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Winter 2021

Mitchelliana

New York Flora Association Newsletter Winter 2021

Note from NYFA Secretary Steve Young: This month you will notice our newsletter has a new name: Mitchelliana. The name change is to honor Dick Mitchell, our last state botanist, who was a founder of the New York Flora Association and the editor of the newsletter for many years. We hope you enjoy this and future issues!

Articles Inside:

Editor's Note: Just a reminder - in addition to the articles we print in this newsletter there are periodically interesting botanical tid-bits to be found on the NYFA blog, so be sure to check it out at: https://nyflora.org/nyfa-blog-2/

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Rediscovering Historical Botanical Records - 2020 (Re)finds

by Steven Daniel

One of the many joys of botanizing is the chance to discover new state or county records. Another is to rediscover species for which there are historical records, but haven't been reported for a long time. With the latter objective in mind, Anne Johnson and I looked for a couple of such species in 2020.

One species was the state rare (S1/S2) Douglas' knotweed, *Polygonum douglasii*. This is a species primarily of western North America with scattered locations in the Northeast, mostly on rocky outcrops. There were two old records for St. Lawrence County, the most recent being one from August 1923, described in an article by Fernald and Wiegand (Rhodora, Vol. 25, No. 300) as found on "dry sandstone or gneiss ledges, Narrows Island, Black Lake, St. Lawrence County." Anne knew that Narrows Island was the old name for what is now called Booth's Island. In late July, we put our canoe and kayak in and looked for promising rocky outcrops along the island shoreline. We found a few plants at the first rocky outcrop we stopped at, and no others. In its understated glory, it was growing among lichens in full sun. How exciting - a species rare in NY persisting for the past 100 years, likely in the same location where Fernald and Wiegand found it. May it continue for the next 100!

Polygonum douglasii growing among lichens on a rocky outcrop, Black Lake, St. Lawrence County. Inset: close-up of flower.

Our next 'target' was an aquatic, alga pondweed (*Potamogeton confervoides*), a distinctive species of softwater lakes. It was collected by Muenscher and Clausen in 1933. In his "Aquatic Vegetation of the Racquette River Watershed" (1934), a part of a Biological Survey of the Racquette River Watershed, Muenscher writes that *P. confervoides* formed "dense mats on mucky bottom of Marsh Pond, near Piercefield." This is a 'watch list' (S3) species in New York, where there are several records in lakes in the Adirondacks, Catskills, and on Long Island. But neither of us had seen this distinctive, very narrow-leaved species in New York. Marsh Pond was the only known record for St. Lawrence County, the flora of which Anne has been assiduously cataloguing for the past 40 years. Joined by Dan Spada, we headed to Marsh Pond in early September. We weren't able to put our boats in, but we walked along the shore of the pond and saw a suspicious aquatic plant that had been uprooted and washed up along the shoreline. We collected a bit, and took it back to our respective 'labs' where we could study it more carefully. Sure enough - we had indeed (re)found *P. confervoides*, with its distinctive fan-shaped branches of narrow leaves, seen easily when we floated it in water.

Potamogeton confervoides, showing its distinctive, fan-shaped branches of narrow leaves.

Our last historical 'target' happened more or less by chance. I was wondering if there might be New York records of *Hudsonia tomentosa* - a sand-loving coastal plain species, that were not from the coastal plain. Disjuncts, in other words. I noticed that Stanley Smith, former Curator of Botany at the NYS Museum, had recorded this species in 1958 from "Big Wolf Pond, Franklin County." I figured that Big Wolf Lake, near Tupper Lake, was the likely site. Today Big Wolf is a private lake, within the boundaries of a Landowners Association. I asked Dan Spada, who, after a career with the Adirondack Park Agency, has multiple contacts and friends throughout the region, if he might know anyone there. Dan contacted a friend, Sally Hart, who graciously offered to help out. In late September we met Sally at Big Wolf, where she suggested taking us around the lakeshore in her powerboat, while we scanned the shoreline for anything suspicious. The lake looked like a classic Adirondack Lake, not the kind of place I expected to find a sand-loving coastal plain plant. Yet near the end of our circumnavigation, we saw, with binoculars, some plants that looked intriguing. We disembarked and there it was - *Hudsonia tomentosa*, growing in sand! In this relatively small area of the lake shore we found quite a few plants, which was encouraging. Of course a question in situations like this is how these plants appear so far out of their "typical" range. This is a difficult question to answer - this species is known along Lake Champlain in Vermont, and there

are records near Plattsburgh as well. It is also known to occur in sand in the Ottawa region and farther west. So changes in the landscape after glaciation certainly must come into play - but the specifics remain to be worked out!

Voucher collections of these species will be deposited at the Bailey Herbarium, Cornell University.

Close-up of *H. tomentosa*.

