

# THE DIVERSE ORCHIDS IN THE OTTAWA DISTRICT— A COMPARISON

By Joyce M. Reddoch, calopogona@gmail.com

In 2020, Paul Catling and Brenda Kostiuk published a comprehensive treatment of the orchids of Ontario's Bruce Peninsula in this journal (Catling 2020, Catling and Kostiuk 2020a, 2020b). I thought it worthwhile to compare the orchid populations in "the Bruce" with those 400 km to the east in the Ottawa District (Figure 1).

The Ottawa District, as currently defined, is the area within the circle of 50 km radius centred on the Peace Tower of the Parliament Buildings in Ottawa (45.4251° N, 75.7000° W). It is the study area chosen by The Ottawa Field-Naturalists' Club in 1895 as the common focus for the natural history explorations of its members (Reddoch 1995). During the century and a quarter since then, many significant studies on the flora, fauna and geology of the District have been published by Ottawa Field-Naturalists' Club members, writing in their capacities as government scientists or as serious naturalists. Included among these studies is the 1997 monograph on the orchids (Reddoch and Reddoch 1997) and other orchid articles (e.g. Reddoch and Reddoch 2008, Reddoch, Catling and Reddoch 2013).



Figure 1. Southern Ontario showing the locations of the Bruce Peninsula (highlighted left) and the Ottawa District (highlighted right). Map prepared by Paul Catling.

