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A Sticky Situation: *Salvia glutinosa* in Southeastern New York

by Nava Tabak



Salvia glutinosa flower, habit, and example of incursion. Photos by Nava Tabak

In the young forests of southeastern New York, invasive plants are ubiquitous and plentiful, and it is easy to be lulled into the sense that we know all our invasive plants. After all, with garlic mustard, Japanese barberry, Asiatic bittersweet, tree-of-heaven, and many others, what more could possibly compete here? And with relatively high population densities, what are the chances of a truly invasive species going undetected? Imagine my surprise then, when in the fall of 2009 I encountered a plant I did not recognize growing abundantly in the forest understory on lands near the Appalachian Trail in the town of Dover (southeastern Dutchess County). The plant was so prevalent in parts of Duell Hollow as to be dominant and nearly monotypic on the forest floor. Even with a few late flowers, I was unable initially to identify this species using the guide I carried.

Those late flowers would keep me busy over the winter as I tried to puzzle out who this plant was. With a general look similar to horsebalm (*Collinsonia canadensis*), the plant's presence in the forest was so commanding that its absence from our floras or wildflower guides was suspicious. Local field biologists and botanists had not reported seeing this plant in our region previously. Ultimately keying the plant to the genus *Salvia*, I searched for yellow-flowered *Salvias* from outside the northeast, and learned that my mystery

plant was *Salvia glutinosa*.

Salvia glutinosa is a perennial herb native to Europe and western Asia, where it grows in wooded mountainous areas. The plant grows 50–100 cm tall, has opposite, toothed leaves with hastate bases, yellow corollas with brown markings, and sticky glandular hairs on the leaves, stem, and calices (Tutin et al. 1972). As with many other species in the genus, *S. glutinosa* is used in gardening, and is known to horticulturalists as Jupiter's sage or sticky sage.

With its identity revealed, I began to search more broadly for records of this species' introduction and naturalization in the northeast. Online databases and regional flora experts had no previous records of *Salvia glutinosa* in the region. Of the three herbarium records turned up by the many herbarium curators who came to my aid, only one indicated with certainty that the plant had naturalized—a specimen from Mount Kisco in Westchester County (southeastern NY). This record described the plant as hardy, self-sowing, and distributed “high & low”; unfortunately the date on the label was unclear. By examining foreign publications and herbarium specimens from the plant's native range I learned that *S. glutinosa* can grow at elevations up to or even above 2,000 meters (Tabak 2011).

When I returned to Duell Hollow the following spring, it became



apparent that this *Salvia* presented a sticky situation, literally and figuratively. A rough survey of its occurrence revealed a near continuous patch covering approximately 20 acres on publicly and privately owned land. I found additional localities over an area of ca. 70 acres, where *S. glutinosa* grew primarily in the hardwood forest understory, but also at forest edges and on rock ledges. It emerged well ahead of forest leaf-out, and appeared to be spreading both by rhizomes and by its sticky seeds. With no previous records of this species being invasive, there was no information available on its ecological impacts or how to control its spread. So how does one deal with an invasive plant that nobody recognizes as present or invasive?

Since its discovery, local residents have mobilized to engage the National Parks Service and the Appalachian Trail Conservancy in a response to the spread of this sticky salvia; following a survey of the population on the federally-owned lands along the trail, a first control effort is scheduled for this summer. While the population at Duell Hollow had advanced beyond an “early detection” scenario before it was detected, in the larger region we now have the opportunity to detect new populations early and respond rapidly, using what knowledge we gain from Duell Hollow. And though finding another invasive in our already heavily impacted forests has been disheartening, it can offer useful lessons in both ecology and attitude. *Salvia glutinosa* at this site reminds us to assume nothing, and presents an opportunity to research its ecology, impacts, and if necessary to find effective control methods.

Tabak, N. M., 2011. *Salvia glutinosa* (Lamiaceae) naturalized in southeastern New York. *Rhodora* 113: 220-224.

Tutin, T. G., V. H. Heywood, N. A. Burges, D. M. Moore, D. H. Valentine, S. M. Walters AND D. A. Webb, eds. 1972. *Flora Europaea*. Cambridge Univ. Press, London, U.K.