Steven Daniel, Anne Johnson, and Dan Spada (left to right) among the *Hudsonia* (photo by Sally Hart).

Patterns of Change in Vegetation and Forest Structure in the Pine Barrens of Long Island, NY - 2020 New York Flora Association Research Award

by Joanna Lumbsden-Pinto, SUNY College of Environmental Science and Forestry

Introduction

The Long Island Central Pine Barrens (LICPB) represents a unique ecosystem embedded in some of the most urbanized landscapes in the US -- Long Island and adjacent New York City. A diverse mosaic of pitch pine and oak forests, coastal ponds, marshes, grasslands, and streams, LICPB overlies Long Island's freshwater aquifers and helps to purify drinking water. LICPB depends on periodic fires for its renewal and is a good example of other pine barrens ecosystems in the Northeastern US (U.S. Geological Survey). Fire is needed to release nutrients, trigger germination of seedlings and eliminate competing species, increase food availability, and provide spaces for a diversity of wildlife to inhabit these areas (Forman & Boerner, 1981; Dovciak et al., 2013; Lee et al., 2018).

Despite fire's importance, LICPB is currently threatened by catastrophic wildfires due to fuel accumulation as forests have become more dense following decades of fire suppression (Olsvig et al., 1979;

Jordan et al., 2003). When fire suppression occurs, the leaf litter and fallen trees become fuel, making the forest liable to ignite and cause irreversible or long-term damage to the forest and to human properties, about $8.6 billion/year in direct property loss in the US (NESEC. n.d; Hiers et al., 2020). Unfortunately, wildfires and forest regeneration failure are expected to increase as the regional climate becomes warmer and drier due to climate change and urban heat island effects associated with urban sprawl (Brown & Johnstone, 2012; Fairman et al., 2018; Stevens-Rumann et al., 2018). At present, the complex relationships between fire, forest structure, and climate in the LICPB and other fire-dependent ecosystems remain poorly understood due to a scarcity of detailed historical information (Marschall et al., 2016). Paying close attention to both fire history and patterns of climate on small areas (microclimate) and the relationship between the two could contribute to understanding vegetation dynamics in the LICPB, as well as inform management, conservation, and restoration strategies for this rare ecosystem.

The main purpose of this research was to: 1) resurvey forty-two forest health monitoring plots and quantify vegetation changes across the LICPB since the first survey in 2005-2006; and 2) monitor microclimate across the LICPB (using sensors) to understand how the forest cover affects local and regional air temperature and how climate may in turn affect the ability of pine barrens forests to maintain themselves in the context of warming climate.

We were able to survey the forty-two monitoring plots and establish ten new plots in burned areas across the LICPB and prepare climate sensors (iButtons) and place them in thirty-eight plots across the LICPB for two months.

Results

The preliminary results indicate that the average temperature recorded by the microclimate sensors across the LICPB from the months of July to September was 21.6 °C (70.9 °F). This result is very similar to the average recorded by the weather station at Brookhaven National Laboratory (BNL Meteorological Services) - 21.7 °C (71.1 °F). The records from BNL were taken from sensors located two meters above the ground, one meter higher than the sensors examined in this study (Figure 1).

Figure 1. Forest types and climate sensors setting (two iButtons per cup, at 1 m and 0.5 m above the ground). From left to right: Coastal Oak, Oak-Pine, Pine-Oak, Pitch Pine-Scrub Oak.

After graphing the average mean values by forest types, we observed a minimal difference between the highest and lowest average temperatures (0.6 °C); Coastal Oak and Oak-Pine forests showed the highest values and Pine-Oak and Pitch Pine- Scrub Oak showed the lowest temperatures. When comparing these values with percent canopy cover in those forests, we observed the same trend. Coastal oak and Oak-Pine forests have the highest canopy cover and Pine-Oak and Pitch Pine-Scrub Oak are characterized as being

more open (Figure 3). This result is unexpected, since we would expect that more canopy cover would lead to lower temperatures in the understory and that the more open forests would be warmer, but this is not what these initial results show (Figure 2). A possible explanation could be that pine-dominated forests generally have an evident layer of shrubs between 2 to 5 meters tall, and this might provide a fresher microclimate, meaning lower temperatures near the ground.

