NYFA New York Flora Association

# Quarterly Newsletter

Summer 2018 Volume 29 Issue 3

**New York Flora Association Newsletter Summer 2018**

**Editor's Note:** Did you ever wonder why certain counties in the Atlas do not appear to have a common plant, for instance: why is there no sugar maple or dandelion in Jefferson County, or why no common buttercup in Saratoga County? The reason is that no voucher specimen for these species have been deposited in an herbarium for that county. Jackie Donnelly tackled this problem for her county: see the article on page 10. You too can contribute! We also have articles on two plants of interest, field trip reports (see the NYFA Facebook page for more photos and for photos of trips not included here), the annual meeting announcement, and a disturbing piece on the effect of deer on the landscape. Dick Mitchell wrote a similar article in the June 1997 NYFA newsletter (over 20 years ago!); the situation has not changed much since that time.

**Articles Inside:**



**New York Flora Association**

*Address: P.O. Box 122*
*Albany, NY 12201*
*Phone: (518)250-6054*
*Email:* editor@nyflora.org
*Website:* www.nyflora.org
*Blog:* www.nyfablog.org
*Twitter:* @newyorkflora
*Editor: Anne Johnson*

## Protecting a Rare Mint in Urban New York City

by Rebecca Carden

Staten Island, New York City (NYC) is home to the state-endangered (S1S2) *Pycnanthemum verticillatum* (Michx.) Pers. var. *verticillatum*, a perennial herb in the Lamiaceae family with fragrant, spearmint-scented leaves and a clustered inflorescence. This plant's history is filled with conservation challenges: for the last few decades, Staten Island has undergone rapid urban development, and *P. verticillatum*, like many rare plants, has faced disturbance and habitat loss. Local Staten Island botanist Richard Lynch of the Sweetbay Magnolia Bio Reserve Conservancy found an occurrence of this plant in 2003 at Kreischer Hill; it was originally identified as the federally listed (G2, S1) *Pycnanthemum torreyi* Benth. Several closely related *Pycnanthemums* have had disputed taxonomies and only subsequent detailed analysis clarified which one this was – more details below.

*P. verticillatum* flowers at a planting site on Staten Island in 2017. Photo by Rebecca Carden.

Despite the best efforts of local conservationists, the parcel where these plants grew was turned into a shopping center in 2005. The *Pycnanthemum* population was saved, but confined to a fenced enclosure while the surrounding habitat was lost. To mitigate the damage from construction, the developer was obligated to provide NYC Parks with funding to design a conservation plan for the Kreischer Hill population, as well as an out-planting project to establish new colonies. The Greenbelt Native Plant Center collected and germinated seed from Kreischer Hill and, in 2006, planted *Pycnanthemum* at nineteen sites on public property across Staten Island. Botanists have been studying and managing these plants ever since. To clarify the taxonomy of the occurrence and develop a monitoring protocol, botanist and professor Jay Kelly was hired to monitor the populations. Through in-depth morphological analysis of several species of *Pycnanthemum*, he determined that this Staten Island occurrence is actually the state listed *Pycnanthemum verticillatum* var. *verticillatum* (Kelly 2013).

Today, over ten years after the original out-plantings, many of the 2006 *Pycnanthemum* plantings are thriving examples of how appropriate plant population augmentations can help preserve local biodiversity and create opportunities for research on rare plant ecology. As a field technician for NYC Parks, I have had the privilege of studying these charming mints, their taxonomy and their ecology, for the past two seasons.

*Pycnanthemum* is a notoriously difficult genus to identify to species. *P. verticillatum,* with its narrow leaves and hairy stem, most closely resembles *P. torreyi* and the more common *P. virginianum* (L.) Durieu & Jacks. ex Fernald & B. Robinson. Jay Kelly's 2013 morphological survey included *Pycnanthemum* spp. across the region, and he distinguished between species based on their hairs, posture, and habitats. Weakley (2016) and Gleason and Cronquist (1991) are also useful taxonomic keys for differentiating these three species by the distribution of their hairs. I had the opportunity to examine *Pycnanthemum* specimens at the herbaria of the New York Botanical Garden and the Staten Island Museum to better understand the morphological differences between these species (Tulig et al. 2018, Staten Island Museum Herbarium 2018). Here are a few tricks for telling them apart in the field:

**P. verticillatum:** *P. verticillatum* and *P. torreyi* both have hairy stems, with hairs evenly distributed on stem angles and faces. One way to tell them apart is to look at the bracts below the inflorescence, which should be hairy on the upper surface in *P. verticillatum* (Weakley 2016). *P. verticillatum* also has a more rigid posture, stiffer leaves, and more flowers than *P. torreyi*, and often grows in sandy or loamy soils (Kelly 2013). Additionally, *P. verticillatum* seems to produce only pistils and occasionally underdeveloped anthers. Henrietta Chambers (1961) reported that after examining several specimens of this species, she did not observe any fully developed anthers; none were observed on the herbarium specimens I examined either. As a result, Chambers hypothesized that the species likely reproduces by apomixis, or the production of viable seed without fertilization or meiosis.

Photo of a *P. verticillatum* specimen from Staten Island, pressed in 2003 when the population was discovered. It is housed in the herbarium of the Staten Island Museum. Photo by Rebecca Carden, printed with the permission of the Staten Island Museum.

