway 6. Bruce Alvar Nature Reserve was purchased in 1993 using funds from a generous donation from Catherine S. Wishart, who wanted to protect a property containing rare and endangered plants. Both the NCC property and Bruce Alvar reserve are classic examples of pavement alvars, with extremely flat soilless expanses of rock patched with successional stands of stunted Jack Pine (*Pinus banksiana*) and White Cedar (*Thuja occidentalis*). Alvars like this are the result of glacial scouring, kilometre-thick sheets of ice moving across the landscape removing soil, exposing the Silurian dolomitic limestone bedrock. The crystalline nature of limestone is such that it fractures in linear cracks and after thousands of years of karstic (water dissolving rock) erosion, the cracks have augmented into larger grikes which intersect the landscape. These grikes are critical in alvar habitats like this, as they often contain soil and are the first areas of colonization for vegetative species. Additionally, they provide some shade and moisture protection for more delicate species like ferns.

Not ten metres off the parking lot at the NCC property intriguing finds started to occur: Balsam Groundsel (*Packera paupercula* var. *paupercula*), Seneca Snakeroot (*Polygala senega*), Scarlet Indian-paintbrush (*Castilleja coccinea*) and Buxbaum's Sedge (*Carex buxbaumii*) were a few of the plant species of note. The group weaved around a large historical split rail cedar fence and not soon after we began to walk upon multiple grikes that held some unique fern species. One six foot deep grike in particular caught the group's eye. After both of us (Jenna and Tyler) climbed down to investigate, we were able to confirm Maidenhair Spleenwort (*Asplenium trichomanes*) and Green Spleenwort (*Asplenium viride*) growing together for a perfect comparison and photo opportunity. Also among the grikes, many Fragile Ferns (*Cystopteris fragilis*) were growing. Joan Crowe also noted earlier in the trip that this location held a



Balancing act on the Bruce Alvar boardwalk. Photo: T. Miller and J. McGuire.

historical record of Mackay's Fragile Fern (*Cystopteris tenuis*), although the group did not find it.

Topside on the exposed alvar pavement the group was drawn to scattered deposits of shallow soils, with small, vegetated oases. Heavy focus was given to identifying a low, white five-petalled, opposite-leaved flowering plant that turned out to be Michaux's Stitchwort (*Minuartia michauxii*). Also growing on these small oases was Virginia Saxifrage (*Micranthes virginensis*), and the minute plant that you generally identify via smell before sight (once the plant is crushed beneath your feet), Low Calamint (*Clinopodium arkansanum*).

On route to the Bruce Alvar via the highway roadside, trail and onto the constructed boardwalk that preserves the delicate ecosystem beneath, the group observed Golden-fruited Sedge (*Carex aurea*) with its perigynia beginning to mature into the colourful orange that brings a nutty flavour once mature, Shrubby Cinquefoil (*Dasiphora fruticosa*) and Alderleaf Buckthorn (*Rhamnus alnifolia*). Once into the core area of the Bruce alvar we began to see the more famous species such as the provincially rare and Great Lakes endemic Dwarf Lake Iris (*Iris lacustris*) growing in dense, short, rhizomatic patches and Lakeside Daisy (*Tetraneris herbacea*) of which a high percent of the world population occurs primarily on the North Bruce Peninsula in such alvar habitat. Just two feet off the boardwalk the group came across a locally common yet provincially rare snake initially identified and noted by its distinct alarm sound, the Eastern Massasauga Rattlesnake (*Sistrurus catenatus*); two specimens in fact, minding their own under a small stand of White Cedar trees, a perfect distance to get a close yet safe look at.

