



Field Botanists of Ontario

NEWSLETTER

Fall-Winter 2020 Volume 32 (3-4)



Spring Avens

Oak-hickory woodlands

2020 Student Award

In Memoriam: Bill Crowley

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President's Message

As 2020 comes to an end, we look to next year's field season with hope that our collective situation has improved and that field trips are running again.

Our first virtual AGM was held in October. Thank you to everyone who attended, it was nice to have so much participation. The *FBO Student Award* was presented to Caitlyn Lyons for her graduate research at the University of Western Ontario. Caitlyn presented a brief summary of her study of the effects of warming temperatures on peatland plant communities in northern Ontario. A new FBO award for botanical photography in Ontario was voted in – the *Crowley Award*. It is named after the late Bill Crowley in recognition of his long service to the FBO and his passion for photography. To manage our growing number of awards, we also voted in a new board position, Awards Co-ordinator, who will administer and present the three FBO awards (*Crowley Award*, *FBO Student Award*, and *Goldie Award*).

Several changes to the board were also voted in at the AGM. Larry Lebert stepped down after three years as Treasurer (2017-2020). Many thanks for your service, Larry. Leanne Wallis has kindly moved from Director to Treasurer. Will Van Hemessen has moved from Director to be our first Awards Co-ordinator. We also welcomed two new Directors, Pat Deacon and Paul Sokoloff. They have both been active members of the FBO for several years. Many thanks to everyone that has taken on these new roles. For any members interested in serving on the board, please don't hesitate to contact us for more information.

The core content of the FBO Newsletter is field trip reports. However, since there were no trips this year, we are looking for content. If you have outstanding trip reports we would be grateful to receive them. We also encourage the submission of articles on other aspects of botany in Ontario, such as the discovery of interesting species or habitats.

The snow may have arrived, but there are still plenty of cryptogams and buds to explore. I hope you continue to get out and botanize.

Yours in the Outdoors,

Troy

On the cover: Spring Avens flowers and fruits. Note small yellow petals and fruiting head elevated above the sepals on a short stalk. Photo: Patrick Deacon, 21 May 2019, Essex County, Ontario.

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

Field Botanists of Ontario website: www.fieldbotanistsofontario.com

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

Trip location maps generated using NatGeo Mapmaker.

Field Botanists of Ontario

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

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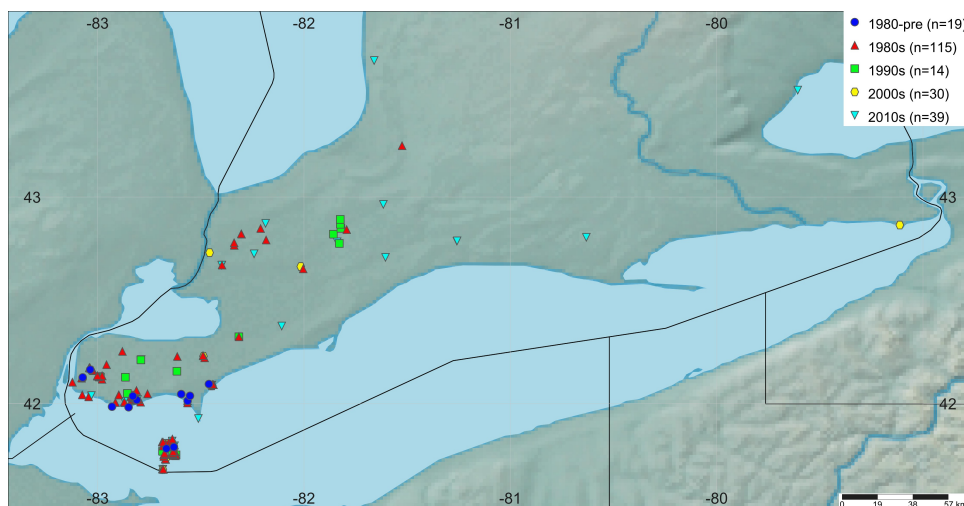


From the Editor

Great thanks are extended to the contributors of the present Newsletter! Despite having no trip reports, the bread-and-butter of the publication, I think that we have managed to put together a comprehensive issue which will be of great value to the members. Next spring, when the province hopefully emerges from the darkness of 2020 A.D., botanists will again disperse into the wilderness in search of interesting plants, like, looking for Spring Avens in the southwest, or exploring the dry oak-hickory woods in the south-east: the two papers on these topics will be your guides. Our Bill Crowley, alas, will not accompany us anymore... I will miss the the amicable mutual teasing that he and I enjoyed. Good-bye my fellow Pentaxian.