**P. torreyi:** Like *P. verticillatum*, *P. torreyi* has an evenly hairy stem. However, the bracts below its inflorescence are hairless on the upper surface (Weakley 2016). It also has a limper posture and fewer flowers than *P. verticillatum*, and can be found growing on rockier substrates (Kelly 2013). *P. torreyi* flowers also produce fully developed stamens along with the pistils, and plentiful anthers were observed on the herbarium specimens.

**P. virginianum:** There are hairs on the stem of *P. virginianum*, but they are longer and denser on the angles and absent on the faces (Weakley 2016). Henrietta Chambers (1961) also found that specimens of this species from the northeast had only styles and undeveloped anthers, while specimens from the Midwest had full anthers.

We are also interested in the genetic diversity of the plantings. Fostering healthy, localized genetic diversity is a factor in any conservation planting project or rare plant management program. It is of particular interest in this case because all nineteen planted *P. verticillatum* populations were grown from the same seed source – the original wild Staten Island occurrence. Additionally, since this species lacks anthers and likely reproduces by apomixis, its seeds are probably genetic clones of their parents. Together, these factors may have limited the genetic diversity of this plant across the Island. For this reason, we plan to implement pilot tests designed to examine *P. verticillatum* reproduction strategies this summer.

At NYC Parks, we monitor the original wild *P. verticillatum* occurrence annually, along with the planted populations. Data from our permanent transects and plots give us valuable information about preferred *P. verticillatum* microhabitats, including canopy cover, soil characteristics, and associated species. All this information helps us determine the optimal habitat conditions for the plants, and will help ensure that all of the occurrences, especially the original Kreischer Hill population, will be able to survive on their own and continue to thrive in the urban environment once the mitigation funding runs out. It is always a pleasure to spend the day in the field with these charismatic forbs. *Pycnanthemum* species flowers will peak from mid-July through August, so be on the lookout for these mints in the upcoming weeks!

A *P. verticillatum* permanent plot from the 2017 field season. Photo by Rebecca Carden.

**References:**

Chambers, Henrietta L. 1961. Chromosome Numbers and Breeding Systems in *Pycnanthemum* (Labiatae). Brittonia 13(1): 116 – 128.

Gleason, Henry A. and Arthur Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. 2nd ed. New York (NY): The New York Botanical Garden Press.

Kelly, Jay F. 2013. Results of Studies of Rare Mountain Mint (Pycnanthemum) Species on Staten Island, NY. Round Mountain Ecological LLC. Raritan Valley Community College, Dept. of Science and Engineering.

Staten Island Museum Herbarium. 2018. Staten Island Museum Herbarium (NY). Staten Island Museum. Accessed on 29 Mar 2018.

Tulig M, Ramirez J, Watson K. 2018. The New York Botanical Garden Herbarium (NY). Version 1.3. The New York Botanical Garden. Occurrence dataset https://doi.org/10.15468/6e8nje accessed via GBIF.org on 2018-04-18.

Weakley, Alan S. 2015. Flora of the Southern and Mid-Atlantic States. 1st ed. Chapel Hill (NC): University of North Carolina Herbarium; [accessed 10 Jan 2017]. http://www.herbarium.unc.edu/Flora Archives/WeakleyFlora_2015-05-29.pdf

## EVENING PRIMROSE, *Oenothera biennis* L.

by Knowlton Foote

Evening primrose is one of the most remarkable native wildflowers in New York State, standing out in particular because of the many contributions it has made to the understanding of plant genetics. Because of its unusual genetics, it has been one of the most intensely studied of our wildflowers.

### Name and classification

Evening primrose received its scientific name, *Oenothera biennis*, from Carolus Linnaeus in l753. The generic name, Oenothera, comes from two Greek words meaning "wine imbibing." An infusion of the root of evening primrose was supposed to be either an incentive to drink wine or an enhancement of one's capacity to imbibe (Shosteck 1974). The specific name, biennis, refers to its two-year life cycle (although an annual life cycle has also been observed (Kinsman 1982)). Evening Primrose belongs in the Onagraceae (Evening Primrose) family. It is closely related to three other species that occur in the northeast: *Oenothera strigosa*, *O. parviflora*, and *O. argillicola*. These four species all contain a diploid chromosome number of 2n = 14 and are evolutionarily closely related. In addition, each of these species has numerous races that hybridize with one another. In "Gray's Manual of Botany" (Fernald 1950), the family Onagraceae is described as "hopelessly confused and freely hybridizing."

### Flower structure

Figure 1 is an early diagram by Henri Baillon (1880) showing the structural detail of evening primrose; in Figure 2 the flower is seen in color. The attractive yellow flower is 2 to $2^1/_2$ inches in length and consists of four petals and four sepals. Within these sepals and petals are eight stamens and a pistil. Below the petals the sepals narrow considerably into a thin green floral tube (hypanthium) $1^1/_4$ to $1^1/_2$ inches long where nectar is stored. At the base of this tube is a ½ to 1 inch long ovary that develops into the seed capsule.

Figure 1. Long section of flower (left) and floriferous branch (right), Baillon 1880.

**Habitat and range**

Evening Primrose is found in old fields, along fences, roadsides, and in stream beds. Some of the best patches I have seen have been along railroads. It is found throughout the northeast and south to Florida and Texas with some varieties existing as far west as Arizona (Gleason l963). It blooms from July through October (Gleason 1963).