After lunch at Barbra's place (complete with coastal Lake Huron views) the group rallied themselves to continue the day at the ecologically rare and diverse Singing Sands, Dorcas Bay. Singing Sands was originally zoned for cottage development but purchased in the 1960s by the Federation of Ontario Naturalists, who recognized its botanical significance. It is indeed one of the most promising areas on the Bruce Peninsula for botanical excursions as it houses many species within its multiple habitats. As seen in our visit to the alvars,

evidence of glacial action abounds. Longitudinal north-facing scours mark the beach, and there are a number of erratic boulder beaches, the boulders made of foreign igneous rocks carried from the north by glacial action. After glaciation, several periods of high and low water left evidence of old shorelines along the Bruce Peninsula. The sand dunes are evidence of such ancient lake shores. The dunes and rocky shoreline meet with coniferous forest, alvar and a coastal meadow marsh as well, a true mosaic of habitats. Ground water and cool springs seep over the shoreline, creating excellent microhabitats for clusters of plants. The rounded sand grains used to make a humming noise when strong winds occurred. Now, the sands no longer "sing", as the installation of the parking lot in the 1970s and vegetative succession have changed the landscape of the sand expanse significantly.



Top right: Insectivorous *Drosera linearis*; bottom right: Insectivorous *Pinguicula vulgaris*; left: provincially rare *Cyripedium arietinum*. Photo: T. Miller and J. McGuire.

Walking on a boardwalk cutting into a fen we observed a suite of stellar and interesting plants growing out of the saturated silty sand substrate, such as the provincially rare Tuberous Indian-plantain (*Arnoglossum plantagineum*), Richardson's Sedge (*Carex richardsonii*), and Sterile Sedge (*Carex sterilis*) with its confusing habit of having the male and female parts sometimes on the same plant, yet

sometimes occurring separately on individual plants. There was also a unique yellow form of the Scarlet Indian-paintbrush (*Castilleja coccinea*), Canada Bluets (*Houstonia canadensis*), Carolina Grass-of-parnassus (*Parnassia glauca*), Mucronate Blue-eyed-grass (*Sisyrinchium mucronatum*) and a Sand Cherry species (*Prunus pumila*) which, interestingly enough, turns out to have three varieties that are present in Ontario, one of which being provincially rare.

The group was readily ushered off the boardwalk to the north trail of Dorcas Bay leading toward Pendall Point, with the intent to observe as much as possible during the remainder of the day. We ventured upon the basal leaves of the provincially rare Hill's Thistle (*Cirsium hillii*) growing on the elevated bank of a vegetated sand dune, partially exposed to trail disturbance. With regard to this species' habitat preference, I have observed it multiple times this season and, anecdotally, it appears that Hill's Thistle thrives in disturbed/open sites.

As a unit, not far from the beginning of the trail, we stepped off to gaze at the spectacle of a yet another provincially rare plant, the Ram's-head Lady's-slipper (*Cypripedium arietinum*), which was in perfect flower condition (and this particular patch held approximately a dozen individuals). During this time Jenna delivered to a few of us a beautiful description of the pollination process in the slipper orchids, where pollinators are coerced into leaving through the "back-door" of the orchid, getting a mass of pollinia stuck to their abdomens. And not long after that description we actually saw the process in action, where a little bee spent about two minutes trying to find its way out of the pesky Ram's-head flowers. While a large majority of the group remained to soak up the orchids, some of the more energetic people unintentionally split off and continued onward toward the point. The species that we found growing out of the extremely shallow, sandy soil along the shoreline have some of the most interesting biophysical adaptations, as observed in a tri-ad of insectivorous plants: Slender-leaved Sundew (*Drosera linearis*), Common Butterwort (*Pinguicula vulgaris*) and Northern Pitcher-plant (*Sarracenia purpurea*), the latter species seen earlier along the boardwalk. Other species of interest were Common Bog Arrow-grass (*Triglochin maritima*), Tufted Club-rush (*Trichophorum cespitosum*), Common Three-square Bulrush (*Schoenoplectus pungens*), Marsh Mermaid-weed (*Proserpinaca palustris*), Bird's-eye Primrose (*Primula mistassinica*) and, believed to be the provincially rare, Lake Huron Single-spike Sedge (*Carex scirpoidea* ssp. *convoluta*). The specimen that the group specifically inspected was not confirmed, although *Carex scirpoidea* has been confirmed along the same shoreline by a collection that an associate of mine found the day prior to the trip. According to the Natural Heritage Information Centre (NHIC, 2013), *Carex scirpoidea* ssp. *convoluta* is "a Great Lakes endemic confined primarily to alvars and shorelines around Lake Huron. Known only from Ontario and Michigan, with most of its global populations in Ontario".