Plant Conservationist of the Year

The New York Flora Association (NYFA) is pleased to announce the selection of Emily Debolt as its first Plant Conservationist of the Year. The Conservationist of the Year award will be given each year in recognition of a person’s contributions to the conservation of New York’s native plants. Emily is a certified Nursery and Landscape professional, avid botanist, and environmentalist. Through her work with the Lake George Association she came to recognize the importance of incorporating native plants in landscaping, and as a result founded Fiddlehead Creek Farm and Nursery in Hartford, NY with her husband Chris in 2009. The first 100% native plant nursery in the state, Fiddlehead Creek Farm is a labor of love. Emily and Chris grow native plants for sale to the public and provide lots of support and encouragement to those interested in using native species in their gardens and landscapes.

“Emily has been a tireless advocate for native plants for many years in her role as Director of Education at the Lake George Association and as a partner with the Adirondack Park Invasive Plant Program, as well as owner/operator of her native plant nursery. Emily has been an integral and important part of our efforts over the years to address aquatic and terrestrial invasive species issues in the Adirondack Park. “She is a go-to person for planning and implementation of invasive species control efforts and information regarding native plant species” said Dan Spada, NYFA board member and President of the Adirondack Research Consortium, who accepted the award on Debolt’s behalf at NYFA’s annual meeting on May 5th.



Emily at Fiddlehead Creek





***Solanum dulcamara* L.,**
 Climbing Nightshade
 by Knowlton Foote kfoote1@twcnv.rr.com



Solanum dulcamara is known by many names: Bittersweet Nightshade, Trailing Nightshade, Blue Nightshade, Climbing Nightshade, Woody Nightshade, Bittersweet, and European Bittersweet. Asa Gray in 1887 simply referred to it as “Bittersweet.” In this discussion I will refer to this species as Climbing Nightshade. It is a wildflower commonly seen in New York. But it is not a wildflower that we cultivate in our gardens. In fact, many call it a weed. I see it climbing to 10 feet tall in cedars in my Central New York yard but it also does well on streambanks and in wetlands. This wildflower has a diminutive flower of unusual beauty. I thought I would investigate the literature to see what is known about it, particularly its floral ecology. What I found was most interesting.

Classification

This wildflower is a member of the Solanaceae family which has between 3500 and 4000 species (Buchmann 1983). Solanaceae is well known for its huge agricultural and horticultural importance, containing species such as potato (*Solanum tuberosum*), tomato (*Lycopersicon esculentum*), pepper (*Capsicum annuum*), eggplant (*Solanum melongena*), tobacco (*Nicotiana tabacum*), and *Petunia* spp. Another is Climbing Nightshade or *Solanum dulcamara*, a binomial given to it by Linnaeus in 1753. This species is not native, having been naturalized from Eurasia. Many other species in the family are also known as “nightshades”, one of which is *Atropa belladonna* (aka “Deadly Nightshade”). And it should not be confused with another unrelated species, American Bittersweet, (*Celastrus scandens*), which is also present in the northeast U.S. but belongs to another plant family, the Celastraceae (Mitchell and Tucker 1997).

Its Names

The family name Solanaceae comes from one of the genera it contains, *Solanum*, which in turn comes from the Latin name “*solamen*” meaning “quieting.” This is because many of members of the family produce toxic alkaloids which have a quieting effect on humans (Heiser 1969). The alkaloids function to deter potential pathogens and predators to the plants such as insects and fungi (D’Arcy 1986). The poisonous compound in the genus *Solanum* is a toxic alkaloid called solanine. Solanaceae is known as the “nightshade family” since some of the members of the genus *Solanum* were first known to the English as nightshades. However, the actual origin of the name is somewhat of a mystery (Heiser 1969). The epithet, *dulcamara*, means “bittersweet.” The taste of the chewed root is first bitter, then a mild sweet taste is left (Fernald 1950). The use of this species as a medicinal to treat skin diseases dates back to the time of Theophrastus (LeStrange 1977).

Range

Climbing nightshade is one of eight *Solanum* species listed by Mitchell and Tucker (1997) as occurring in New York State. Six of the eight are also known as “nightshades. All of the eight except *S. carolinense* are immigrants to North America. *Solanum dulcamara* is believed to have come from Eurasia. It came early to New York as it is listed in *A Flora of New York State* by John Torrey in 1843. Most likely this species came as a contaminant of seed and forage or in ship ballast. Today it is naturalized from Nova Scotia as far south as Florida and west to Arizona and Washington state. Worldwide, it is found in countries such as Hungary, China, New Zealand, India, and Pakistan, to give an idea of the widespread occurrence of this species.