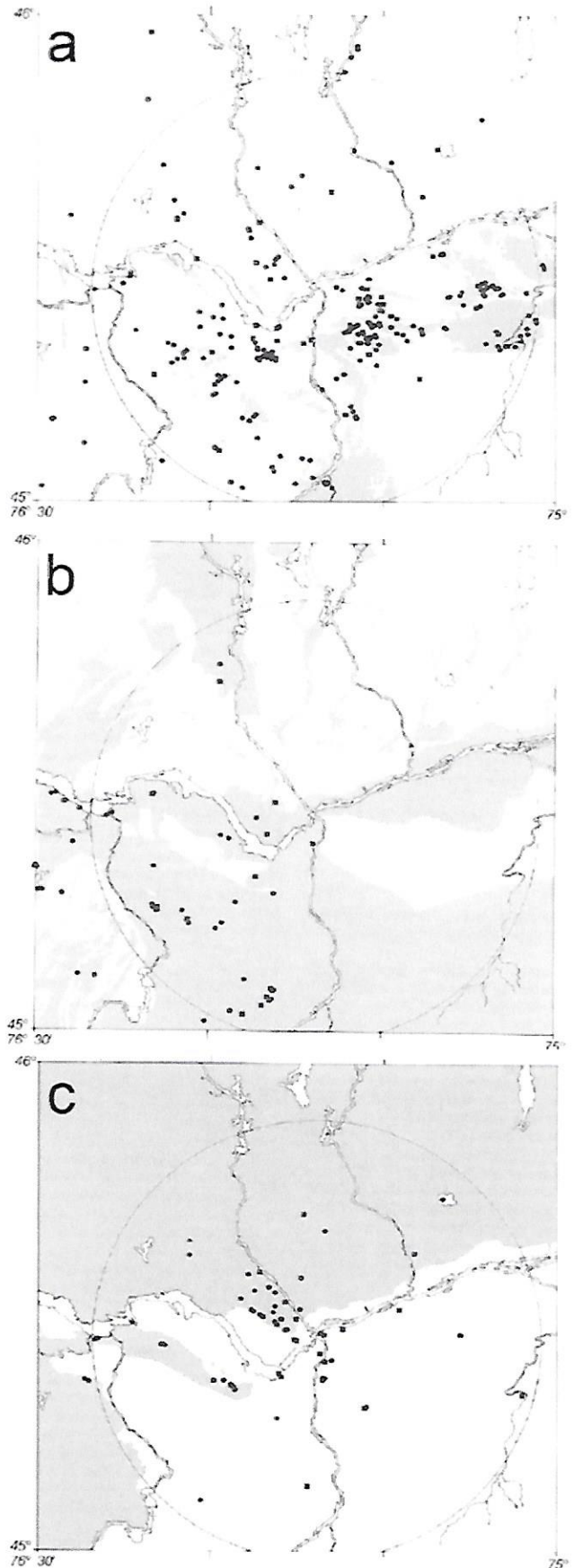


The Ottawa River flows from west to east across the centre of the District, with the Province of Québec to the north and the Province of Ontario to the south (Figures 2 and 3). The uplands of the Canadian Shield dominate the northern half of the District and also outcrop in the Lowlands to the south. Calcareous bedrocks are common — marble on the Shield and limestone in the Lowlands. There are extensive glacial and postglacial deposits including extensive sandy layers overlying parts of the Lowlands and adjacent Shield. This diverse Ottawa District landscape has many habitats that support orchids: mixed, deciduous and coniferous forests; swamps; fens; bogs; alvars and other rock barrens; sand deposits; and shores and floodplains of streams, lakes and rivers. Half of the Ottawa District orchid species occur in wetlands.

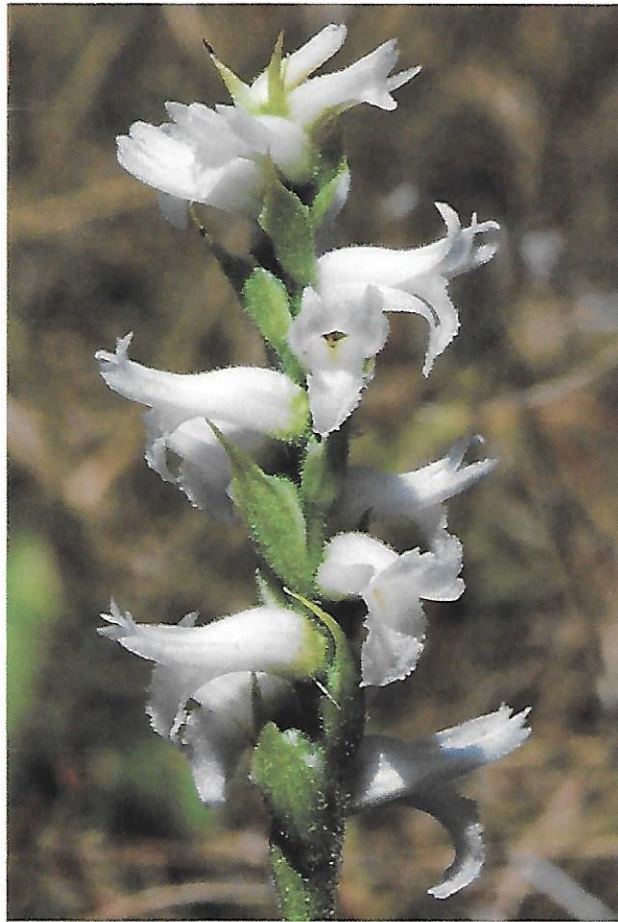


Figure 2. (Above) The Ottawa River and the Lowlands viewed from the 200 m higher Canadian Shield in Gatineau Park, Quebec. Photograph by Joyce M. Reddoch.

Figure 3. (Right) Distributions of three orchids in the Ottawa District showing relationships to surface geology. a. *Spiranthes incurva* (previously *S. cernua*) showing relationship to open, surface sand deposits, which are shaded on the Lowlands; b. *Cypripedium arietinum* showing relationship to calcareous rocks, including marble and limestone, which are shaded; and c. *Galearis spectabilis* showing its relationship with acidic and neutral substrates on the Canadian Shield (shaded) and in the Lowlands. The maps are taken from Reddoch and Reddoch (1997) and contain all records for each species from the beginning of botanical exploration. Photos next page.







a. *Spiranthes incurva*



b. *Cypripedium arietinum*



c. *Galearis spectabilis*

Table: Orchid Species Lists for the Ottawa District and the Bruce Peninsula.

The species treatments and nomenclature, as well as the list of Bruce Peninsula species, are taken from Catling (2020) and Catling and Kostiuk (2020a). Sources for Ottawa District species are Reddoch and Reddoch (1997) and Reddoch, Catling and Reddoch (2013). Calciphile species are marked with an asterisk (\*). A plus sign (+) indicates occurrences less than 100 km from the Ottawa District but not yet known in the District. There have been no records of *Aplectrum hyemale* and *Neottia bifolia* in the District since 1901 and 1902, respectively.