The botanizing at the three sites throughout the day truly showcased the unique ecology and rare and interesting species contained within the sanctuary of the Northern Bruce Peninsula. These factors combined with trekking around with like-minded people granted us satisfaction as day drew to a close. And thank you to Joan Crowe and Barbra Palmer for organizing – it was an excellent area to host an FBO trip. 🌱

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Sensory Botany in the Black Oak Heritage Park

6 September, 2014

By Dave Jolly

One of the FBO field trips offered during the Annual General Meeting was to the gorgeous Black Oak Heritage Park, in Windsor. It was well attended. We also had the honour of having Bill Crowley, past FBO President, with us. The trip began with a discussion on the history of the Ojibway Nature Park properties and surrounding areas, including encroachment by neighbours. Our trip leader, Karen Cedar, eloquently explained the Black Oak savannah and surrounding landscape to a captive audience. Black Oak savannah habitats in Ontario have experienced a significant decline over the past 100 years. Like our prized Tallgrass prairie communities, it is estimated that only 1% of Black Oak savannah remain in Ontario, largely due to habitat loss from development and agricultural practices.

Of special interest to participants were the majestic and stately large Black Oaks (*Quercus velutina*), seen upon entering the Heritage Park. Some oaks appeared to reach heights of approximately 30 meters and may have been 200–300 years old. We were greeted by an open field of Tall Thoroughwort (*Eupatorium altissimum*) before entering the Black Oak woodland. As we approached, other rare plants emerged. Overall, we observed eight nationally and provincially rare species: federally and provincially endangered Spotted Wintergreen (*Chimaphila maculata*), federally and provincially special concern Shumard Oak (*Quercus shumardii*), provincially rare Tall Thoroughwort, Virginia Culver's-root



Eupatorium altissimum. Photo: D. Jolly.



Lespedeza virginica. Photo: R. Lee.

(*Veronicastrum virginicum*), federally and provincially endangered Slender Bush-clover (*Lespedeza virginica*), Pin Oak (*Quercus palustris*), Purple Joe-pye-weed (*Eupatorium purpureum*) and Tall Ironweed (*Vernonia gigantea*). Common plants growing with these rarities were Great Lobelia (*Lobelia silphilitica*), Arrowed-leaved Aster (*Symphotrichium urophyllum*) and Rough Woodland Sunflower (*Helianthus divaricatus*). Unusual mushrooms such as Collared Earthstar (*Geastrum triplex*) dotted the path along the route as we explored.

For lunch, the group headed to the Ojibway Nature Centre where we sat in tiny kindergarten-sized chairs and discussed some of our highlights from the morning... (That brought back fond memories for me of the time when I was in kindergarten and played hockey in the woods of Cavendish Park at the end of my grandmother's street in London, Ontario. We almost felt like we were also skipping classes and having too much fun with the toys.)

After lunch our goals switched to locating Ontario's newest Spotted Wintergreen record on the hiking trails of the Nature Centre. A new Ecological Land Classification vegetation type for this species may also be added for recovery efforts. As we went around a bend in the trail our eyes riveted toward seven plants that stood out like emerald beacons against the woodland floor. We marvelled at how these plants got here since the closest population is 268 km east of Ojibway Nature Park, in the Turkey Point area. We surmised that a bird must have eaten a seed pod at Turkey Point, flown to Ojibway and defecated there. (I had a similar theory, but it didn't involve a bird and doesn't conform to the Ontario Ministry of Natural Resources Recovery Strategy explanation of seed dispersal.)

The day ended spectacularly with a visit to the Purple Joe-pye-weed patch. We used our noses to help find it since the flowers of this species give a distinctive vanilla scent, like Spotted Joe-pye-weed (*Eupatorium maculatum*). Our eyes and noses were rewarded when we found the patch.