The spread of Spring Avens (*Geum vernum*) in Ontario

Michael J. Oldham,
Patrick W. Deacon,
and Will D. Van Hemessen



Spring Avens, *Geum vernum* (Raf.) Torr. & Gray, is a native spring-flowering herb of moist woods in southwestern Ontario which has increased in distribution and abundance in recent years. We compiled and analyzed 239 Ontario records to look at this recent spread.

The first Ontario and Canadian record of Spring Avens was by John Macoun who collected it at Amherstburg, Essex County, in 1882 (specimen at TRT). Macoun collected it again at Amherstburg in 1901 and at Leamington, Essex County, in the same year.

In 1984, *Geum vernum* was mapped by Keddy (1984) in the “Atlas of the Rare Vascular Plants of Ontario” (ARVPO) from seven sites in Essex County, Wheatley in adjacent Chatham-Kent County, and Marburg Station in Haldimand-Norfolk Region (based on a 1957 specimen at TRT). The Marburg Station record was later discounted as being probably based on a mislabeled specimen (Sutherland 1987).

Based on the ARVPO database, Spring Avens had been collected 19 times in Ontario prior to 1980, with 18 of the collections from Essex County and one from Chatham-Kent County (in 1978). In the 1980s and early 1990s Spring Avens was considered a provincially rare plant in Ontario (Argus et al. 1982-1987) and a nationally rare species in Canada (Argus and Pryer 1990).

During fieldwork in Essex County in the 1980s, primarily working on a study of Environmentally Significant Areas (Oldham 1983), Spring Avens was documented 99 times by Oldham and found to be a locally common plant. In 1985 it was first documented in Lambton County and in 1989 the first Middlesex County population was found. Table 1 shows the number of unique records by county in ARVPO (22 records; 1882-1981), the senior author’s (MJO) personal database (180 records; 1981-2015), and iNaturalist (14 records; 2013-2020).

In the 1990s additional locations were found in Essex, Chatham-Kent, Lambton, and Middlesex Counties, though there were no new county records until Spring Avens was found at Point Abino in Niagara Region in 2000. Most recently new county records were added for Huron in 2015, Elgin in 2018, and Haldimand-Norfolk and Peel in 2020 (Table next page). The article title map shows the distribution of Spring Avens in Ontario by decade (two 2020 records are included in the 2010s). Although known from upstate New York adjacent to Ontario (e.g. St. Lawrence County, Eldblom and Johnson 2010), Spring Avens has not yet been found in southeastern Ontario.

Due to the large number of new localities for the species in Ontario, Spring Avens is no longer considered provincially rare (Oldham and Brinker 2009). The species

County	ARVPO	MJO	iNaturalist	First record
Essex	21	151	5	J. Macoun in 1882 (TRT)
Chatham-Kent	1	9	0	Green in 1978 (TRTE)
Lambton	0	19	4	M.J. Oldham & A.A. Reznicek in 1985 (CAN, MICH)
Middlesex	0	2	1	M.J. Oldham in 1989 (MICH, UWO)
Niagara	0	1	0	M.J. Oldham in 2000 (MICH)
Huron	0	1	0	M.J. Oldham in 2015 (DAO, MT, TRT)
Elgin	0	0	3	W.D. Van Hemessen in 2018 (https://inaturalist.ca/observations/12649418)
Haldimand-Norfolk	0	0	1	P.W. Deacon in 2020 (to be deposited at OAC) (https://inaturalist.ca/observations/46549310)
Peel	0	0	0	2020 record by Reuven Martin posted to Facebook Field Botanists of Ontario page with photo

Ontario records of Spring Avens by county (ARVPO=Atlas of the Rare Vascular Plants of Ontario database; MJO=personal records database of M.J. Oldham).

has also “clearly increased in abundance and distribution in recent years” in southern Michigan (Reznicek et al. 2011). Snyder (2000), Greller et al. (2006), Frost and Searcy (2009), and Lamont et al. (2014) documented new Spring Avens populations in New Jersey, New York, and Massachusetts, suggesting the species is spreading elsewhere in northeastern North America.