Species /Taxon	Ottawa District		Saugeen Bruce Peninsula
	Ontario	Quebec	
<i>Aplectrum hyemale</i> PUTTYROOT	X	+	X
<i>Arethusa bulbosa</i> DRAGON'S-MOUTH	X	X	X
<i>Calopogon tuberosus</i> TUBEROUS GRASS PINK	X	X	X
<i>Calypso bulbosa</i> var. <i>americana</i> CALYPSO *	X	X	X
<i>Coeloglossum viride</i> FROG ORCHID	X	X	X
<i>Corallorhiza maculata</i> varieties SPOTTED CORALROOT	X	X	X
<i>Corallorhiza odontorhiza</i> AUTUMN CORALROOT	+	+	X
<i>Corallorhiza striata</i> varieties STRIPED CORALROOT *	X	X	X
<i>Corallorhiza trifida</i> EARLY CORALROOT	X	X	X
<i>Cypripedium acaule</i> PINK LADY'S-SLIPPER	X	X	X
<i>Cypripedium arietinum</i> RAM'S-HEAD LADY'S-SLIPPER *	X	X	X
<i>Cypripedium parviflorum</i> varieties NORTHERN YELLOW LADY'S-SLIPPER *	X	X	X
<i>Cypripedium reginae</i> SHOWY LADY'S-SLIPPER *	X	X	X



<i>Epipactis helleborine</i> BROAD-LEAVED HELLEBORINE	X	X	X
<i>Galearis (Amerorchis) rotundifolia</i> SMALL ROUND-LEAVED ORCHID *	X	X	X
<i>Galearis spectabilis</i> SHOWY ORCHIS	X	X	X
<i>Goodyera oblongifolia</i> MENZIES' RATTLESNAKE-PLANTAIN			X
<i>Goodyera pubescens</i> DOWNY RATTLESNAKE-PLANTAIN	X	X	X
<i>Goodyera repens</i> DWARF RATTLESNAKE-PLANTAIN	X	X	X
<i>Goodyera tessellata</i> CHECKERED RATTLESNAKE-PLANTAIN	X	X	X
<i>Liparis loeselii</i> LOESEL'S TWAYBLADE	X	X	X
<i>Malaxis monophyllos var. brachypoda</i> NORTH AMERICAN WHITE ADDER'S-MOUTH *	X	X	X
<i>Malaxis unifolia</i> GREEN ADDER'S-MOUTH	X	X	X
<i>Neottia (Listera) auriculata</i> AURICLED TWAYBLADE		X	
<i>Neottia (Listera) bifolia (L. australis)</i> SOUTHERN TWAYBLADE	X		
<i>Neottia (Listera) convallarioides</i> BROAD-LIP TWAYBLADE	+	+	X
<i>Neottia (Listera) cordata</i> HEART-LEAVED TWAYBLADE	X	X	X
<i>Neottia (Listera) ovata</i> EGG-LEAVED TWAYBLADE			X
<i>Platanthera aquilonis</i> TALL NORTHERN GREEN ORCHID	X	X	X
<i>Platanthera blephariglottis var. blephariglottis</i> WHITE FRINGED ORCHID	X	X	
<i>Platanthera clavellata</i> CLUB-SPUR ORCHID	X	X	X