A big heartfelt thank you is extended to Karen for making this trip unforgettable and fun. 🌱

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🌿 Botanical roots 🌿

A fall hike through the Branchton prairie remnants

By Pat Deacon

(This article was originally published in the October edition of the Tallgrass Ontario Bluestem Banner newsletter. To learn more about tallgrass prairie in Ontario or to become a member please visit: <http://www.tallgrassontario.org/>)

As any prairie enthusiast can attest, fall is a great time to explore and enjoy tallgrass prairie. Having recently taken a stroll down my favourite length of abandoned railbed I thought I would share my accounts of this and other trips to the Branchton prairie remnants; the place where I first discovered tallgrass prairie.

I have always found the steep slopes of the Grand River above the railbed at the Waynco prairie to be especially vibrant at this time of year. The slope is dominated by the alternating red-green stems of Big Bluestem (*Andropogon gerardii*) and the shining inflorescences of Indian Grass (*Sorghastrum nutans*) dotting the hillside. The tufts of Little Bluestem (*Schizachyrium scoparium*), which dominate the driest rocky portions of the slope, are beginning to go to seed blanketing the hillside in white.

The railbed, which undoubtedly played a large role in maintaining Waynco prairie and much of the larger Branchton prairie remnant, was constructed in the mid 1850s. The Great Western Railway, as it was then known, opened between Galt (south end of Cambridge) and Harrisburg (northeast of Brantford) in 1854. This section of the

rail line was abandoned in 1986 and today Smooth Green Snakes (*Ophedrys vernalis*) bask and Snapping Turtles (*Chelydra serpentina*) lay their eggs among the ballast that once rattled under the weight of passenger and freight trains passing through.

In September and October the Branchton prairies and adjacent forests boast nearly 15 species of asters and goldenrods, including expanses of Sky Blue Aster (*Symphiotrichum oolentangiense*), interspersed with Smooth Aster (*Symphiotrichum laeve*), Heath Aster (*Symphiotrichum ericoides*), New England Aster (*Symphiotrichum novae-angliae*), Early Goldenrod (*Solidago juncea*) and Grey Goldenrod (*Solidago nemoralis*). I tend to walk very carefully through the bobbing horizon of yellow, white and purple blooms, which are weighed down by the diversity of nectaring bees.

Heading south down the railbed you pass by a small Tallgrass Ontario sign with Burnie the Badger exclaiming what makes this place significant. You soon cross a rail tie bridge set atop beautiful stone masonry footings (several more of these driveway and watercourse overpasses still remain farther south). The crossings allow a few (lucky) residents access from Highway 24, beneath the rail line, to their secluded home in the prairie.

A Union Gas pipeline that crosses the Grand River south of Cambridge also runs through the Branchton prairie is conducive to maintaining open pipeline right-of-ways where Big Bluestem and Sky Blue Aster thrive. Several tree species along this portion of the Grand River are indicative of Carolinian forest reaching into the south end of Waterloo Region. Along the Highway 24 right-of-way a suckering mass of Sassafras (*Sassafras albidum*) hangs on beneath the hydro wires and large Sycamore (*Platanus occidentalis*), can be found on the river floodplain. Northern Pin Oak (also known as Hill's Oak, *Quercus ellipsoidalis*), Pignut Hickory (*Carya glabra*) and American Chestnut (*Castanea dentata*) can be found in some of the well-drained forests and woodlands in the area and many of the rural roadsides throughout North Dumfries Township are lined with large Northern Pin Oak. Given the limited number of times I have encountered young specimens of the latter species, it is quite possible that it may have some dependence on fire for regeneration. Of course, fire on the landscape has been limited since Adrian Marlett's 1816 survey of Dumfries Township noted oak plains, meadows and tracts of burnt land between Galt and St. George.