**Watching a flower open**

To observe an exciting botanical event, try watching an evening primrose flower actually open. Many summers ago I observed four flowers opening on a warm 75 to 80 degree summer evening in eastern Massachusetts. Flowers about to open can be easily identified: they are shaped like a bowling pin, are larger than the other buds, and the yellow color of the expanding petals can be readily seen. The first flower opened at 8:30 pm, a half hour after sunset. Other flowers on the same plant opened at 9:11, 9:21, and 9:42 pm. The flowers almost popped open and required only a second or two to produce a flower that was 50% open. Another 2 to 3 minutes were needed for the full yellow-petal expansion. As this process took place, an attractive odor of lemon was obvious. No flowers opened in the daytime and each opened flower lasted only one day. From this sunset performance, we can see where this species obtained its common name - evening primrose. Also, of botanical interest, using a hand lens, you can see within the flower a viscid mass composed of small triangular shaped pollen grains that were released from the anthers before the flower opened.

Figure 2. Color photo of evening primrose.

**Pollination**

The newly opened flowers are now ready for evening pollinators. The first botanist to describe this process was the pioneer floral biologist, Christian Konrad Sprengel, who described its floral pollination in 1793. Sprengel suggested that this species was likely pollinated by nocturnal insects, and it turned out he was right. Because of the depth that an insect must reach for the nectar, only long-tongued moths and butterflies can use it effectively. A moth inserts its proboscis into the long floral tube as it lands or hovers in front of the flower. In doing so, it brushes its head against the anthers which surround the entrance to the tube and so becomes pollen covered. The nectar is mainly sucrose, with a concentration of 8%, which is favorable to moths (Perceval 1961). The flowers of evening primrose have been shown to contain ultraviolet patterns, an aid to daytime pollinators (Dement and Raven 1974).

**Seed Production**

Evening primrose has no means of vegetative reproduction, so seed production is very important. Each pistil produces up to 190 seeds and each seed weighs only 0.3 to 0.4 mg. (Hoff 1962). As the walls of the capsule open, the seeds are dispersed by wind and simply drop to the ground near the parent plant. Aiding the spread of seeds are birds such as goldfinches, which are voracious seed eaters. Once in the soil seed bank, the seeds have relatively good longevity, with up to 38% of seeds germinating after 50 years of being buried in the ground, and up to 10% after 80 years (Kivilian and Bandurski l981).

**Evolutionary history**

As described by Ralph Cleland in l958, at least four distinct genetic lines are thought to have existed at different periods, spreading from a center of origin in Mexico or Central America. The first group began to spread northward after the Pleistocene epoch a million years ago (Gates 1933). This group was characterized by large flowers ($2^1/_2$ inches) in diameter. After the first population had spread across the continent, a second group developed in Mexico and Central America in the territory occupied by the first population, with which it crossed. This process was repeated a third time and again a fourth time over eons of time, resulting in the species we have today.

**Genetics of Evening Primrose**

Dutch geneticist Hugo de Vries in 1886 was the first to report that Oenothera was genetically peculiar, based on changes in stem color, hairs (trichomes) on the stem, shape of the flower, number of petals, color of petals etc. From his observations, de Vries formulated his celebrated Mutation Theory of Evolution in 1901. The mutation theory was correct, ironically however, it was based on incorrect deductions. As it turned out, this species, it was later discovered, has quite an unusual meiosis.

What happens in its meiosis is that the first division is substantially altered though the second division is normal (Dr. Harry Stinson, personal comm.). *O. biennis*, as well as most species in this genus, has 14 chromosomes. During the normal process of forming gametes, the 14 chromosomes would behave as seven independent pairs with one chromosome of each pair coming from each parent. However, in revealing studies by Otto Davis, Hugo DeVries , Bradley Davis, Harley Bartlett and Ralph Cleland over 20 years, the chromosomes were shown to behave not as seven independent pairs of chromosomes, but as one large circle of 14 chromosomes! The chromosomes alternate around the circle with first a chromosome from one parent followed by a chromosome from the other parent, each chromosome occupying a definite position in the circle. During the first stage of meiosis when the chromosomes divide to go to each pole, alternate chromosomes of the circle move in opposite directions. As a result, all the chromosomes from one parent go together in one direction while the other set of parental chromosomes goes in the opposite direction. The chromosomes and the genes they carry from each parent are kept intact from generation to generation and thus maintain their identity indefinitely, not mixing as they would in normal meiosis. Thus, two linkage groups exist, each group containing seven chromosomes.

**Other genetic findings**

Over the years of studying the genetics of this species other surprises were shown depending on the race of the particular evening primrose used. Some flowers were shown to self-fertilize in the bud before they ever open, with anthers bursting open over the receptive stigma as much as 24 hours or more before the buds open (Cleland 1972). This self-fertilization insures that no foreign sets of chromosomes from other varieties

or species can come in and that the original two sets of chromosomes from the parents are once again united for the next generation. Seeds resulting from this self-fertilization produce plants almost identical to the parents.

**Final thoughts**

Evening primrose (as well as the entire genus *Oenothera*) has contributed a good deal of information to the study of plant genetics. Because of its unique genetics, including the 14 chromosomes in a circle during meiosis as well as lethal genes, limited cross pollination, and self-fertilization, it drew substantial interest from geneticists from 1900 to 1960. Scientists such as Hugo de Vries from The Netherlands, Reginald Ruggles from Great Britain, Otto Renner from Germany, and Ralph Cleland, Bradley Davis, Erich Steiner, and Harley Bartlett from the United States all contributed to the basic understanding of its genetic systems. As a result, a better picture of plant genetics as a whole developed. Part of the foundation of plant genetics as we know it today has come from one of the wildflowers commonly seen in New York - Evening Primrose.