<i>Platanthera dilatata</i> var. <i>dilatata</i> TALL WHITE BOG ORCHID *	X	X	X
<i>Platanthera flava</i> var. <i>herbiola</i> NORTHERN TUBERCLED ORCHID	X	X	X
<i>Platanthera grandiflora</i> GREATER PURPLE FRINGED ORCHID	X	X	
<i>Platanthera hookeri</i> var. <i>hookeri</i> HOOKER'S ORCHID	X	X	X
<i>Platanthera huronensis</i> LAKE HURON GREEN ORCHID *	X	X	X
<i>Platanthera hyperborea</i> LEAFY NORTHERN GREEN ORCHID	X	X	X
<i>Platanthera lacera</i> RAGGED FRINGED ORCHID	X	X	X
<i>Platanthera leucophaea</i> EASTERN PRAIRIE FRINGED ORCHID *	X		X
<i>Platanthera macrophylla</i> GREATER ROUND-LEAVED ORCHID	+	X	X
<i>Platanthera obtusata</i> subsp. <i>obtusata</i> BLUNT-LEAVED ORCHID	X	X	X
<i>Platanthera orbiculata</i> LESSER ROUND-LEAVED ORCHID	X	X	X
<i>Platanthera psycodes</i> SMALL PURPLE FRINGED ORCHID	X	X	X
<i>Platanthera (Piperia) unalascensis</i> ALASKA REIN ORCHID *			X
<i>Pogonia ophioglossoides</i> ROSE POGONIA	X	X	X
<i>Spiranthes casei</i> var. <i>casei</i> CASE'S LADIES'-TRESSES	X	X	X
<i>Spiranthes incurva</i> (previously <i>S. cernua</i> s. l.) INCURVED LADIES'-TRESSES	X	X	X
<i>Spiranthes lacera</i> var. <i>lacera</i> NORTHERN SLENDER LADIES'-TRESSES	X	X	X
<i>Spiranthes lucida</i> SHINING LADIES'-TRESSES *	X	X	X



<i>Spiranthes magnicamporum</i> GREAT PLAINS LADIES'-TRESSES *	X		X
<i>Spiranthes romanzoffiana</i> HOODED LADIES'-TRESSES	X	X	X
	46 +2 species		47 species

As shown in the Table, 46 species of orchids have been recorded in the Ottawa District. Forty-four species are on the Ontario side of the Ottawa River, and 42 species are on the Québec side. *Aplectrum hyemale*, *Neottia bifolia*, *Platanthera leucophaea* and *Spiranthes magnicamporum* are only on the Ontario side, while *Neottia auriculata* and *Platanthera macrophylla* are only on the Quebec side. All 44 Ontario species have been observed within the City of Ottawa (Reddoch and Reddoch 1997, Brunton 2005), which is only slightly larger than the Bruce Peninsula. Two additional species are known less than 100 km from the Ottawa District, both in Ontario and Quebec, *Neottia convallarioides* and *Corallorhiza odontorhiza* (Whiting and Catling 1986, Sabourin 1993, Oldham and Consiglio 2018, iNaturalist 2021).

The 47 Bruce Peninsula orchid species are included in the Table for comparison. *Neottia auriculata*, *Neottia bifolia*, *Platanthera blephariglottis* and *Platanthera grandiflora* (Figure 4) are known in the Ottawa District but not in the Bruce, while *Corallorhiza odontorhiza*, *Goodyera oblongifolia*, *Neottia convallarioides* and the non-native *Neottia ovata* have not been recorded within the Ottawa District. As noted above, the first and third species are known from locations close to the District.

Why do the Ottawa District and the Bruce Peninsula have as many orchid species as they do?

Both the Ottawa District and the Bruce Peninsula are at 45° latitude, halfway between the Equator and the North Pole (Figure 1). They are in the Great Lakes - St. Lawrence Forest Region, a region of predominantly deciduous and mixed forests (Rowe 1972, Ressources naturelles Québec 2003, Wester et al. 2018). There are many reasons why the two locations have rich floras, including orchids. Some of these reasons are climate, substrate, and disturbance (Catling and Kostiuk 2020a). As well, location relative to species distributions, and the length of time that the areas have been explored botanically are important factors.

As Catling and Kostiuk (2020a) have shown, the climates of the Ottawa District and the Bruce Peninsula are similar but not identical. These differences are enough to influence the relative occurrences, abundances and distributions of some species in these two areas.