South of the Waynco prairie the railbed makes a marked change of course, likely to navigate the complex topography of the Galt Moraine. This change in direction certainly wasn't charted to avoid wetlands as the railway passes dead centre through a large cattail



Prescribed burn at Waynco. Photo: P. Deacon.

marsh which has been home to a pair of nesting, albeit territorial, Sandhill Cranes (*Grus canadensis*) for at least the past several years. The horizon to the south is comprised of a tall ridge of mixed pine-hardwood forest.

Brush removal has been conducted in an oak-hickory savanna adjacent to the rail line over the last few years. The removal of Grey Dogwood (*Cornus racemosa*) and thinning of early successional species including White Ash (*Fraxinus americana*) and Trembling Aspen (*Populus tremuloides*) led to a resurgence of forbs among a carpet of Pennsylvania Sedge (*Carex pensylvanica*). It is also worth noting that a lodge full of Beavers (*Castor canadensis*) goes a long way in opening up a canopy of poplar! In addition to the herbaceous growth, the leaf litter of Red Oak (*Quercus rubra*) and Shagbark Hickory (*Carya ovata*) helped to provide enough fuel for a slow-creeping prescribed burn in the spring of 2011. Native herbaceous vegetation, including a number of rare species, has responded positively to these efforts with increases in flowering stems and the extent of suitable habitat available. The Waterloo Stewardship Council continues its stewardship work on this site as well as at the Waynco prairie and has begun to restore a 4.5 hectare old field adjacent to the rail line.

Where the rail line bisects the marsh, prairie species have established adventively along the rail ballast including a dense population of Showy Tick-trefoil (*Desmodium canadense*). I can picture renown botanist John Goldie telling a friend all covered in tick-trefoil seeds to "bury their shirt". I wonder how long the tick-trefoil joke has been around? Perhaps he made this quip moments after placing a specimen of Hoary Puccoon (*Lithospermum canescens*) in his plant press to be sent back to England. The Hoary Puccoon that Goldie collected was new to science and was sent to

Joseph Hooker, Director at the Royal Botanical Gardens, Kew. In correspondence with Goldie, Hooker marvelled at the beauty of the plant. The population which Goldie discovered is still present today along the rail line.

Other prairie indicator species add colour and texture to the backdrop of wetlands and forests including the blue of the ever-blooming Harebell (*Campanula rotundifolia*), the whites of Heath Aster and Arrow-leaved Aster (*Symphiotrichum urophyllum*), the thick brown fronds of Round-headed Bush Clover (*Lespedeza capitata*), and the now yellowing foliage of Butterfly Milkweed (*Asclepias tuberosa*). On the stony substrates of the moraine, European Common Buckthorn (*Rhamnus cathartica*) does well and the persistent green shows late into the fall when most other trees and shrubs have lost their foliage. When I get home from my hike I'll have to sharpen a few brush saw blades and mix a jerri-can of fuel, there's work to be done! 🌱

Why biologists go mad!

By W.D. McIlveen

It is natural characteristic among humans that they wish to be able to put a name on the things with which they come into contact. That extends to the legal requirement that we each have individual names, identification papers and the like. While there is no legal requirement for similar names to be extended to other forms of biota, there are a lot of systems in place to track individual items (e.g., cattle ear tag identification numbers, implanted ID chips in pets, vehicle identification numbers). Each Canadian has a Social Insurance Number. For other things, all that is required is that the item has a name to facilitate communication about it. Where would we be if we could not talk in general terms that most people understand, that helps us distinguish differences between a corn plant, an oak tree, and a tomato? We need to be able to do more than grunt something and nod in the general direction of a particular plant that concerns us.