Description

This species is a rhizomatous perennial and can be found climbing up to 10 feet and more. The leaves, as shown in Figure 1A (Ross-Craig 1965) are petiolate with some of the leaves simple, and others often with a pair of smaller basal lobes. The flower is small, uncommonly attractive, and quite functional. The five strongly reflexed petals are light purple to violet and 1/4 to 1/2 inches (5 to 9 mm) in length. The pendant flowers open during the day and last 3 to 4 days. Each petal has at the base 2 shiny-green basal spots surrounded by a white ring (Fig. 1B). The stamens are quite short filamented. The five anthers are also short, all of equal length, connate, bright yellow and arranged into a tight cone. The cone in turn surrounds the yellow pistil which extends above the top of the anthers (Figs. 1B,C). The stamens mature before the pistil (protandrous). Of critical importance to the pollination process, each anther opens not along the lateral edge, but by two quite small pores at the tip as shown in Figure 1C. The fruit (Fig. 1E) is a green berry that changes to orange then red by mid to late summer, up to 3/8 inch (8 - 11 mm) in diameter with 15 - 20 seeds. The chromosome number in North America is $2n = 24, 48, 72$ (Gleason and Cronquist 1991). Climbing Nightshade begins flowering at the end of May and continues through early September in Central New York.

Floral Biology

In all of the Solanaceae no nectar is produced, only pollen, although pseudonectaries are common. The abundant pollen can only be removed through the small pores at the tip of the anthers by bees. The pollen is generally small in diameter and is dry and not sticky. This pollen is higher in nitrogen, protein, amino acids, and calories than most bee-pollinated species (Buchmann 1986). The amino acids include almost all of the common 17 amino acids including the 10 essential for insect nutrition. The pollen is removed by a highly specialized process termed “vibrile pollination” or commonly known as “buzz pollination.” This amazing process has involved co-evolution over millions of years between participating plants and bees. *Solanum*, the largest genus in the Solanaceae, is also the genus with the most buzz-pollinated plants (Buchmann 1983). There are the two small greenish patches at the base of each petal (Fig. 1B). These areas are the pseudonectaries (Buchmann 1983), which may function as false nectaries or as pollen guides to the central stamens for the bees. They may even have ultraviolet patterns to further guide bees as has been well documented in Black-eyed Susan (*Rudbeckia hirta*).

Buzz Pollination

Buzz pollination is found in about 6 to 8% of the 225,000 or more species of flowering plants. Monocots are represented by about 1150 species and dicots by about 19,000 species (Buchmann 1983). In buzz pollination the rapid contraction and relaxation of the large indirect flight muscles located in the bee's thorax is uncoupled from the axillary sclerites and the regular flight musculature. The result is the creation and transmittal of strong vibrations called shivering throughout their body that are passed on to the flower. The wings do not move. The bees carrying out buzz pollination vibrate their bodies 50 to 2,000 Hertz while in contact with the anther cone, resulting in the squirting out of pollen. The pollen on the bee is now available for flower pollination and larval development.

For Climbing Nightshade I have heard the buzzing 10 to 15 feet away. The buzzing lasts for only a second or less. Buzz pollination is carried out by numerous species of bees (super family Apoidea). It is the female that carries out buzz pollination, and the common honey bee (*Apis mellifera*) is not one of them (Buchmann 1983). Bernd Heinrich (1972, 1979) speculated that this vibratory action of buzz pollination requires energy for the indirect muscles that comes only from nectar, not pollen. Therefore bees must also visit nearby nectar-producing plants.

Toxicity of Berries

The toxic nature of this species has long had a reputation for being toxic to children and grazing animals, particularly the berries (Kingsbury (1964). The actual toxicity of most species in *Solanum* has not been



determined (Nelson et al 2007). And the toxicity of this species is often confused with that of another species, Deadly Nightshade (*Atropa belladonna*).

To help clarify the toxicity question, a definitive study was reported in 1990 on the toxicity of Climbing Nightshade berries by Carl Hornfledt and James Collins on mice. Both green and red berries were tested. The results of the study showed that the berries are nontoxic. The equivalent dosage in a child to that given the mice would be 59 green and 45 ripened berries. The study concluded that aggressive treatment of children ingesting small amounts of ripened berries appears to be unnecessary. The berries are not sweet. However, being red, they could be an attraction to children and children should be warned about eating them.