As described above, the Ottawa District has a complex geological history that provides diverse substrates that are the basis for many orchid habitats (Figure 3). Since the withdrawal of the most recent ice sheet about 11,500 years ago, continual changes in climate and the physical landscape have been the norm. Disturbances in the



form of floods, earthquakes, landslides, wind storms, tornados and fires are some of the natural events that have altered the landscape for thousands of years. European settlement, beginning in the early 1800s, has also resulted in major and far-reaching changes to the natural landscape. Forest clearing for agriculture and lumbering was followed by widespread fires on both sides of the Ottawa River. The most recent major fire north of the river occurred in 1923. South of the river, a massive fire in 1870 extended from Arnprior, at the western edge of the District, to within a mile of the settlement of Ottawa. The inferno was finally halted when water was released from a dam to fill a wide ravine in front of the fire's path. And, the next year, "once more the land laughed, its harvests and fields were green in the bounty of Nature" (Walker 1968).

The location of a place in relation to the distribution of the species as a whole is, of course, important. Both the Ottawa District and the Bruce Peninsula are well within the distributions of the species that occur there, most of which have Great Lakes - St. Lawrence - eastern North American distributions (Whiting and Catling 1986, Romero-Gonzalez et al. 2002). Both areas are near the southern borders of a few northern, transcontinental species, such as *Calypso bulbosa* and *Galearis rotundifolia*. Additionally, some predominantly western species, such as *Goodyera oblongifolia*, *Platanthera unalascensis*, and the midwestern *Spiranthes magnicamporum*, have disjunct occurrences to the east of their main distributions, perhaps the results of seeds being carried by the prevailing westerly winds in the near or distant past. Thus all three species mentioned are found in the Bruce, but only *Spiranthes magnicamporum* is known in the Ottawa District farther east, where Paul Catling discovered it recently (Reddoch, Catling and Reddoch 2013). The distribution of *Platanthera grandiflora* (Figure 4) includes the lower Ottawa Valley in its eastern distribution, but does not extend westward to the Bruce Peninsula (Sheviak 2002, iNaturalist 2021). The Eurasian orchid, *Neottia ovata*, just happens to have colonized a few places in southern Ontario including the Bruce Peninsula, likely brought there in the twentieth century by human means.

The Ottawa District has been explored botanically for at least 200 years. The earliest known collection is of a Harebell (*Campanula rotundifolia*) gathered by the Scottish botanist Christian Ramsay, Countess of Dalhousie, in 1827 at the "Grand Falls of the Chaudière of the Ottawa [River]" at Bytown (now Ottawa) (Pringle 1995). In the 1860s and 1870s four Ottawa orchids, *Calypso bulbosa*, *Cypripedium parviflorum*, *Galearis spectabilis* and *Goodyera repens*, were among the 68 plants that were the subjects of technically excellent watercolour paintings by Elizabeth Keen White (Dore 1965). Most of the plants had been collected by Elizabeth's husband, Lieutenant-Colonel William White, who became the first President of The Ottawa Field-Naturalists' Club in 1879. The earliest herbarium collections of orchid specimens date from 1860 (Queen's University at Kingston, and Agriculture and Agri-Foods Canada herbaria (QK and DAO)). In the 1960s, interested Ottawa Field-Naturalists' Club members began to focus specifically on orchids. Ed Greenwood organized the Native Orchid Location Survey to locate and map accurately the orchid colonies in the Ottawa District (Greenwood 1967, Reddoch and Reddoch 1997). During the decade of its most intense work, the Survey's orchid specialists made over 3500 site records. Needless to say, we did not collect plants at each site for herbarium records.