Botanists, like all biologists, have come to rely on the general principles of taxonomy as established by Carl Linnaeus in the mid-1700s. His work has been accepted and followed by many. Of course, it has been necessary to set up some rules that everyone needs to follow when they identify and name a species new to science. The starting point for formally naming plants is year 1753 when Linnaeus published his list of known plant species (Linnaeus 1753). For many years, the Kew Gardens in London attempted to maintain a list of all formally described species in their publication *Index Kewensis* using the Kew Rule system. Because that system had several flaws, it was recognized that a more formal method for naming plants was required. Although there had been earlier meetings, the First Botanical Congress was held in Paris in 1900. From that meeting, a new set of binding, plant-naming rules was

devised and these came into effect in 1905 with the publication of the *International Code of Botanical Nomenclature*. The Congress is held about every five or six years and various updates of the rules are made at such meetings (Nicolson 1991). In 1950, cultivated plants acquired their own separate naming code, the *International Code of Nomenclature for Cultivated Plants*, owing to the fact that so many of them were derived through intensive cross-breeding programs. The most recent congress created the *International Code of Nomenclature for algae, fungi, and plants 2012*. Until now, the species naming process has relied on morphological characters of the plants involved. This system has worked well, though occasional tweaking is needed now and then when some issue or other is identified. The system led to the various lists and floras that we have come to know and love.

The flora for a certain geographic area consists of lists of plant species that have been properly described. It is best that we don't let ourselves get tied down in the endless debate about what constitutes a species. Let us just accept that what most people would regard as valid species is a defensibly identifiable group of plants and accept that there can be some variability in appearance and that the distinction between it and similar species might be a little messy on the edges.

And so we came to a point where plant taxonomy had reached a relatively nicely organized state where we, botanists, were fairly content to work. Or so it was until the ability to measure genetic differences recognizable in the DNA came into vogue. In the last several years, the fellows with the ability to analyze and compare the DNA of different organisms have thrown some large wrenches into the nicely laid out identification schemes of plants and other organisms. Their work has demonstrated that certain groups of plants that had shown a fairly close relationship based on morphological characters were much less connected when the DNA of these same species were compared. As a result, it has been necessary to rename species (following the rules noted above) or to make changes in the groupings of plants at the family level or above. Some of these changes are outlined below along with notes on the consequences that follow from a revision in what was the established order of things. In no way does this account claim that the changes should not have been made. The unbiased DNA analysis may be rather annoying to the older members of the audience but in time we will adapt to it. We simply will have the 'joy' of working during the days when the taxonomic revisions are in full swing. In time, younger botanists will simply move along without ever having to deal with the change process (unless they delve into deep taxonomic nomenclature). They will be the beneficiaries of a system that is more systematic from an evolutionary relationship sense, an accurate system that their seniors lacked at an equivalent point in their respective careers. We should not lose sight of the fact that taxonomic revisions are going on in most other groups of organisms besides plants.

I maintain sets of names of all sorts of biota that I can use as a taxonomic reference in my extensive personal database of

observations of the natural world. One of these is a master list of vascular plant names. I thought I had kept this reasonably up to date. A few months ago, I went back over it to capture the then recent name changes and was shocked and dismayed at the scale. It more or less parallels the list of names that were included on the NHIC website but was not simply a complete duplicate. It misses some of their names and includes a few others (often horticultural) added for various reasons. Nevertheless, it does provide a general indication of the scale of recent name changes. Out of the total of 3880 names that were on the list, I found that 1413 (36%) had changes in the common name and 669 (17%) had changes in their scientific names.

About two months ago, I again checked the NHIC website to confirm some information and found that there had been further modifications. I added those changes to the list and found in the end that my list had increased to 4371 but that there were a further 1138 (26%) name changes. A good number of these late changes had returned mainly the common names to the same ones that I had had on my earlier list. Many of these changes no doubt were for the better. As one example, Virginia Waterleaf that became John's Cabbage, was changed back to the former in the recent list. Some changes were trivial. This could include the insertion or deletion of a hyphen or the insertion or deletion of a space between two words in the name. There does not appear to be total consistency in the way some names are used. For example, Rough Blazing-star (*Liatris aspera*) has a hyphen while the other Blazing Star species lack the hyphen. This is perhaps a trivial matter when it comes to common names but it is nuisance in other ways including computer searches that may or may not recognize all the variants on a name. As a result, I added a couple of columns of synonyms to my species list, one for common names and one for Latin names so I have a better chance of finding a specific name. The consequences of the taxonomic changes are many and significant. On the positive side of the ledger, plants are gradually