My thanks go to Robert Dirig for reviewing this article, and to Dr. Harry Stinson, an Oenothera expert and professor on the faculty or Cornell University for 36 years, for discussing this wildflower with me in the past.

**BIBLIOGRAPHY**

Baillon, Henri. 1880. The natural history of plants. Vol. VII. L. Reeve & Co. London.
Cleland, Ralph E. l958. The evolution of the North American Oenotheras of the "biennis" group. Planta 51: 378 398,
Cleland, Ralph E. 1972. Oenothera, cytogenetics and evolution. Academic Press. New York. 370 pgs.
Dement, William A. and Peter H. Raven. 1974. Pigments responsible for ultraviolet patterns in flowers of *Oenothera biennis* (Onagraceae). Nature 252: 705 - 706
Fernald, Merritt L. 1950. Gray's manual of botany. 8th ed. Amer. Book Co. New York.
Gates, R. Ruggles. 1933. Some phylogenetic considerations in the genus Oenothera, with descriptions of two new species. J. Linn. Soc. Bot. 49: 173-196.
Gleason, Henry A. 1963. The new Britton and Brown illustrated flora of the northeastern United States an adjacent Canada. Vol. II. Hafner Publ. Co. New York
Hoff, Victor J. 1962. An analysis of outcrossing in certain complex-heterozygous euonotheras. I. Frequency of outcrossing. Amer J. Bot. 49**:** 715-721.
Kinsman, Sharon. 1982. Herbivore responses to *Oenothera biennis* (Onagraceae): effects of the host plants size, genotype, and conspecific neighbor. Ph.D. Cornell University, Ithaca, New York.
Kivilian, A. and Robert S. Bandurski. l981. The one hundred-year period for Dr. Beals's seed viability experiment. Amer. J. Bot. 68: 1290- 1292.
Linnaeus, Carolus. 1753. Species plantarum. Stockholm.
Percival, Mary S. 1961. Types of nectar in angiosperms. New Phytol. 60. 235-281.
Shosteck, Robert. l974. Flowers and plants. An international lexicon with biographical notes. Quadrangle, New York Times Book Co. 329 pp.

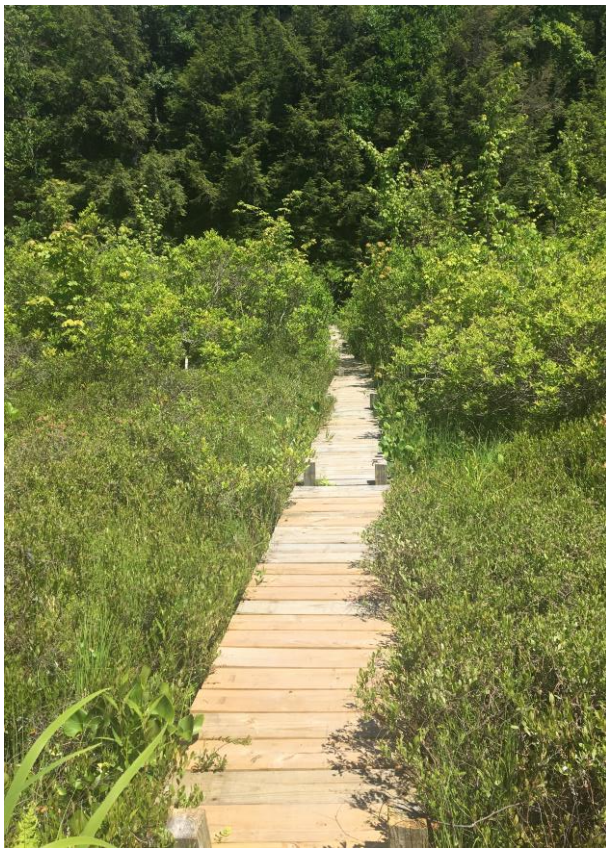
**Editor's Note:** During our botanical explorations in northern New York, we came to the conclusion that most of our Evening Primrose was *O. parviflora* rather than *O. biennis*. This may only apply in northern NYS, but since *O. parviflora* is not found in general field guides, you may want to take a look at your populations. They are distinguished by the presence of a "ledge" at the sepal tips in *O. parviflora*; otherwise they look and behave very much alike.

## Clapper Lake: Woods, Marsh and Bog - Trip Report. June 17, 2018

By Steve Young, NYFA Secretary

It was a beautiful June day for the 18 people that joined us for a walk to explore the flora of Clapper Lake habitats in Delaware County. The lake is owned by the Kernan family and they were gracious enough to allow us to explore it for the day. After an orientation on the road, the group walked about a half mile down a dirt road through a nice deciduous forest with interesting shale cliffs to the shores of the lake where a small floating boardwalk snaked through the marsh to the edge of the lake.

There was a miscommunication with the owners about the availability of paddles for the canoe there, so we did not have a chance to use it to boat over to the bog on the far side of the lake. Instead we spent some time walking around the lake trying to find a way through the moat to get to the dwarf shrub bog. We found one section of the moat that seemed firm enough but only about half of us were willing to chance a crossing, and with good reason. We all went up to about our waists in the water (some a little more) but managed to make it over to the bog where we thought we might find some dragon's-mouth orchids.