Dispersal of seeds

Dispersal of seed is an important topic when discussing plants. Knowing what species devour the berries gives us an idea of a plant’s range. It is also important to wildlife. Climbing Nightshade seeds are dispersed primarily by birds (see review by Waggy 2009). These birds include ring-tailed pheasant, black-cap chickadee, blackbirds, robins, and starlings. The birds eat the fleshy red berries, digest the pulp, and spread viable seeds.



Figure 1. Climbing Nightshade (*Solanum dulcamara* L.). (A) part of a flowering stem (B) part of corolla - length of tube shown by dotted line - and the androecium (C) stamen (D) calyx - partly cut away - and the gynoecium (E) part of the fruiting stem (F) seed in two views. From Stella Ross-Craig, 1965.



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NOTES of INTEREST

Michael Bevans, the Information Manager for Digitization at the The New York Botanical Garden sent this message to NYFA:

“The New York Botanical Garden has just started a crowd sourcing application to help them expand their database of plant specimens. They are looking for volunteers to help them transcribe plant specimen labels. See www.digitalphotorepro.blogspot.com for details and to sign up.”

Want to report a rare plant sighting? You can now fill out the NY Natural Heritage reporting form online. nynhp.org/eosubmit



Annual Meeting Recap

Article and Photos by Steve Young

On May fifth NYFA began their annual meeting and field trip with a visit to Nelson Swamp near Nelson, NY. We met on a beautiful sunny day just outside the village of Cazenovia and carpoled to a parking spot that provided easy access to the swamp. The participants divided into two smaller groups so we would have less impact on sensitive areas. While some of us explored the mosaic of marsh and white cedar swamp to the west, the other group went into the swamp to take a look at spreading globeflower. In one area we came across a beautiful expanse of false hellebore (*Veratrum viride*) in its early stages of growth as well as some nice meadows of *Carex bromoides* (“the other hummock sedge” as David Werier describes it).



A sea of false hellebore (*Veratrum viride*).

At the appointed time we exchanged places with the other group and listened to Dr. Sara Scanga talk about her work with Spreading globeflower (*Trollius laxus*) before heading into the swamp to look at the plant for real. For some of the group it was the first time they had seen globeflower and Sara explained all of the interesting facets of its growth and ecology. You can learn more spreading globeflower and about her work by visiting the NYFA blog. Fortunately the plants were in full flower and put on a real show for us.



Spreading globeflower (*Trollius laxus*) at Nelson Swamp.



After the field trip we drove to board member Ed Frantz's house near Cazenovia and enjoyed a delicious and bountiful lunch provided by Ed and his family. After lunch came a short business meeting with a board member vote followed by the first annual botanical quiz given by yours truly from an iPhone app called "Angiosperms." Even though there were a lot of groans at the questions, I think everyone enjoyed participating, especially the two groups that tied for the win!



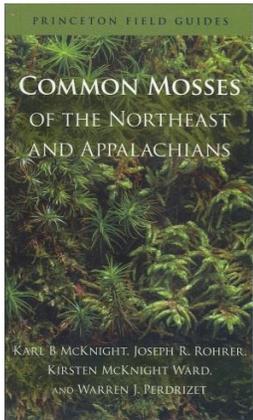
Board Members Rich Ring and Andy Nelson with wife Mary Ann enjoying the lunch at Ed's house.

We finished off the day's activities by voting for the 2014 Wildflower of the Year, a tradition that we will have every year to honor and publicize a member of our flora for the next calendar year. This year's win went to cardinal flower (*Lobelia cardinalis*), one of our most spectacular and well-known wildflowers. Many thanks go to the organizers of the field trip and luncheon and to the record number of participants we had for the meeting. It was one to remember.



Cardinal Flower, the 2014 NYFA Wildflower of the Year, at Indian Lake in the Adirondacks.





Common Mosses of the Northeast and Appalachians

Karl B. McKnight, Joseph R. Rohrer, Kirsten McKnight Ward,
and Warren Perdrizet, 2013.