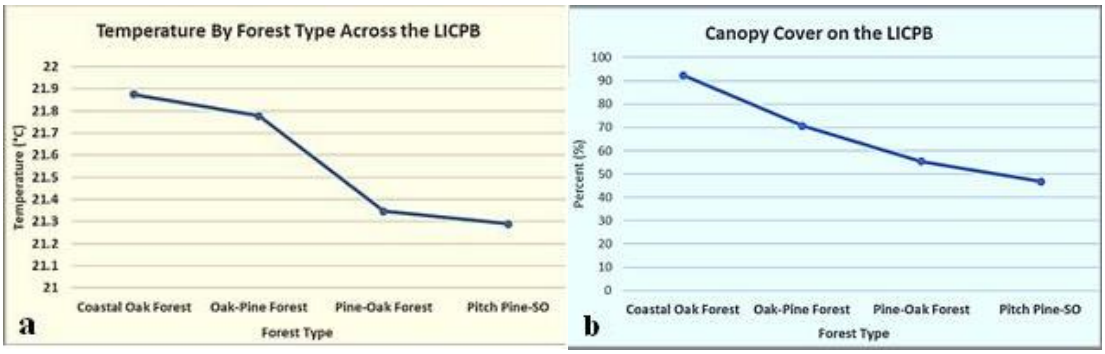

Figure 2. a. Average temperature recorded from sensors and b. Canopy cover percentage.

Conclusion

The results shown in this report are preliminary and will continue to develop as part of my doctoral dissertation. It is important to mention that due to the global pandemic (COVID-19) there were a variety of challenges added to other unknowns we normally face when doing fieldwork. The late start of data collection and adjusting the field work due to COVID-19 guidelines contributed to the field work being finished much later than originally planned. Figure 4 is a photo with me (far right) and the three interns who helped on this work. Perhaps the most important accomplishment of this summer is that we were able to finish the data collection successfully, a work which was done last year with eight interns, in midst of a global pandemic.

Figures 3. Pitch Pine canopy, and Figure 4. Field crew.

Acknowledgements

I would like to thank the New York Flora Association for their support which contributed to making this project possible. I express gratitude to my advisor, Dr. Martin Dovciak for kindly supporting and encouraging me throughout the completion of the summer work during these unprecedented times. I also want to extend my deepest gratitude to the Central Pine Barrens Commission, represented by Polly Weigand and Shaun Ziegler, for supporting this project in various ways and to the interns who helped in collecting and entering the data. I would also like to thank Brookhaven National Laboratory, especially Tim Green and Kathy Schwager who supported on the execution of this project. Lastly, I would like to thank Suffolk County for their assistance in providing accommodation and to The New York State Department of Environmental Conservation, represented by John Wernet for being helpful in providing access to their land.

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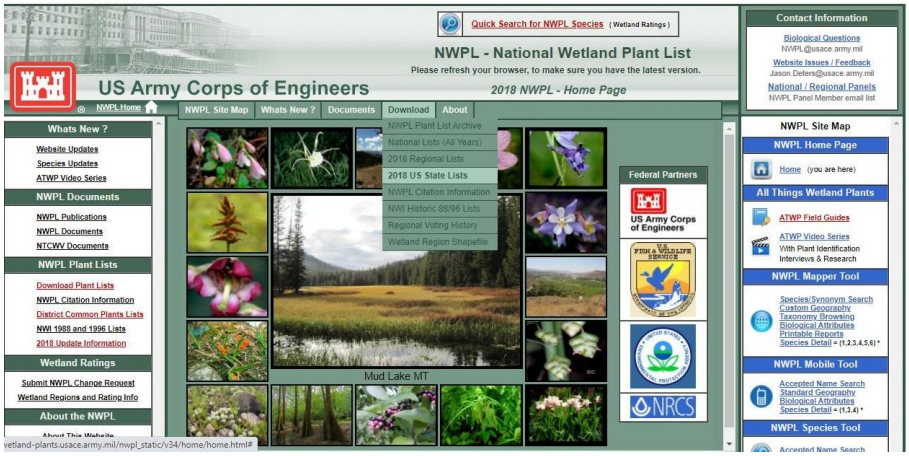
Update to the National Wetland Plant List and Related Changes to New York Flora Atlas

by Joseph McMullen, NYFA Board Member, Joymcmullen2@msn.com

Early last year, the U.S. Army Corps of Engineers (Corps) released an update to the National Wetland Plant List (NWPL), which is a list of the indicator status ratings of plants. This updated list is referred to as the 2018 list (USACE 2018). It became effective on May 18, 2020 and can be obtained at http://wetland-plants.usace.army.mil/. What is nice about this website is that you can view and print out a list of plants by state (e.g., those that specifically occur in New York). Although the newly updated list is an important reference to those performing wetlands delineations and has somewhat updated the plant nomenclature, no indicator status rating changes were made for species in our region.