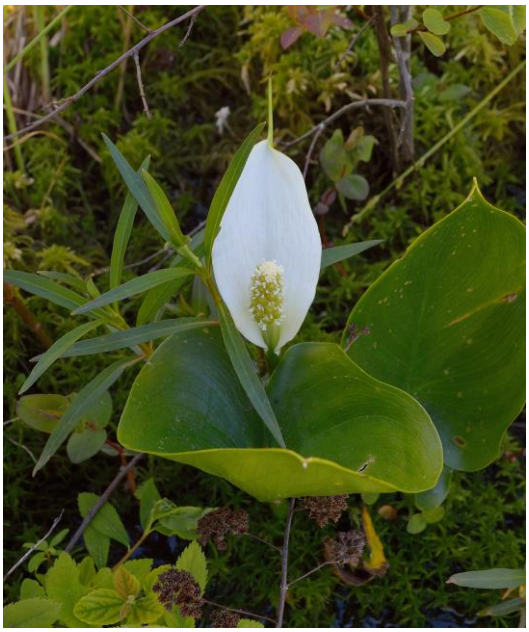


Even though we didn't find the orchid we saw a beautiful example of a dwarf shrub bog dominated by black spruce, highbush blueberry, and leatherleaf. After some time on the bog we trudged and clawed our way back through the moat to dry land and headed back to the dock where the others were waiting after having explored the marsh and surrounding woodlands. Even though the trip didn't work out quite as planned we managed to see a diverse flora on a beautiful day. Below is the plant list that we compiled from the participants.

## Clapper Lake Plant List

Compiled by Steve Young and the Group

***Wildflowers***
Bird's-eye Speedwell (Veronica chamaedrys)
Blue Flag (Iris versicolor)*
Buck-bean (Menyanthes trifoliata)*
Bulbiferous Water-Hemlock (Cicuta bulbifera)
Canada Mayflower (Maianthemum canadense)
Common Spatter Dock (Nuphar variegata)
False Hellebore (Veratrum viride)
Foam-flower (Tiarella cordifolia)
Goldthreads (Coptis trifolia)
Kidney-leaved Buttercup (Ranunculus abortivus)
Marsh St. John's-wort (Triadenum virginicum)*
Pitcher-Plant (Sarracenia purpurea)*
Round-leaved Sundew (Drosera rotundifolia)*
Round-leaved Orchid (Platanthera orbiculata)
Starflower (Lysimachia borealis)
Swamp Saxifrage (Micranthes pensylvanica)
Tufted Loosestrife (Lysimachia thyrsiflora)
Water Avens (Geum rivale)
White Water Lily (Nymphaea odorata)
Wild Calla (Calla palustris)*
Wild Sarsaparilla (Aralia nudicaulis)
Woodlily (Clintonia borealis)
Creeping Snowberry (Gaultheria hispidula)*



Wild Calla (*Calla palustris).*

***Ferns/Allies***
Bracken Fern (Pteridium aquilinum)
Cinnamon Fern (Osmundastrum cinnamomeum)*
Evergreen Wood Fern (Dryopteris intermedia)
Hay-scented Fern (Dennstaedtia punctilobula)
Interrupted Fern (Osmunda claytoniana)
Marginal Wood Fern (Dryopteris marginalis)
Marsh Fern (Thelypteris palustris)*
New York Fern (Thelypteris noveboracensis)
Water Horsetail (Equisetum fluviatile)

***Trees/Shrubs***
Black Spruce (Picea mariana)*
Bog Laurel (Kalmia polifolia)*
Bog Rosemary (Andromeda polifolia var. latifolia)*
Broad-leaved Meadow Sweet (Spiraea alba var. latifolia)*
Highbush Blueberry (Vaccinium corymbosum)*
Large Cranberry (Vaccinium macrocarpon)* rounded leaf
Leatherleaf (Chamaedaphne calyculata)*
Maple-leaved Viburnum (Viburnum acerifolium)
Mountain Holly (Ilex mucronata)
Norway Spruce (Picea abies)
Red Maple (Acer rubrum)
Red Pine (Pinus resinosa)
Sheep Laurel (Kalmia angustifolia)*
Small Cranberry (Vaccinium oxycoccos)* pointed leaf
White Pine (Pinus strobus)
White Spruce (Picea glauca)

***Sedges***
Billings' Sedge (Carex billingsii)*
Bog Sedge (Carex magellanica ssp. irrigua)*
Brownish Sedge (Carex brunnescens)*
Common Fox Sedge (Carex vulpinoidea)
Tussock Cotton Grass (Eriophorum vaginatum)*
Three-fruited Sedge (Carex trisperma)*
Three-way Sedge (Dulichium arundinaceum)
Typical Hoary Sedge (Carex canescens ssp. canescens)*
Wide-leaved Prickly Bog Sedge (Carex atlantica ssp. atlantica)*
Woolly-fruited Sedge (Carex lasiocarpa ssp. americana)*

***Mosses***
Shaggy Moss (Rhytidiadelphus sp.)

***Birds***
Alder Flycatcher
Black-throated Blue Warbler
Canada Warbler
Common Yellow-throat
Ovenbird
Red-winged Blackbird
Swamp Sparrow
White-throated Sparrow
Winter Wren

* = in the dwarf shrub bog

All photos by Steve Young except Wild Calla, by Mike Adamovic.