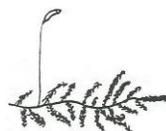
Princeton Field Guides
Princeton University Press
Review by Tom Phillips

Mosses are a significant part of the flora of many ecosystems. Many naturalists show an interest in them but the need for microscopic study seems to discourage some from pursuing further study. We now have a new field guide that helps identify up to 200 of the most common mosses of the Northeast and Appalachians. The authors use three major key features to help identify each specimen. First: growth form; is it an acrocarp with stems simple or sparingly forked (packed in tufts), a pleurocarp with stems branched freely and twined together in mats, or a peat moss with stems vertical with pendant branches in clusters of three or more. The second key feature is leaf shape, with a variety of shapes diagramed. The third key feature is the presence or absence of a leaf midrib. All features are clearly diagramed and the authors developed a very nice color code which shows as color tabs on the pages that describe the different species. There is a nice page with a flow chart incorporating all three features that will lead you to either a group of color tabbed pages that you can browse to identify your specimen or to additional dichotomous keys that will further refine your search.

You will need to have a good hand lens to identify leaf characteristics. I feel one of the goals of the authors has been to provide a guide that most naturalists can use to observe and learn about mosses without the need for microscopes. They have done a remarkably good job in accomplishing that goal and for the most part leaf shape and midrib can be identified with a hand lens. There are some specimens that a good microscope will be needed to render better images with more detail. Each species description is concise with very nice color photographs of the moss's general appearance. They also included drawings from the monumental work of Crum & Anderson's *Mosses of Eastern North America* to better demonstrate significant features. Together the images provide very nice representations of the different mosses.

Sphagnum seem to bedevil many botanists and the Guide provides identification for a few but not all the common Sphagnum of the Northeast. This is a section that I feel could be expanded with more species included. For those naturalists interested in learning more about Sphagnum, unfortunately a compound microscope will be needed since microscopic characteristics are important features to make a positive identification for many species.

The Common Mosses of the Northeast and Appalachians is a very nice, fairly inexpensive addition to anyone's library. The book is sized as a field guide so it is easy to carry in the field and has a water resistant cover. I think the authors have done a great job with bringing these Lilliputian plants into the realm of study for us all. Now, how about the liverworts?



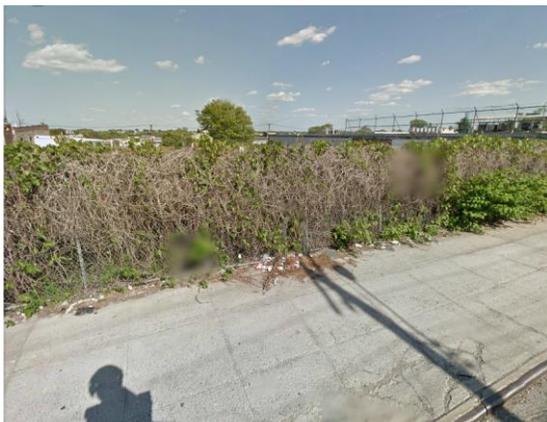
A New Botanical Duo

by Steve Young, NY Natural Heritage Program

Britton and Brown, Gleason and Cronquist, Mitchell and Tucker, Johnson and Eldblom, Hellquist and Crow, and Werier and Weldy. If you have identified a plant in New York you may have used a reference by one of these botanical duos. Another pair has now joined that list: Google and Bing. More and more I find myself using Google and Bing to identify the many mystery plants whose photos come to my inbox from all over the state. Search engines have access to so many botanical websites, thousands of photos, and so much literature that they can act like random access keys with accompanying photos. It's like asking Watson, the supercomputer on Jeopardy, to identify a plant. Granted, it's much easier for a botanist to look through the results and eliminate obvious errors, but eventually, it may be possible for anyone to put in plant characters or photos for these search engines to identify. For example, I recently received a photo of a monkey-puzzle tree that was being grown on Long Island. If I enter "tree with triangular spiny leaves spiral on stem" into Google Images, photos of the monkey puzzle tree will be in the mix. It is actually the second photo in the list! This kind of search is especially helpful for exotic plants where I have no idea where to start and for which I know I don't have a reference. Sometimes the search engine will refer you to a relevant key to use.

Another great use for these sites is their aerial and street-view photography. Bing Maps' Bird's-eye View is very useful for looking at specific areas of the state and identifying vegetation types, or even specific species like Phragmites, because it can zoom in closer than Google Maps and it has an oblique view. Google Street View came in handy for me recently when I was tracking down old records of kudzu on Long Island. I wanted to check a record that said "Queens 127th Street in College Point." I went to Street View and walked up and down 127th street and low and behold there it was, still draped over a fence along the street. I could also see it in an empty sump in Brooklyn along Vandervoort Ave. and Maspeth St. and behind a shopping center on 61st Steet in Douglaston, Queens. These are invaluable tools to prevent unnecessary field trips to places that don't exist anymore or to see that a field trip will be useful to confirm a sighting. We just don't want them to be good enough to make field trips only a desk job!