Table 1. Revised distribution of genera formerly in Liliaceae

Amaryllidaceae	Asparagaceae	Colchicaceae	Liliaceae	Melanthiaceae	Smilacaceae
<i>Allium</i>	<i>Asparagus</i>	<i>Colchicum</i>	<i>Clintonia</i>	<i>Anticlea</i>	<i>Smilax</i>
<i>Galanthus</i>	<i>Camassia</i>	<i>Uvularia</i>	<i>Erythronium</i>	<i>Trillium</i>	
<i>Narcissus</i>	<i>Chionodoxa</i>		<i>Lilium</i>	<i>Veratrum</i>	
	<i>Convallaria</i>		<i>Medeola</i>		
	<i>Hosta</i>		<i>Ornithogalum</i>		
	<i>Hyacinthoides</i>		<i>Prosartes</i>		
	<i>Maianthemum</i>		<i>Puschkinia</i>		
	<i>Muscari</i>		<i>Streptopus</i>		
	<i>Polygonatum</i>		<i>Tulipa</i>		
	<i>Scilla</i>				
	<i>Yucca</i>				

Table 2. Revised distribution of genera formerly in Scrophulariaceae

Linderniaceae	Orobanchaceae	Phrymaceae	Plantaginaceae	Scrophulariaceae
<i>Lindernia</i>	<i>Agalinis</i>	<i>Phryma</i>	<i>Antirrhinum</i>	<i>Limosella</i>
<i>Micranthemum</i>	<i>Aureolaria</i>	<i>Mimulus</i>	<i>Callitriche</i>	<i>Scrophularia</i>
	<i>Buchnera</i>		<i>Chaenorhinum</i>	<i>Verbascum</i>
	<i>Castilleja</i>		<i>Chelone</i>	
	<i>Conopholis</i>		<i>Collinsia</i>	
	<i>Epifagus</i>		<i>Cymbalaria</i>	
	<i>Euphrasia</i>		<i>Digitalis</i>	
	<i>Melampyrum</i>		<i>Gratiola</i>	
	<i>Odontites</i>		<i>Kickxia</i>	
	<i>Orobanche</i>		<i>Leucospora</i>	
	<i>Orthocarpus</i>		<i>Linaria</i>	
	<i>Pedicularis</i>		<i>Littorella</i>	
	<i>Rhinanthus</i>		<i>Misopates</i>	
			<i>Nuttallanthus</i>	
			<i>Penstemon</i>	
			<i>Plantago</i>	
			<i>Veronica</i>	
			<i>Veronicastrum</i>	

being arranged into more appropriate groups based on genetic chemistry methods. Some of the changes may not always appear totally rational when compared with traditional morphological characters; however, the DNA analysis is less biased than the visual appearance. Despite this, the DNA method does often confirm that the morphological analysis has been not so very bad after all. Nevertheless, this knowledge does little to reduce the frustration when changes have been discovered.

The actual consequences require that we learn a whole new taxonomic arrangement of our flora. For old timers in the field, this can require significant changes somewhat contrary to all that we have been used to. For newcomers, they may learn the new names and adapt more easily. They are still not on “easy

street” because the older literature and studies all use the older terminology. For everyone, at present, most of our cherished field guides and references are out of date, not just by a few names (both scientific and common) but in large numbers of names all at once. Clearly, new updated guides are required immediately. All or most of the keys that we use to identify species are still quite valid but the species names at the end of the dichotomous keys are the old names and thus need to be “translated” and updated. Another consequence for those that use them is the need for change in the seven-letter species ID codes. These are based on the first three or four letters of the genus and species. It is not a big deal if the Latin binomial has not changed; however, if the binomial has changed, the code letters will not match the binomial. Field recorders may have to memorize two sets of Latin names. An additional consequence of the changes is that personal or institutional records will also be out of date. It all depends on the systems that were used to record the data. Depending upon the size of the data set and the urgency for maintaining a current set of names, different data sets may or may not ever see the updates. Future users of the data will need to be vigilant about the changes in nomenclature.