## New County Records

By Steve Young, NY Natural Heritage Program

In 2017 Jackie Donnelly (see her blog at Saratoga Woods and Waterways) made it a project to collect as many new county records for Saratoga County as she could to fill in blanks in the New York Flora Atlas. First, she used the atlas to find out which species were in the surrounding counties that were not recorded for Saratoga County. This gave her a good idea of what was missing. Next, she spent her days in the field looking for the missing species. Jackie was able to find and collect many "new" species for the county, some of them very common - just never collected as a voucher specimen for an herbarium. Others were rare and were added to the state rare list. Below is a list of the species she collected. There are still some that must be verified and are not listed here and Jackie continues on her quest to find more!

Anyone can do this for their county as follows:

In the Advanced Search link at the top of the atlas go to the advanced page. Under the 'Filter by County' section, put the counties surrounding your county into the 'Counties to Include' list. In the 'Counties to Exclude' list put in your county then hit search. This will give you a list of plants that are in one of the counties bordering yours but not in your county. You can download the list to an excel file or just save the URL.

As I receive new county records from people in the field I put them in an excel file and at the end of the season send them to David Werier who will add them to the Atlas. This process may take a while, but eventually they do show up!

Plants added to the NY Flora Atlas for Saratoga County by Jackie Donnelly:

Acer x freemanii
Aegopodium podagraria
Aesculus hippocastanum
Ajuga reptans
Alcea rosea
Allium tricoccum
Andromeda polifolia
Angelica atropurpurea
Anthriscus sylvestris
Asparagus officinalis
Barbarea vulgaris
Berteroa incana
Betula alleghaniensis
Campsis radicans
Cardamine concatenata
Cardamine maxima
Carex plantaginea
Cicuta maculata
Convallaria majalis
Convolvulus arvense
Cryptotaenia canadensis
Cymbalaria muralis
Dasiphora fruticosa
Diervilla lonicera
Digitalis grandiflora
Draba verna
Echinacea purpurea
Elaeagnus umbellata
Erigeron philadelphicus
Euonymus alatus
Euphorbia cyparissias
Frangula alnus
Fraxinus americana
Galinsoga quadriradiata
Gallium aparine
Geum aleppicum
Geum macrophyllum
Glechoma hederacea
Hesperis matronalis
Hylotelephium telephium
Ilex mucronata
Iris versicolor
Krigia virginica
Lathyrus latifolius
Liriodendron tulipifera
Lonicera morrowii
Luzula acuminata
Lychnis flos-cuculi
Maianthemum stellatum
Malus pumila
Malva moschata
Micranthes virginiensis
Mitella diphylla
Pastinaca sativa
Persicaria nepalensis
Phlox subulata
Physocarpus opulifolius
Picea abies
Portulaca oleracea
Ptelea trifoliata
Ranunculus abortivus
Ranunculus acris
Ranunculus recurvatus
Rhododendron groenlandicum
Rhododendron maximum
Rosa multiflora
Rosa virginiana
Rubus pubescens
Sanguinaria canadensis
Senecio vulgaris
Sisymbrium officinale
Sparganium androcladum
Spergularia rubra
Spiraea alba var. alba
Streptopus lanceolatus
Symphoricarpos albus
Syringa vulgaris
Thalictrum thalictroides
Thuja occidentalis
Trifolium aureum
Trifolium dubium
Trillium grandiflora
Viburnum opulus var. americanum
Vinca minor
Viola blanda
Viola canadensis
Viola cucullata
Viola odorata
Viola rotundifolia
Viola striata
Woodwardia virginica