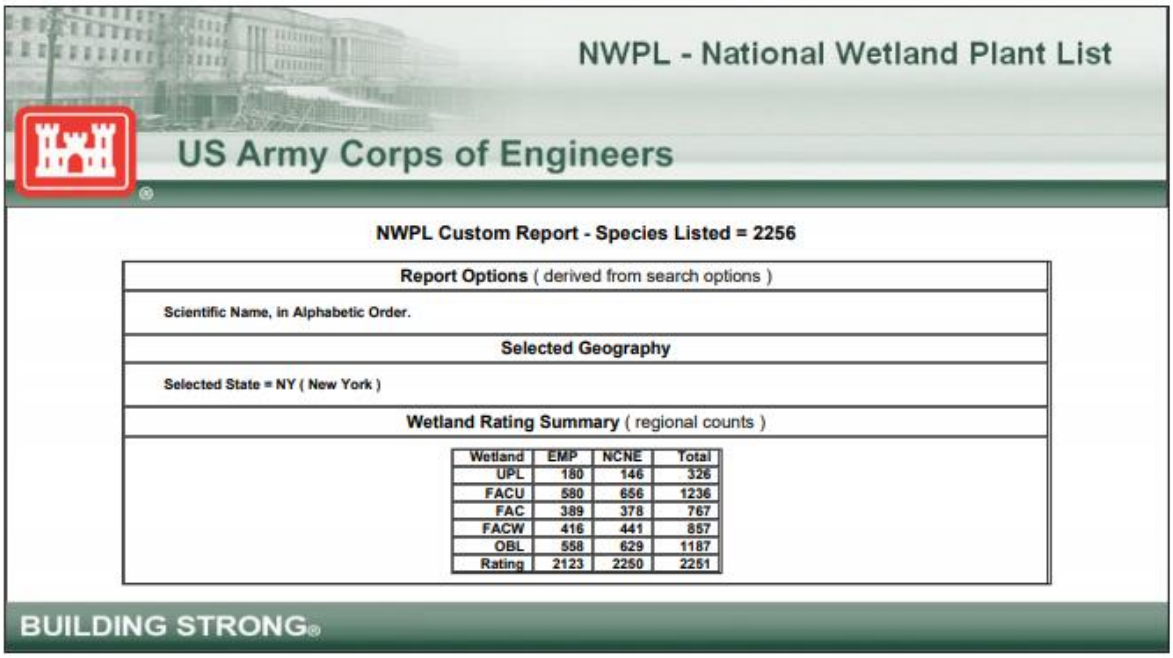
Screen shot of the NWPL web site.

The NWPL assigns an indicator status rating to plant taxa based on a species likelihood of occurring in wetlands versus non-wetlands. The rating is the perceived measure of a plant's fidelity to wetlands or uplands habitats. In other words, how faithful a plant is to occurring in a wetland or an upland. There are five categories of indicator status ratings, which are described in Lichvar et al. (2012) as follows.

OBL: Obligate Wetland Plant – almost always occur in wetlands.
FACW: Facultative Wetland Plant – usually occur in wetlands, but may occur in non-wetlands.
FAC: Facultative Plant – occur in wetlands and non-wetlands.
FACU: Facultative Upland Plant – usually occur in non-wetlands, but may occur in wetlands.
UPL: Upland Plant – almost always occur in non-wetlands.

Indicator status ratings in the NWPL are provided by geographic regions. Most of New York is within the Northcentral and Northeast Region (NCNE), with a very small area (about 2%) of the state within the Allegheny River drainage basin in portions of Cattaraugus and Allegany counties being in the Eastern Mountains and Piedmont Region (EMP). There are some differences in the number of species provided status ratings between these two regions, as well as differences in ratings for individual species.

As indicated by the accompanying NWPL chart, there are 2123 species in NY provided a status rating in the EMP region and 2250 in the NCNE region. This difference in the number of the rated species is due to the distributional occurrence of species. A number of New York's more northern or higher elevation species do not occur in the EMP region. An example would be fir clubmoss (*Huperzia selago*), which occurs in northern NY, but does not occur in the Allegheny drainage basin or elsewhere southerly. Also, certain rare species with limited distribution in NY do not occur in the Allegheny drainage basin. An example would be muskroot (*Adoxa moschatellina*), which is only recorded in Green and Delaware counties of NY.


NWPL - National Wetland Plant List

US Army Corps of Engineers

NWPL Custom Report - Species Listed = 2256

Report Options (derived from search options)

Scientific Name, in Alphabetic Order.

Selected Geography

Selected State = NY (New York)

Wetland Rating Summary (regional counts)

Wetland	EMP	NCNE	Total
UPL	180	146	326
FACU	580	656	1236
FAC	389	378	767
FACW	416	441	857
OBL	558	629	1187
Rating	2123	2250	2251

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Scientific Name	Authorship	EMP	NCNE	Common Name
Abies balsamea	(L.) P. Mill.	FAC	FAC	Balsam Fir
Abutilon theophrasti	Medik.	UPL	FACU	Velvetleaf
Acalypha gracilens	Gray	FAC	FACU	Slender Three-Seed-Mercury
Acalypha rhomboidea	Raf.	FACU	FACU	Common Three-Seed-Mercury
Acalypha virginica	L.	FACU	FACU	Virginia Three-Seed-Mercury

Sample screen shot from NWPL website.