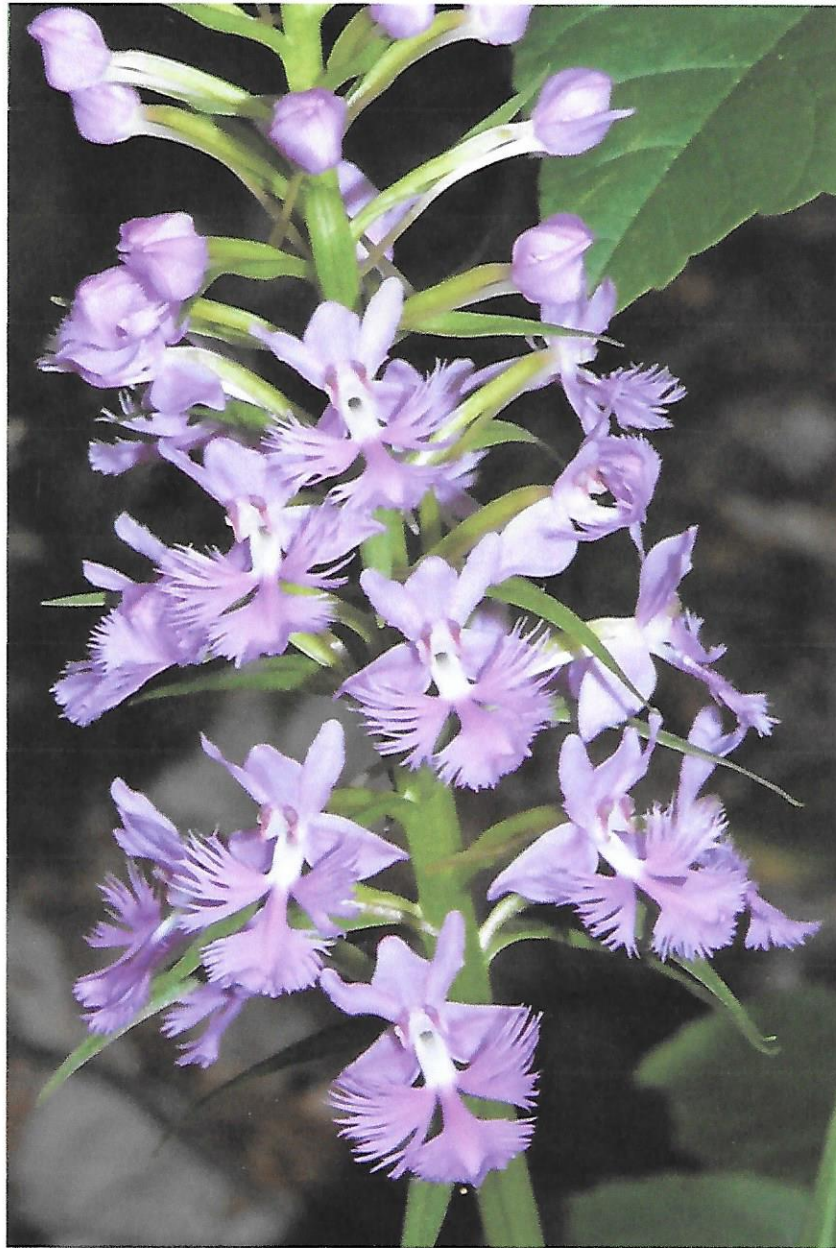


Figure 4. *Platanthera grandiflora* is an eastern orchid present in Ontario only in the lower Ottawa Valley. In the District it is scattered across the Canadian Shield on acidic and neutral substrates, and in the Lowlands on deep sands. Photograph by Joyce M. Reddoch.

Here is an example of change — the impact of human disturbance, and subsequent succession — during my lifetime. The work of the Native Orchid Location Survey in the 1960s and 1970s coincided with the building of new roads and highways, which resulted in expanses of moist sand being exposed in borrow pits and along roadsides. Several orchids, especially *Platanthera lacera* and *Spiranthes incurva* (Figure 3a), which had previously been very rare in the District, became very common in these newly-created habitats, especially in the Lowlands. In the past 40 years, though, the borrow pits have become forests, and the roadsides have become overgrown. Consequently, both of these species are now uncommon in the District once more.



In summary, then, both the Ottawa District and the Bruce Peninsula are rich in orchid species, and in fact have the same number of native species. This diversity is the result of geology, location, and natural and human disturbances, among many other factors, including climate change. Catling and Kostiuk (2020b) suggest three possible orchids that might move into the Bruce Peninsula: Purple Twayblade (*Liparis liliifolia*), Small White Lady's-slipper (*Cypripedium candidum*), and Northern Oval Ladies'-tresses (*Spiranthes ovalis* var. *erostellata*). These three species are also currently known close to the Ottawa District. (See Figure 5 for background and current status of *Liparis liliifolia* near Montreal.) It might well be that one (or more) of these “close to” species already grows in the District. It's just that no one has discovered it yet.