When flowering or fruiting, Spring Avens can be readily distinguished from other Ontario avens species by its early flowering and fruiting dates, absence of calyx bractlets, very short (1.2 to 2.0 mm) petals and very small (1.0 to 1.2 cm diameter) fruiting heads which are elevated on stalk above the perianth (cover photo). Spring Avens is one of three yellow-flowered *Geum* species in southwestern Ontario (reports of *G. macrophyllum* from southwestern Ontario are likely in error). The other two yellow-flowered avens are the native Yellow Avens (*G. aleppicum*) and the introduced Wood Avens (*G. urbanum*), both of which flower later in the season.

Based on Ontario blooming records of Spring Avens,

dates of flowering in the province range from 18 April to 11 June, with all but three of 60 flowering records being in May. Botham (1981) listed the Essex County blooming period for Spring Avens as being from 12 May to 2 June and not overlapping with that of Yellow Avens (10 June to 24 July). In Ontario, Wood Avens typically flowers in June and July. See Reznicek et al. (2011) for a key to Michigan *Geum* species, which are the same species as occur in Ontario.

Typically found in woodlands, often moist clay woods and floodplains, Spring Avens appears to have an affinity for trails. The species will often line the edges of a trail or centre of a laneway but be completely absent in the adjacent woods. Presumably it is dispersed by human traffic and potentially also by large mammals such as deer.

Particularly during the month of May, Ontario field botanists should be on the look-out for Spring Avens in order to help document its spread in the province.

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Spring Avens leaves and growth habit. Note deeply dissected basal leaves. Photo: P. Deacon, 11 May 2018, Lambton County.

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Biodiversity value of Prince Edward County's Oak-Hickory woodlands

Sheila McKay-Kuja, Paul M. Catling,
Brenda Kostiuk, and Allen Kuja



Prior to settlement, Prince Edward County probably had Sugar Maple (*Acer saccharum*), Beech (*Fagus grandifolia*), Northern Red Oak (*Quercus rubra*) and White Pine (*Pinus strobus*) forest in drier areas and Silver Maple (*Acer saccharinum*) and Ashes (*Fraxinus* spp.) in wetter areas. However, at least 1/5 of the county (approx. 55,000 acres) is on shallow soil over limestone and is classified as Farmington Loam soil (Richards & Morwick 1948). This area was likely an open woodland of



Shagbark Hickory (*Carya ovata*) and Oaks including Bur Oak (*Quercus macrocarpa*), Northern Red Oak, White Oak (*Quercus alba*) and Chinquapin Oak (*Quercus muehlenbergii*, photo above, Mccauley Mtn, 9 Sept. 2020, Photo: P.M. Catling), as well as Red Cedar (*Juniperus virginiana*), and White Ash (*Fraxinus americana*). A larger proportion of this kind of woodland is shown in the county by Whitcombe et al. (1973, Fig. 21, p. 52). Much of the Farmington Loam was cleared for agriculture but was marginal and has now become dense Red Cedar. Remnants of the original Oak-Hickory woodland (see photo) now account for less than 1 % (500 acres) of their former extent. Some of the existing remnants are dominated by the invasive aliens, like European Buckthorn (*Rhamnus cathartica*), Swallowworts (*Vincetoxicum* spp.), and Garlic Mustard (*Alliaria petiolata*). This leads to a loss of ecological integrity including decline of native species due to disruption of key relationships.