There are about 150 species listed for NY in the NWPL with a different status rating in the two regions (e.g., FAC in one region and FACU in the other). These differences can be important when determining hydrophytic vegetation using the dominance test or prevalence index under federal wetland methodologies. So, it is important to be aware of the applicable region when performing wetlands delineations in the state.

Indicator status ratings are provided in the New York Flora Atlas (Weldy et al. 2020) for those species for which a status rating has been assigned. However, the Atlas was woefully out of date with the updated ratings, and we went through the process of updating it to the current ratings list. Because of differences in nomenclature and subspecies recognition between the NWPL and the Atlas, it was not a simple process. I helped with ushering the changes along and developed descriptions used in the Atlas, but the real time-consuming work with this update was performed by Rosemarie Parker of Ithaca and David Werier. So, thanks to both Rosemarie and David for their efforts.

In the new Atlas update, a species' indicator status rating is provided, where appropriate, for both the NCNE and EMP regions. If a rating is only provided for the NCNE region in the Atlas, then it is not listed in the NWPL for the EMP region of NY. Generally, if no rating is provided, then the species is not listed in the NWPL, and the conventional assumption is that this is a UPL species. Decisions were required for subspecies ratings. Take a look at how it turned out in the Atlas (http://www.newyork.plantatlas.usf.edu/).

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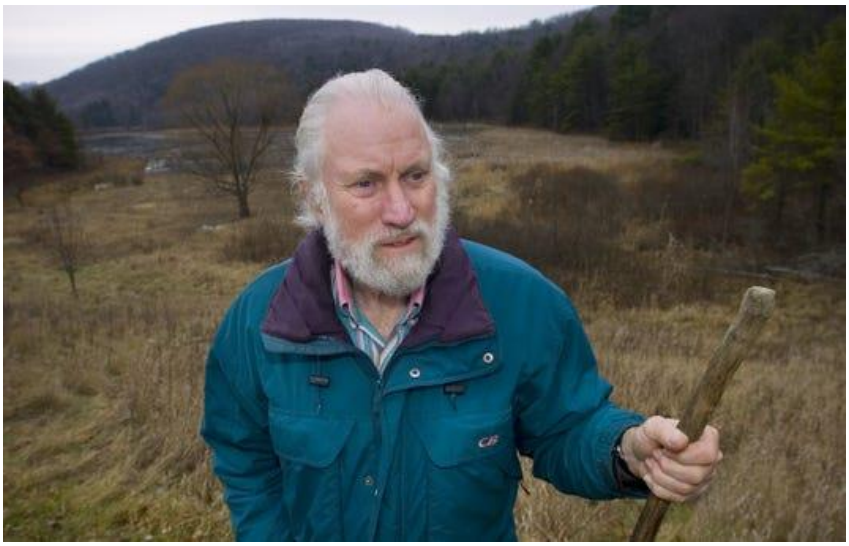
Richard Andrus - 2020 Plant Conservationist of the Year Recipient

by Connie Tedesco

At the annual meeting of the New York Flora Association on September 27, 2020, Dr. Richard (Dick) E. Andrus, retired Professor Emeritus at Binghamton University, was posthumously awarded the 2019 NYFA Plant Conservationist of the Year Award. He passed away on April 5, 2020 at the age of 78 from cancer.

Dr. Andrus, a graduate of RPI and ESF, began and developed the Environmental Studies Program at SUNY Binghamton in 1973. He was a world renowned bryologist, specializing in *Sphagnum*, with numerous publications to his credit, including several contributions specific to New York State. He was also a chief contributor to the Sphagnaceae treatment in Flora of North America. Dick led numerous forays for various bryological groups and mentored many young botanists. With his colleague, Dr. Julian Shepherd, he helped to establish the Binghamton University Nature Preserve. After 45 years of teaching, Dick retired in

2018, donating the bulk of his collections to Duke University.



Dick was also an active member of the Binghamton community where he resided, participating in several community organizations, including VINES (Volunteers Improving Neighborhood Environments), the City Shade Tree Commission and NOFA (Northeast Organic Farming Association). He practiced what he preached - environmental advocacy and sustainable living.

In his honor, Binghamton University has established a scholarship, the "Andrus Field Research Program", to support student research. Donations can be sent to the Binghamton University Foundation, P.O. Box 6005, Binghamton NY 13902. Please designate "Andrus Field Research Program" with the donation.

Dick actively bird-watching at Poco Sol, Costa Rica.