Will this duo eventually supplant professional botanists? I don't know but it may happen one day (what are those famous phrases about how a new technology would never amount to anything?). For now, they are certainly helping me out a lot in my work and I think future botanists will rely on them even more. Let me know of a memorable experience you have had using them for plant identification and we can publish them in future issues. Maybe one of you is using Google and Bing (or other search engines) in a way we have never thought of. Send them to me at young@nynhp.org.



Kudzu on the fence at 31 127th St., Queens in Google Street View. You can see the shadow of the street view vehicle camera at the bottom right and also some plants of Japanese knotweed.





Bark: A Field Guide to Trees of the Northeast

Michael Wojtech, 2011

University Press of New England

Review by Anna Stalter

Summer at last and the leaves on the trees are gloriously full. We gaze upward at the myriad shapes in various shades of green and recognize the familiar: charming “mittens” waving hello, long slender finger-like lobes reaching toward the sun, branches a-flourish with bouquets of bristle-tipped leaves. Were it not for its leaves would we know the sassafras, the silver maple, the red oak?

Michael Wojtech, author of **Bark: A Field Guide to Trees of the Northeast**, suggests that, in fact, the best way to identify trees of the northeast is not by their leaves, but by their bark. It is the single feature of trees that is evident and accessible year round. But though we’ve all identified tree species by their bark to some degree (burnt potato chips, elephant hide, camouflage = black cherry, American beech, sycamore), beyond a few obvious examples, doing so can be very challenging. Furthermore, bark changes as a tree ages, and the descriptions and photos of bark in field guides generally depict only mature individuals. Wojtech's guide attempts to address the difficulties of identifying tree species by their bark by providing keys based on a well-defined set of characters and extremely useful photos. With the encouragement of his thesis adviser at Antioch University of New England, Tom Wessels, author of “Reading the Forested Landscape”, Wojtech observed and photographed the bark of hundreds of trees of the northeastern forests (details about his process at <http://www.americanforests.org/magazine/article/the-language-of-bark/>), and over time discerned patterns that he assembled into keys to identification.

Wojtech’s primary bark key distinguishes between seven different bark types based on observable patterns of ridges and furrows, plates, scales, and other features. A secondary, dichotomous key further subdivides those types, ultimately leading to the identification of one or another of 67 native and naturalized tree species of New England and eastern New York State, whether the individual is young, mature or old. The key is easy to navigate, though ultimately may lead to several choices. Working through the key, a tree with smooth, unbroken bark that is not coniferous, does not have a fluted sinewy trunk and whose bark does not have vertical lines could be a young or mature American beech, a young red maple or a young silver maple. For each of these options, the user is directed to another page in the book, where a species description is found.

Each species description is accompanied by line drawings of leaves, a range map, and habitat and other notes. But the most useful are the photos that accompany the species accounts; for each species, Wojtech includes photos of the bark on young, mature and old trees, with additional text describing important features that distinguish, for example, a young from a mature American beech. Comparing the photos and notes in the species accounts for each of the options reached at the end of the key helps to ultimately identify the tree. The photos are critical to the process; fortunately the image quality is excellent and the necessary details are clearly evident.

In addition to the keys and species accounts, the book includes a chapter on bark structure that provides essential background for understanding how such diverse bark patterns emerge, and a chapter on bark ecology that explains how these manifestations serve to protect trees and influence their interactions with other organisms in the forest.

I have used **Bark: A Field Guide to Trees of the Northeast** with satisfying results; it is an excellent addition to the backpack of any naturalist who spends time in the forest and wants to improve their knowledge of the tree species therein.

Editor’s Note: Michael will be offering a bark class in Albany to NYFA members on October 26th. More details at nyflora.org



Field Trip Report, Fitzgerald Pond, 23 June 2013.

On a very hot and humid day, a day on which CBC radio had predicted a humidex reading of 104 degrees Fahrenheit, eight intrepid individuals bushwhacked their way down a very steep hill to Fitzgerald Pond in Hogsback State Forest, Lewis County.