The Oak-Hickory woodlands grade into Black Maple (*Acer nigrum*) or Sugar Maple – Red Oak woodlands on deeper soils and into alvar savannah and open alvar on drier sites. They vary from those that are periodically subject to extreme drought (South Shore) to those that are more mesic (Green Point Hill) and they also vary from year to year in extent of drought effects. The drought is an essential feature that maintains open woodland with glades and accounts for rich species composition. In the past, and probably in pre-settlement times, these habitats burned, as indicated by charcoal on remains of large dead trees. Natural fire may also have played a role in preventing change to more closed mesic forest. Thus, fire

suppression, invasives, and cutting together pose a serious threat to survival of remaining Oak-Hickory communities.

Geography

Shagbark Hickory has a largely Carolinian (north shore of Lake Erie) distribution, but like many Carolinian species

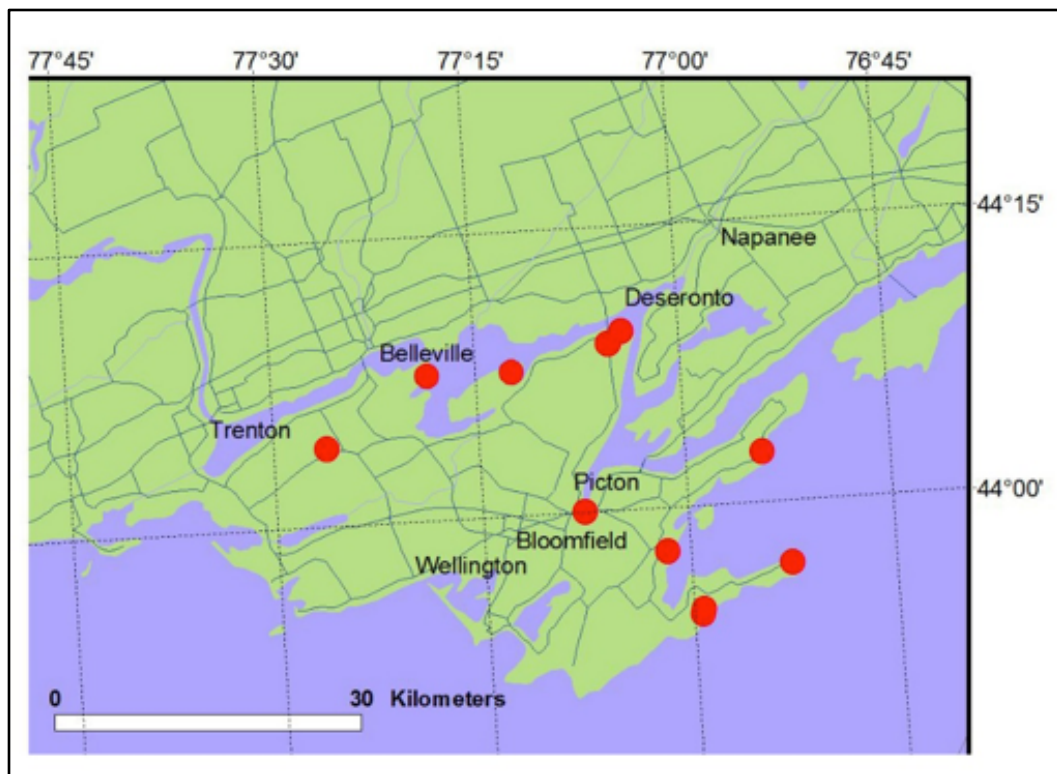
it occurs again at the eastern end of Lake Ontario. This means that Oak-Hickory woodlands are restricted to this part of the province. In the region of Prince Edward there are a few other examples in the Trent Valley (N of Bata, S of Campbellford), and in the Kingston region, but Oak-Hickory woodlands are not widespread and some of the best examples (on map to right) are in The County. A variant of the Oak-Hickory community on Prince Edward's south shore is known from only two occurrences in the province and has been assigned a

conservation rank of S1, "critically imperilled provincially" (Bakowsky 2009). Prince Edward Oak-Hickory sites differ from those in northern New York State (Edinger et al. 2014) in the absence of conifers except for Red Cedar and Common Juniper (*Juniperus communis*). They also appear to differ in their more mesic condition, possibly due to onshore winds rising off eastern Lake Ontario.