A Flora for New York State

by David Werier; Nakita@lightlink.com

New York State's only complete flora dates back almost 200 years to Torrey's (1843) A Flora of the State of New York. Since that time, Dick Mitchell and colleagues (1978–1993) began working on a modern flora, what they called the Contributions to a Flora of New York State. While their work was fantastic, it was never completed and now is much out of date. After the publication of my Catalogue of the Vascular Plants of New York State (2017), I was approached by an anonymous donor who was interested in funding me to work on a modern flora for the state. After thinking about and discussing this idea with colleagues, I agreed to take on the challenge!

I have begun work on the flora and wanted to let others know. The multi-year New York Flora Project, as I am calling it, will result in an up-to-date modern flora. It won't be as grand as Dick Mitchell's Contributions, but will include an accounting of all the wild plants of the state with identification keys, distribution information, habitat details, extra notes, and more. I am very excited that we will have our very own flora and won't have to rely on out of state and/or larger treatments to identify and understand the plants that grow wild in New York.

My hope is to make this as strong a publication as possible. To that end, I can use your assistance. I will need your help testing out keys, understanding what nonnative species are truly naturalized in the state versus simply waifs, flushing out distributions of species, determining the status of rare native species, understanding the frequency of species in different regions of the state, and more. If you are interested in helping, please send me an email. Also, as part of this project I am conducting extensive field work throughout the state. If you have a site you would like me to visit, let me know.

It is important to mention that NYFA agreed to have the donations for the project funnel through their organization. Because I am on the NYFA board, there was a clear conflict of interest. I made that known to the rest of the board and agreed to step down from the board if necessary. In consultation with lawyers, the board determined that it was permissible for me to remain on the board, although I must be absent from discussions and decisions related to funding for the project.

As we are all acutely aware, the wild plants of New York are an important and wonderful part of our surroundings. It is a pleasure and honor to work towards elucidating them further via a flora.

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2020 Additions to the St. Lawrence County Flora

by Anne Johnson

Each year in this newsletter I report new plants added to the list of those already known in our county. The past field season resulted in the following 21 "new" species being added to our county flora, resulting in an overall count of 1485 (in 2009 we had recorded 1347).

Acorus calamus (Old World Sweetflag). Steven Daniel found this non-native sweetflag growing in a roadside wetland in Trout Lake State Forest.

Andropogon virginicus* var. *virginicus (Broom Sedge Bluestem). David Werier noticed a stand of this grass growing in a sandy field behind the Rossie Community Center on CR 3.

Callitriche heterophyllum* ssp. *heterophyllum (Large Water Starwort). Steven Daniel collected this small aquatic in a backwater of the Tooley Pond Outlet.

Descurainia sophia (Fixweed). This non-native waif was found growing in a harvested but abandoned corn field in the town of Waddington.

Digitaria ciliaris* var. *ciliaris (Southern Crabgrass). David Werier alerted us to this species of crabgrass. It does not look too different from the common *D. sanguinalis* until you take a closer look through a hand lens. Once alerted to its presence, we looked for it and turned it up in a number of roadside and weedy places in the county. See David's NYFA blog: https://nyflora.org/the-nonnative-crab-grasses-digitaria-of-new-york/.

Dyssodia papposa (Fetid Marigold). A few short, single strands of this unique composite were found growing on the very edge of state route 12 in the town of Morristown. If you live in an area where you see the nice, compact tufts of orangey color on the sides of major highways you would be surprised to see just a few strands by themselves, but this may be how it starts. It is apparently spreading north from US 81 in Jefferson County.

Elymus villosus* var. *villosus (Downy Wild Rye). While weeding folders of pressed plant specimens, I came across this distinctly villous rye, which somehow was never added to our database of county plants. It was collected back in 1996 in a bottomland forest on the west shore of the Grasse River near Canton.

Eragrostis pilosa* var. *pilosa (India Love Grass) Another introduced grass that David Werier noticed on a trip through the county. He distinguishes it from the very similar *E. pectinacea* by its "adorable first glume".

Hypericum virginicum (Virginia Marsh St. John's-wort). Steven Daniel noted this species in flower along the shore of Moon Lake in Wolf Lake SF in Edwards, and subsequently found it in fruit in Cold Springs SF.

Iberis umbellata (Globe Candytuft). Steven Daniel noticed this escapee on a roadside near camps at Cedar Lake.

Isoetes tuckermanii (Tuckerman's Quillwort). Steven Daniel observed lots of this quillwort on the sandy bottom of Crystal Lake in Aldrich Pond Wild Forest while snorkeling. Determination was confirmed by Daniel Brunton.

Liparis liliifolia (Lily-leaved Twayblade) (S1). Steven Daniel noticed a suspicious *Liparis* with past flowers and fruit in 2019 in a dense shrub swamp in Hickory Lake State Forest. He returned in 2020 a couple weeks earlier and found this species growing side by side with the more common *L. loeselii*.