## Tug Hill Gulf Trip

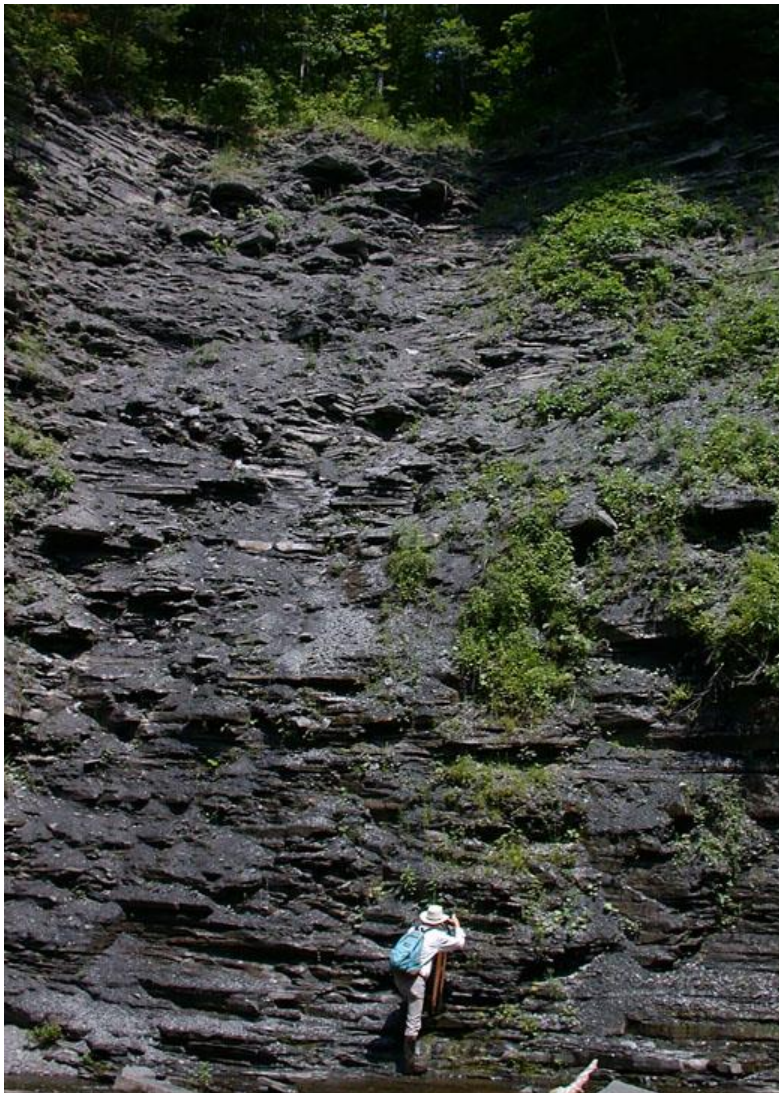
by Anne Johnson

During the hot spell that started at the end of June, it was good to be 1) on the top of the Tug Hill, and 2) in a Gulf. The heat was mitigated by the need to wade in the stream and by the strong breezes that blew around the snake-like twists and turns in the gulf. The trek began at the large patch of giant knotweed (*Reynoutria sachalinensis*) by the bridge in Barnes Corners (see group photo) and continued west into Inman Gulf along and in the stream. The vegetation, while somewhat weedy, was nonetheless of interest to the group of 11 participants. We were able to find many plants to discuss and were lucky to have the additional expertise of a geologist to explain the rock strata and fossils we encountered. Common throughout this gulf were the non-native creeping buttercup (*Ranunculus repens*) and ragged robin (*Lychnis flos-cuculi*). Common native species included fine clumps of twisted sedge (*Carex torta*) and thickets of goldenrods, asters, and green-headed coneflower interspersed with purple-stemmed angelica (*Angelica atropurpurea*). Bulblet fern (*Cystopteris bulbifera*) and harebell (*Campanula rotundifolia*) festooned the walls, and as they became steeper and wetter as we made our way further west we began to see bird's eye primrose (*Primula mistassinica*). After emerging from the gulf we took a short drive to see a wet meadow with nice patches of Hayden's sedge (*Carex haydenii*) and wild sweet William (*Phlox maculata*), after which the group dispersed.

The group in front of the patch of Giant Knotweed (*Reynoutria sachalinensis*).

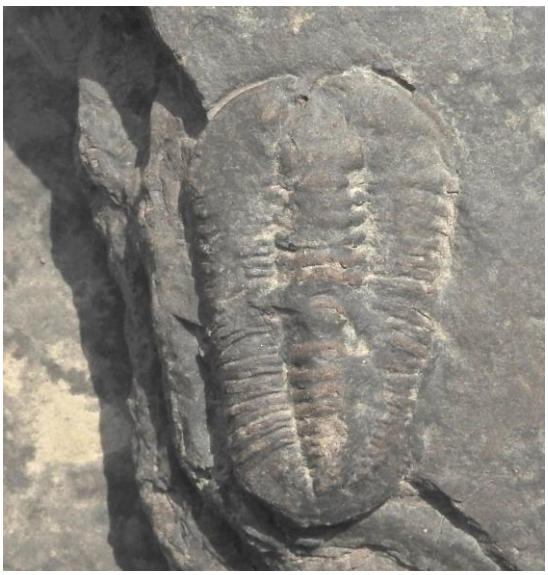
All photos by Michael Hough except the group photo (by Scott Ward) and the trilobite (by Steven Daniel).

A robust clump of *Carex torta*.



Robert Wesley inspecting the dripping walls of Inman Gulf.

Above: What Robert Wesley was looking at - Bird's Eye Primorose (*Primula mistassinica*). Below: a trilobite from the floor of the gulf.



## On the Desecration of Nature

by Tom Rawinski

In the 1960s, the Blackstone River in Massachusetts would turn different colors as the J.J. O'Donnell woolen mill released its effluent dyes. Sewage from the nearby mill village arrived in small settling ponds which overflowed into the river. Michael and I would occasionally hang out down there, shooting muskrats with his BB gun. The smell was accepted as part of life. There were no fish in the Blackstone.

The Clean Water Act of 1972 changed all that, but it was a fight. Industries like J.J.s said it would cost too much money and that jobs would be lost. J.J.s ultimately did go out of business, partly because of the Act and because the textile industry moved overseas. With Federal grant support, a million dollar wastewater treatment plant was built on the floodplain. The smelly ponds were gone and the Blackstone began to recover.

Throughout the country, the Clean Water Act was a triumph for the public good. Rivers and lakes serve the public interest when they are clean and healthy. On the land itself, conservation efforts accelerated as people raced to protect land from development. Some private landowners, such as tree farmers, took pride in being good stewards of the land, not only for their own benefit but also recognizing the broader public interest. A healthy forest could be managed sustainably for timber products while also serving to protect aquifers and biodiversity.

There was a time in my life when polluters could foul the waters, caring little about the consequences to nature and to people. Today, the problem is different; far too many people are allowing far too many deer to foul our forests.

Few noticed decades ago that forests were beginning to suffer from too many deer. People liked deer. Deer were pretty. As deer herds grew, naturalists saw lady's slippers slipping away. Because of deer, trees could no longer successfully regenerate. Ecologists perceived something dire and they warned of bad cascading ecological consequences. All the while, many public and private conservation lands remained off limits to hunting. The problem became especially acute on Long Island where there were no wild predators of deer. In 2013, the East Hampton Town Board adopted its town-wide deer management plan, declaring a deer overabundance emergency. It was a consensus determination that negative impacts of too many deer outweighed positive.