Rare Species

The Prince Edward sites contain rare and endangered species. All three of the existing localities in Ontario for the Four-leaved Milkweed (*Asclepias quadrifolia*, see COSEWIC 2010) are in this habitat and all are in Prince Edward. Elsewhere in southern Ontario Oak-Hickory woods, on the north shore of Lake Erie, is the habitat of another of Ontario's most endangered plants, Juniper Sedge (*Carex juniperorum*, see Environment and

Climate Change Canada 2019). Other plants of open woodland and woodland glades are declining in Ontario such as New Jersey Tea (*Ceanothus americanus*). This plant, still existing in some Prince Edward sites, is the larval foodplant for the endangered Mottled Duskywing butterfly.



The list of endangered and regionally rare plant species in the county's Oak-Hickory woodlands includes at least 38 vascular plants. Over 1/4 of the native plants of the county can be found in these high diversity areas. Vascular plants serve as a good indicator of overall biodiversity value. Recently, some very rare flightless grasshoppers were found in one of the Prince Edward sites. Their identity is still under study but they are definitely additions to the known grasshoppers of the county listed by Urquhart in 1941 (and later re-published by Whitcombe et al. 1973). Unusual birds including Eastern Whip-poor-will (threatened in Canada and Ontario) breed in some of the Oak-Hickory areas.

Protection and Management

Studies of the county's Oak-Hickory woodlands currently underway are aimed at a better understanding of their biology and improved protection and

management. Four sites are protected: Macaulay Mtn. near Picton and three sites on the South Shore (Ostrander Point, Hudgin-Rose and Prince Edward Point), with altogether approx. 50 acres. Although this is a good start, it is estimated that variability in stands requires a

2013. Preliminary annotated list of the Vascular plants of Ostrander Point Crown Land Block. Available from the Prince Edward County Field-Naturalists. 39 pp. <http://naturestuff.net/site/images/stories/Organizations/PECFN/>



Wild Blue Phlox (*Phlox divaricata*, left) and habitat with umbrellas of May Apple (*Podophyllum peltatum*, right). Middle Ostrander Point Rd., 12 May 2013.
Photos: P.M. Catling

minimum of at least ten protected remnants and 500 acres to ensure the survival of the various components of this unusual community in the region. Some, if not all, of the protected sites will need management related to controlling both invasive plants and succession to a more closed forest.

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Importance of Prince Edward County Oak-Hickory

1. Rare and/or endangered species – At least 38 plant vascular plant species as an indicator.
2. Restricted habitat – shallow soil over porous limestone with specific moisture regime.
3. High diversity - for plants and other groups using plants as an indicator.
4. Wildflower displays and opportunities for increasingly popular photography.
5. Part of the natural heritage of Prince Edward County at risk - Continuing decline may lead to total loss without protection and management.

The preceding brief article, first published in the FBO Newsletter, is planned for modification as a pamphlet for wider distribution to help profile Oak – Hickory woodlands in Prince Edward County.

Research summary from the 2020 FBO Student Award Winner

Caitlyn Lyons

PhD Student at Wilfrid Laurier University

During my Masters degree at the University of Western Ontario I studied how climate warming alters the plant community in boreal peatlands or more specifically fens. Peatlands are important ecosystems, storing 1/3 of the world's terrestrial carbon but covering only ~3% of the globe. Peatlands have slow rates of decomposition, meaning much of the carbon from plants remains partially decomposed as "peat" making the plant community an important component of the carbon storage ability of peatlands. My field sites were located in Northern Ontario near White, River. I worked in both a poor fen dominated by *Sphagnum* mosses and an intermediate fen dominated by *Carex* sedges. The

Sphagnum-dominated peatland has a ground-covering layer of moss while the *Carex*-dominated peatland is densely populated with sedges. In addition to the mosses and sedges, other plants common in these fens include wild low bush blueberry, Labrador tea, black spruce, leatherleaf, bog rosemary, tamarack, and bog laurel.