Panicum philadelphicum* ssp. *gattingeri (Gattinger's Witch Grass). Another find by David Werier on one of his whirlwind trips across the state in search of different grass species, this one was on a roadside in Rossie.

Polygonum douglasii (Douglas's Knotweed) (S1S2). Not new to the county, but a relocation of 1922 record of Fernald and Wiegand, see the lead article in this newsletter.

Potamogeton confervoides (Alga Pondweed) (S3). Another relocation of an historic record, see the lead article in this newsletter.

Potentilla intermedia (Russian Cinquefoil). Steven Daniel tentatively identified this species in 2019 at Stammer Lake State Forest, Edwards. In 2020 he confirmed it there, and since then we have tuned into it and found it in two other towns. However, we have not turned up any of its close relative, *P. inclinata*.

Rosa virginiana (Virginia Rose). An attractive and tall (up to a meter) shrubby rose found on a rocky shore along Crooked Creek, Hammond.

Rubus phoenicolasius (Wineberry). Found growing in a large patch on the side slope of a newly created boat launch on the west shore of the Grasse River, just west of the village of Massena.

Tripleurospermum inodorum (Scentless Mayweed). Martha Grow noticed quite a patch of this growing in the poor soil of an old sandy field in Stockholm.

Veronica anagallis-aquatica (Water Speedwell). Observed filling a narrow ditch along the paved walking trail on the west side of the Oswegatchie River in the city of Ogdensburg.

Utricularia radiata (Small Swollen Bladderwort) (S2). Steven Daniel noted several flowering (and vegetative) plants while canoeing on the Raquette River around Sols Island in Piercefield. An exciting find, as hours earlier, we had been talking about this species with Dan Spada, who mentioned he had seen it in Tupper Lake in Franklin County.

Utricularia radiata. Photos by Steven Daniel.

NYFA Botany Quiz 2020 by Steve Young

If you didn't make our annual meeting in 2020 you missed out on my yearly botany quiz. But now, for the first time, we publish it in the newsletter so it's available to everyone! Good luck! (Answers after the annual meeting zoom photo on the next page).

1. In David Werier's catalogue of the vascular plants of New York State, which family comes after the Aster family? 1. Campanulaceae 2. Cyperaceae 3. Fabaceae 4. Polygonaceae.

2. The leaves of which of these plants are most similar to *Trillium* leaves. 1. *Uvularia* 2. *Arisaema* 3. *Caulophyllum* 4. *Symplocarpus*.

3. Which of the following can be found in plant cells, but not animal cells? 1. Ribosomes 2. cell membrane 3. mitochondria 4. chloroplasts.

4. In which institution is the Eckert herbarium housed?

5. What is the present genus name for barren strawberry that used to be in the genus Waldsteinia?

6. What kind of carbon fixation is found in many succulent plants? 1. C4 2. C3 3. CAM.

7. In dicot leaves they are two types of mesophyll cells. Can you name one?

8. If I collected a plant in Delaware County and then traveled down the Delaware River to the next county, what county would I be in?

9. The ovules arise from what part of the fruit? Terms describing this part can be parietal, axile, basal, or free central.

10. Which habitat would I most likely find *Sagittaria subulata* in? 1. alpine meadow 2. red maple swamp 3. freshwater intertidal mudflat 4. shallow emergent marsh.

11. If I were collecting plants in Rockland County which eco-region would I be in? 1. Ridge and Valley 2. Northern Piedmont 3. Northeastern Coastal Zone 4. Northern Allegheny Plateau.

12. Prairie fringed orchid, *Platanthera leucophaea*, is a federally threatened orchid that has historically been found in New York but is presently not extant. What is another federally threatened rare orchid that presently exists in New York?

13. Who is considered the first female botanist in New York and the nation?

14. What does the term suberose mean? 1. glossy leaf surface 2. spines on the leaf petiole 3. short ragged leaf margin 4. corky in texture.

15. When a new plant species is described, an herbarium specimen is designated as the holotype. If there are duplicate specimens of the holotype, what are they called? 1. Syntypes 2. Paratypes 3. Isotypes 4. Neotypes.

16. When plant ecologists for NYNHP do releve plots to record the plants that characterize ecological communities, how large are they? 1. a 50x50 meter square 2. a 10x10 meter square 3. a circle 10 meters in diameter 4. 5 circles 2 meters in diameter.