One of the greatest problems caused by the changes in naming is being felt by the individuals charged with maintaining herbarium collections. Most herbaria arrange their collections by taxonomic groupings. If they want to keep to that tradition, then a lot of work would be required. That could include the need to physically move the specimens to a position appropriate to the new taxonomic arrangement (e.g. physically move genera to a new family position). Specimen ID labels on existing specimens are likely to reflect the older names while more recent specimens might well have the new names. This would result in two or possibly more names for a particular species. This might not pose a great problem for someone researching a particular group. If a herbarium is fortunate enough to have an electronic database of their specimens, the problem might also be reduced. At this time, the taxonomic upheaval is probably still ongoing so making changes now such as re-arranging cabinets might be premature.

The scale of a herbarium operation does influence the probability that the needed changes can happen any time soon. About ten years ago, Carl Rothfels kindly provided a synopsis of the herbaria in Ontario and their holdings (Rothfels 2003). The summary that he provided indicated that there were 39 large to small collections held by major institutions and individuals. Eleven institutions had collections of 25,000 or more specimens and seven of these had over 100,000 specimens. The grand total of holdings reported at that time was 2,698,000. Surely, there must have been many additions to the collections over the past 10 years. It is therefore not unreasonable to assume that the total number is approaching the three million mark. It must also be considered that staffing and resources available in herbaria required to bring about the modernization simply might not be available. Those who manage herbaria are obliged to cope with the current problem as best they can. This might be via lots of labelling and cross-referencing of the physical locations of specimens. One day, the state of chaos will

settle so it will be possible to slowly bring all collections to the same general level of organization that we had become accustomed to. A large number of taxonomic changes at the genus or species level involve reactivation of some former names. This article does not attempt to review all of the many changes at this level. Instead, a few of the interesting ones are mentioned. For example: Fireweed changes from the well-known *Epilobium angustifolium* to *Chamerion angustifolium*. Spotted Joe-Pye-weed, formerly *Eupatorium maculatum*, is now *Eurochium maculatum*. Lakeside Daisy, *Hymenoxys herbacea* is now recognized as *Tetranuris herbacea*. Labrador-tea, long known as *Ledum groenlandicum* is now *Rhododendron groenlandicum*.

More surprising than the changes in nomenclature for genus or species are the changes that have occurred at the family level. Some of these, particularly in the Liliaceae (Table 1) and the Scrophulariaceae (Table 2), represent major upheavals while others affect only a limited number of genera. Some changes now recognize a former sub-family at the full family level. The following descriptions represent many of the recent changes that have affected our flora but the writer does not claim that this is comprehensive listing. It will, however, provide a fairly good insight into the changes that have occurred in recent times.

Acer (Maples) and *Aesculus* were members of their own families, the Aceraceae and Hippocastanaceae, respectively. Now, they have been placed in the Sapindaceae. *Adoxa* (Muskroot), *Viburnums*, and *Elderberries* have been removed from the Caprifoliaceae and placed in the Family Adoxaceae. 🌱

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Larry Lebert (FBO member from Toronto) displays stoicism when confronted with taxonomic madness. Photo: B. McIlveen.

FBO Membership Renewal

This is a reminder to those that have not already renewed their membership for 2015. To those that have already sent in their membership renewals – MANY THANKS! For those that receive hard copies of newsletters or other materials, the mailing label indicates the latest calendar year for which you have paid your dues. If you are uncertain about your membership status, feel free to contact the membership chairman. Membership renewal forms are available on the FBO website.

The organization always welcomes contributions of all kinds to keep the organization running smoothly. This includes things like suggestions on how to operate more efficiently, articles for the newsletter, offers to lead outings, timely trip reports, feedback on events, your personal interests, and so. We try to accommodate as many of these things as possible. Remember it is your organization so your participation helps to make it continue.