In this study we used clear open-top chambers that we placed over top of the vegetation to act as a greenhouse and simulate climate warming. We had 16 plots (1 meter in diameter) at both sites, 8 had clear open-top chambers and 8 were control plots. I monitored the plant

At both sites the warming plant communities became more heterogeneous, meaning not only were the warming plant communities different from control plant communities, but they were also different from each other. At the *Sphagnum*-dominated peatland I found that warming decreased *Sphagnum* moss cover. At the *Carex*-dominated peatland I found an increase in Leaf Area Index under warming, indicating greater plant growth under higher temperatures.

During modest levels of warming and over just two growing seasons I found that the plant community changed at both sites. *Sphagnum* is important to



communities (number of different species and number of individuals of each species) over 2 growing seasons (2017 and 2018) using the point intercept method, where I placed a square grid with 10cm gridlines over top of the plant communities and identified the plant nearest to each intersection, we also noted any non-detects, signifying either bare soil or dead plant. Furthermore, to monitor plant growth I measured Leaf Area Index, where I measured the incoming solar radiation above the plants and below the plants at the soil surface and the difference represents the Leaf Area Index (or how dense the foliage is).

maintain carbon storage in peatlands. Climate warming decreasing *Sphagnum* cover could have implication for the future carbon storage ability of peatlands. Furthermore, previous studies have focused mainly on *Sphagnum*-dominated peatlands and there has been considerably less focus on peatlands dominated by *Carex* sedges. The greater plant growth found in the *Carex*-dominated peatlands indicates greater productivity, increasing decomposition, and again the potential to decrease carbon storage in these important ecosystems. Climate warming can shift peatland plant communities and therefore has implications on ecosystem services such as carbon storage.

This study is part of a large ecosystem level experiment known as BRACE (Biological Response to a Changing Environment) at the University of Western Ontario. This study is in collaboration with the Canadian Forest Service and the Ontario Forest Research Institute. Other

researchers focus on other aspects of climate warming at these two field sites such as gas fluxes, soil invertebrates, water quality, and soil quality.

Remembering Bill Crowley

Troy McMullin

It is with a heavy heart that I remember the late Bill Crowley, long-time FBO board member and friend to many. Bill recruited me to join the FBO and during our shared time on the board he was uniquely encouraging, helpful, and humorous. His commitment, contributions, and lightheartedness will be missed. During his time on the board, Bill served as Vice President (2006-2009), President (2010-2012), Past President (2013 -2015), and Director from 2016 until his passing in July of 2019.

Throughout Bill's life he had many areas of interest. As a student at the University of Manitoba, he focused his studies on chemistry, economics, math, and physics. He then went on to have a 30 year career with Environment Canada as a meteorologist. Bill also had a passion for botany and photography. He made important contributions to many organisations, including terms as President of the Winnipeg Gladiolus Society, President of the North American Gladiolus Council, Chairman of the Winnipeg International Flower Show Board, member of the Parks Canada Species at Risk Committee for the Trent Severn Waterway, and founder of the Northumberland Photography Club in 1996.

Bill was not one to sit idly by in his retirement. He was always an active member of the FBO, going beyond the scope of the positions he held. I also observed him apply the same level of commitment to some of the many other organisations that he was member of: the Art Gallery of Northumberland, Cobourg Seniors Photography Club, Friends of Misery Bay, Owen Sound Field Naturalists, North American Native Plant Society, Northumberland Photography Club, Peterborough Photographic Society, Photo-Nat, Toronto Entomologists' Association, Toronto Digital Photography Club, and the Willow Beach Field Naturalists. I have no doubt that Bill had a large presence in all of these organisations and that his passing is a considerable loss to them as well.

Bill had a kind and gentle soul. I always appreciated his passion for his home garden, where he grew over 40 species of rare wild flowers that are native to Ontario, because, as he put it, "their habitat is being destroyed". Whenever I planned an FBO AGM or led a field trip I was sure to receive a phone call or note from Bill filled with praise. FBO field trips, social events, and meetings will not be the same without him. Bill was a good friend and will be fondly remembered by those who knew him.