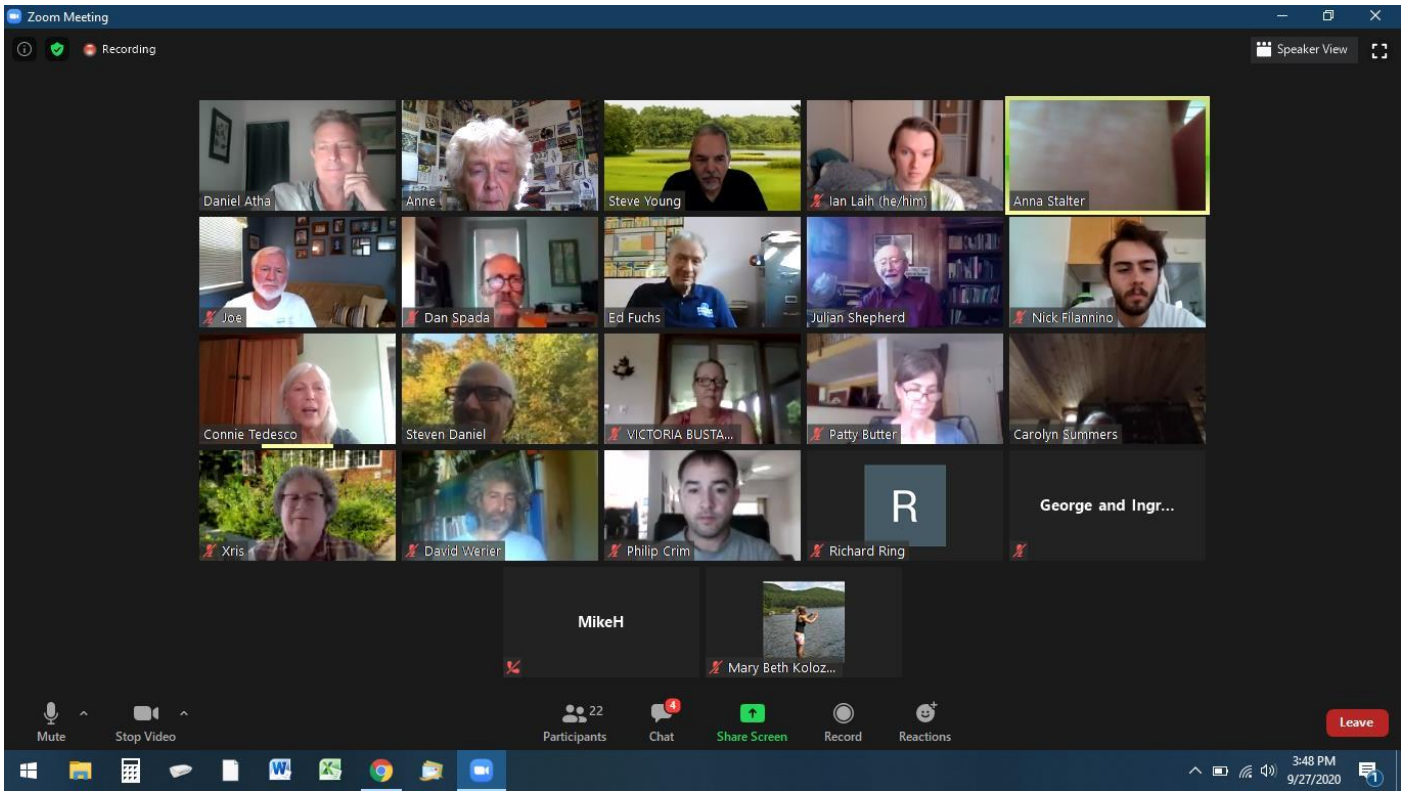
17. Which of these hawkweeds is not native? 1. *Hieracium venosum* rattlesnake 2. *Hieracium gronovii* beaked 3. *Hieracium kalmii* Canada 4. *Hieracium maculatum* spotted.

18. What does the scientific name *pulchellum* mean?

19. If you read the new NYFA website you would know who gave an enthusiastic speech supporting NYFA at the organizational meeting in 1988. Who was he? 1. Arthur Cronquist 2. Mario Cuomo 3. Stanley Smith 4. John Torrey.

20. In what year was state botanist Homer House's checklist of the flora published? 1. 1920 2. 1924 3. 1930 4. 1934.

Bonus Question! In the present Gleason and Cronquist manual index every species is listed under the genus name. In the 1991 edition not every species is listed for all the genera. How many species (not just synonyms) did a genus need to have before each species got listed in the index (within 1)?



Answers: 1) Campanulaceae 2) *Arisaema* 3) chloroplasts 4) SUNY Buffalo State College 5) Geum 6) CAM 7) Palisade or spongy 8) Sullivan 9) Placenta 10) freshwater intertidal mudflat 11) Northern Piedmont 12) *Isotria medeoloides* 13) Jane Colden 14) corky in texture 15) Isotypes 16) square 10x10 meters 17) *Hieracium maculatum* 18) Pretty or beautiful 19) Arthur Cronquist 20) 1924 Bonus) 13.

Photo of a travelling botanist. Note the rather full plant press to the left of the kayak. Photo by Steven Daniel.

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