The same story was unfolding across much of the country. This one keystone species, the white-tailed deer, had placed millions of forest acres at risk. It has been called the greatest mistake in the history of wildlife management.

We now face the greatest forest conservation challenge of our time, to return deer-ravaged forests to health. We can begin by trying to understand how we got in this pickle - the unintended consequence of eco-environmental gentrification, anti-hunting sentiment, suburban sprawl (which fragmented forests and gave refuge to deer), overly restrictive hunting regulations and human populations increasingly disconnected from nature.

And we need to understand why this environmental problem is uniquely difficult. Too many people in the conservation world remain petrified by the deer problem, afraid that addressing it will upset constituencies and cost real money. So, they turn a blind eye and do nothing, content to pass it on to the next generation. We remain, as the author Jeremy Griffith reveals, a species in denial. Meanwhile, once beautiful forests have become ecological slums with crumbling infrastructures. Forests are no longer resilient. Forests are disintegrating. Sustainable forestry is totally out of the question.

Despite the magnitude of the challenge, there are rays of hope, primarily at the grassroots level. Communities have become more enlightened and more concerned. Some are making strides in reducing deer populations to more sustainable levels. State wildlife management agencies are being more responsive. Some bright spots, yes; and let us hope for more in the future.

## New York Flora Association 2018 Annual Meeting

SUNDAY, August 12, 10 am - 4 pm at SUNY Oneonta Biological Field Station, **Upland Interpretive Center**, 7027 State Hwy 80, Springfield, NY

Activities will include presentation of the 2017 Plant Conservationist Award, botanizing at the center or other nearby sites, the Annual Meeting and 2018 Board of Directors election, Steve's Plant Quiz, and more! Lunch will be provided. RSVP with number attending to http://annualmeeting@nyflora.org by August 3. Events are open to NYFA members, past and present. Friends and family welcome!

In accordance with the Organization and Bylaws of the New York Flora Association, the Nominating Committee has submitted two new nominees for the board: Mike Adamovic and Kyle Webster.

**Mike Adamovic** is best known as a naturalist and photographer. Over the years, he's come across a bounty of stunning sights in the woods, which words alone are not apt to describe. He enjoys being able to share those experiences with others via photography, an art form that provides the most accurate representation of the natural world. He's had numerous photos and articles featured in a wide array of publications, ranging from the NYS Conservationist to American Forests magazines. His first book, *Hudson Valley Reflections: Illustrated Travel & Field Guide*, was released by Schiffer Publishing in June 2017. Aside from running his photography business, Adamovic Nature Photography, he spends his time working on ecological restoration projects across the Hudson Valley as part of the team at One Nature, LLC in Beacon, NY.

**Kyle Webster** is a passionate outdoor enthusiast who loves to backpack and study our native flora. He has an AAS in Horticulture, an AS in Sciences (FLCC) and a BS in Conservation Biology from SUNY-ESF. He currently works for NY State Parks as the New York Works project coordinator and at the Oak Unit Restoration project of Cayuga Lake. He has been active in conservation and restoration ecology efforts at Ganondagan State Parks, and an active participant in many NYFA outings and NYFA plant identification workshops over the last several years.

In addition to these new Directors, whose three-year terms will commence at the Annual Meeting, the Nominating Committee is recommending that the following current Directors whose terms expire in 2018 return for another three-year term: Steve Young, Richard Ring, and Daniel Spada. Write-in candidates are also accepted. Please cast your ballots by mail, email, or other form of technology, **prior to, or in person, at the NYFA Annual Meeting.**

**New York Flora Association**
**Ballot 2018**

**For Director (two vacancies and three renewals):**

| | | | |
|---|---|---|---|
| Mike Adamovic | ☐ | Steve Young | ☐ |
| Kyle Webster | ☐ | Richard Ring | ☐ |
| | | Daniel Spada | ☐ |

All NYFA members are eligible to vote. Send ballot to: NYFA, Box 122, Albany, NY, by August 5, 2018. To vote via e-mail, submit your choices to: annualmeeting@nyflora.org

The Indian paintbrush (*Castilleja coccinea*) display at Chaumont was spectacular this year. Photo by Steven Daniel.

Find us on **Facebook** Follow us on instagram and **@newyorkflora**

**And check out what's on our Website and Blog**
**Find them at www.nyflora.org and www.nyfablog.org**

**NEW YORK FLORA ASSOCIATION MEMBERSHIP FORM 2018**
**We are a 501c3 Tax Deductible Organization!**

Annual Membership dues:
_____ New $20 Make checks payable to the **New York Flora Association**
_____ Renewal $20 per year
_____ Renewal with paper option $30 per year (**only** for those already receiving printed newsletters)
_____ New Student Members (Free the First Year) School: _____
_____ Student Members (continuing) $10 School: _____
_____ Additional donation to support NYFA efforts like botany presentation awards and small grants.
_____ **Total** $

Name:_____

Address:_____

Address:_____ County:_____

City: _____ State: _____Zip Code:_____

E-mail address: _____

**We are only accepting credit card payments through PayPal at this time. If you would like to use a credit card, please use the link on our website: http://www.nyflora.org/join-make-a-donation/**

**Mail this form to: NY Flora Association, PO Box 122, Albany, NY 12201-0122**
***Thank you for supporting NYFA and the flora of New York State***

**NY Flora Association**
**PO Box 122**
**Albany, NY 12201-0122**