The group about to head into the woods. Missing from the photo is Ken Hull, who took the picture.

Right away, after crossing the water filled moat, we were instantly treated to a showy lady's-slipper (*Cypripedium reginae*) and a pink wintergreen (*Pyrola asarifolia*) in flower. Other showy and not so showy (but exciting) finds followed (see the accompanying list).



The flowers of pink wintergreen, Fitzgerald Pond. Photo by Kenneth Hull.

The peatland surrounding Fitzgerald Pond ranges from rich cedar swamp with an attractive and fairly open understory of alpine cottongrass with scattered orchids to a wetter, more open area with cattails, then into an open bog mat with typical poor fen species. A special treat was an all white showy lady's-slipper



toward the back of the fen, well worth the slog to get there. Who would have thought, since showy lady's-slippers are so, well, showy, that a white lady-slipper would be so striking! But it certainly was.



The white showy lady's-slipper at Fitzgerald Pond. Photo by Kenneth Hull.

After traversing much of the area and eating lunch on the bog mat, we all slowly made our way back up the steep slope and out to the road, after which we had a walk down the railroad tracks at Bonaparte and a quick look into the shrub fen portion to the south of the tracks, where we were able to see much dwarf birch. All in all, the trip was deemed a success despite the heat.



Dwarf Birch at Bonaparte. Photo by Kenneth Hull.

Plant list for Fitzgerald Pond, 23 June 2013, with some additions from Steven Daniel who visited a bit later.

Ferns and Fern Allies

Fern, Crested *Dryopteris cristata*
 Horsetail, Water *Equisetum fluviatile*
 Fern, Sensitive *Onoclea sensibilis*

Fern, Cinnamon
 Fern, Royal
 Fern, Marsh

Osmunda cinnamomea
Osmunda regalis var. *spectabilis*
Thelypteris palustris var. *pubescens*



Grasses, Sedges, and Rushes

Grass, Bluejoint	<i>Calamagrostis canadensis</i> var. <i>canadensis</i>
Sedge, Aquatic	<i>Carex aquatilis</i> var. <i>substricta</i>
Sedge	<i>Carex atlantica</i> ssp. <i>capillacea</i>
Sedge	<i>Carex billingsii</i>
Sedge, Brownish	<i>Carex brunnescens</i> ssp. <i>sphaerostachya</i>
Sedge, Creeping	<i>Carex chordorrhiza</i>
Sedge, Two-stamen	<i>Carex diandra</i>
Sedge, Two-seeded	<i>Carex disperma</i>
Sedge, Prickly	<i>Carex echinata</i> ssp. <i>echinata</i>
Sedge, Starved	<i>Carex exilis</i>
Sedge, Inland	<i>Carex interior</i>
Sedge, Lake	<i>Carex lacustris</i>
Sedge, Villose	<i>Carex lasiocarpa</i> ssp. <i>americana</i>
Sedge, Delicate	<i>Carex leptalea</i>
Sedge, Mud	<i>Carex limosa</i>
Sedge, Boreal Bog	<i>Carex magellanica</i>
Sedge, Few-flower	<i>Carex pauciflora</i>
Sedge, Tussock	<i>Carex stricta</i>
Sedge, Three-seed	<i>Carex trisperma</i> var. <i>trisperma</i>
Oatgrass, Poverty	<i>Danthonia spicata</i>
Spikerush	<i>Eleocharis erythropoda</i>
Cottongrass	<i>Eriophorum vaginatum</i>
Cottongrass, Tawny	<i>Eriophorum virginicum</i>
Cottongrass	<i>Eriophorum viridicarinatum</i>
Timothy, Marsh	<i>Muhlenbergia glomerata</i> ?
Reed Canary Grass	<i>Phalaris arundinacea</i>
Reed, Common	<i>Phragmites americanus</i>
*Reed, Common	<i>Phragmites australis</i>
Beak-rush, White	<i>Rhynchospora alba</i>
Bulrush, Alpine	<i>Trichophorum alpinum</i>

Herbaceous Plants

Sarsaparilla, Wild	<i>Aralia nudicaulis</i>
False-nettle	<i>Boehmeria cylindrica</i>
Grass pink	<i>Calopogon tuberosus</i>
Bellflower, Marsh	<i>Campanula aparinoides</i>
Cinquefoil, Marsh	<i>Comarum palustre</i>
Ladyslipper, Yellow	<i>Cypripedium parviflorum</i> var. <i>parviflorum</i>
Ladyslipper, Showy	<i>Cypripedium reginae</i>
Water-willow	<i>Decodon verticillatus</i>
Aster, Flat-topped	<i>Doellingeria umbellata</i> var. <i>umbellata</i>
Sundew, Round-leaf	<i>Drosera rotundifolia</i> var. <i>rotundifolia</i>
Willowherb, Marsh	? <i>Epilobium strictum</i>
Avens, Purple	<i>Geum rivale</i>
Iris, Wild; Blue flag	<i>Iris versicolor</i>
Twinflower	<i>Linnaea borealis</i> ssp. <i>americana</i>
Twayblade, Bog	<i>Liparis loeselii</i>
Water horehound	<i>Lycopus americanus</i>
Swamp candles	<i>Lysimachia terrestris</i>
Loosestrife, Tufted	<i>Lysimachia thysiflora</i>

Mayflower, Canada	<i>Maianthemum canadense</i>
Buckbean, bogbean	<i>Menyanthes trifoliata</i>
Smartweed, Water	<i>Persicaria amphibia</i>
Orchid, No. Green	<i>Platanthera aquilonis</i>
Orchid, White fringe	<i>Platanthera blephariglottis</i> var. <i>blephariglottis</i>
Orchid, White bog	<i>Platanthera dilatata</i> var. <i>dilatata</i>
Pogonia, Rose	<i>Pogonia ophioglossoides</i>
Wintergreen, Pink	<i>Pyrola asarifolia</i> ssp. <i>asarifolia</i>
Raspberry, Dwarf	<i>Rubus pubescens</i> var. <i>pubescens</i>
Wapato; Arrowleaf	<i>Sagittaria</i> sp.
Pitcher plant	<i>Sarracenia purpurea</i>
*Nightshade, Deadly	<i>Solanum dulcamara</i> var. <i>dulcamara</i>
Goldenrod, Swamp	<i>Solidago uliginosa</i> var. <i>linoides</i>
Aster, Rush or Bog	<i>Symphotrichum boreale</i>
Aster, Purple-stem	<i>Symphotrichum puniceum</i> var. <i>puniceum</i>
Starflower, Maystar	<i>Trientalis borealis</i>
Cat-tail, Common	<i>Typha latifolia</i>
Bladderwort	<i>Utricularia intermedia</i>
Violet	<i>Viola</i> sp.

Shrubs

Bog rosemary	<i>Andromeda polifolia</i> var. <i>glaucophylla</i>
Chokeberry, Black	<i>Aronia melanocarpa</i>
Leatherleaf	<i>Chamaedaphne calyculata</i>
Bunchberry	<i>Cornus canadensis</i>
Red Osier	<i>Cornus sericea</i>
Snowberry	<i>Gaultheria hispidula</i>
Wintergreen	<i>Gaultheria procumbens</i>
Huckleberry	<i>Gaylussacia baccata</i>
Winterberry	<i>Ilex verticillata</i>
Laurel, Pale	<i>Kalmia polifolia</i>
Honeysuckle, Swamp	<i>Lonicera oblongifolia</i>
Honeysuckle, Mt.	<i>Lonicera villosa</i>
Sweet-gale	<i>Myrica gale</i>
Holly, Mountain	<i>Nemopanthus mucronatus</i>
Buckthorn, Alder-leaved	<i>Rhamnus alnifolia</i>
Labrador Tea	<i>Rhododendron groenlandicum</i>
Willow, Hoary	<i>Salix candida</i>
Willow, Bog	<i>Salix pedicellaris</i>
Meadow-sweet	<i>Spiraea alba</i> var. <i>latifolia</i>
Blueberry, Lowbush	<i>Vaccinium angustifolium</i>
Blueberry, Highbush	<i>Vaccinium corymbosum</i>
Cranberry, Large	<i>Vaccinium macrocarpon</i>
Cranberry, Small	<i>Vaccinium oxycoccos</i>

Trees

Maple, Red	<i>Acer rubrum</i> var. <i>rubrum</i>
Shadbush, Juneberry	<i>Amelanchier</i> sp.
Ash, Black	<i>Fraxinus nigra</i>
Tamarack	<i>Larix laricina</i>
Pine, White	<i>Pinus strobus</i>
Cedar, White	<i>Thuja occidentalis</i>



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