Figure 5. (Right) *Liparis liliifolia* is one of the orchids that occurs close to the Ottawa District. It was first discovered in Quebec in 1999 by Bob Barnhurst and Mabel McIntosh at the Morgan Arboretum west of Montreal. They found about a dozen plants in a mostly deciduous swamp. About six years later, Ann Godbout of the Arboretum staff discovered a second group of about 600 plants in similar habitat ½ km farther west. The population was stable through at least 2010 and 2011, but a decade later it is apparent that numbers have declined substantially (Bob Barnhurst, pers. comm. 2021; photographs by Bob Barnhurst).

### Acknowledgements

Many thanks to Bob Barnhurst for sharing his knowledge and photographs of the Montreal population of *Liparis liliifolia*, and to Paul Catling and Brenda Kostiuk for their useful suggestions and technical support.



## References

- Brunton, D.F. 2005. Vascular Plants of the City of Ottawa, with the Identification of Significant Species. Appendix A of Urban Natural Areas Environmental Evaluation Study. Final Report. Planning and Growth Management Department, City of Ottawa, Ontario.  
[https://app06.ottawa.ca/calendar/ottawa/citycouncil/ec/2005/05-24/AppendixA%20-%20OTTAWA%20FLORA%20\(APR%2005\).htm](https://app06.ottawa.ca/calendar/ottawa/citycouncil/ec/2005/05-24/AppendixA%20-%20OTTAWA%20FLORA%20(APR%2005).htm)
- Catling, P. 2020. Orchids of the Bruce Peninsula. Part I. Introduction, history of study and a current checklist. Native Orchid Conference Journal 17(1): 4—15. [NOC JOURNAL V17.1 \(filesusr.com\)](#)
- Catling, P., and B. Kostiuk. 2020a. Orchids of the Bruce Peninsula. Part II. Why are there so many orchids on the Bruce? Native Orchid Conference Journal 17(1): 16—31. [NOC JOURNAL V17.1 \(filesusr.com\)](#)
- Catling, P., and B. Kostiuk. 2020b. Orchids of the Bruce Peninsula. Part III. Is the Bruce orchid flora changing? Native Orchid Conference Journal 17(1): 32—41. [NOC JOURNAL V17.1 \(filesusr.com\)](#)
- Dore, W.G. 1965. Wild Flowers of Canada Sketched from Nature by Elizabeth Keen White. Photographs of the paintings and a typescript listing the annotations, sometimes accompanied by notes by the author. Unpublished file deposited at the Agriculture and Agri-Foods Canada herbarium (DAO), Ottawa, but apparently now lost. (In 1965 the original album containing the 68 watercolour paintings was held in the City Library and Museum, London, Ontario, but it also appears now to be lost.)
- Greenwood, E.W. 1967. Orchid Location Survey. *Trail & Landscape* 1(1): 26—27.  
<https://www.biodiversitylibrary.org/item/265857#page/27/mode/1up>
- iNaturalist 2021. California Academy of Sciences and the National Geographic Society. <https://www.inaturalist.org>
- Oldham, M.J., and J. Consiglio. 2018. Autumn Coralroot (*Corallorhiza odorhiza*), an update on its distribution in Ontario. *Field Botanists of Ontario Newsletter* 30(2): 4—7. [https://www.researchgate.net/publication/326710998\\_Autumn\\_Coralroot\\_Corallorhiza\\_odontorhiza](https://www.researchgate.net/publication/326710998_Autumn_Coralroot_Corallorhiza_odontorhiza)
- Pringle, J.S. 1995. Canadian botanical specimens collected 1826—1828 by the Countess of Dalhousie, acquired by the Royal Botanical Gardens. *Canadian Horticultural History* 3(1): 1—21.
- Reddoch, J.M. 1995. The Ottawa District --- a hundred years of knowledge gained. *Trail & Landscape* 29(4): 135—137.
- Reddoch, J.M., and A.H. Reddoch. 1997. The Orchids in the Ottawa District: Floristics, Phytogeography, Population Studies and Historical Review. *Canadian Field-Naturalist* 111 (1): 1—185. <https://www.biodiversitylibrary.org/item/100892#page/1/mode/1up>
- Reddoch, J.M., and A.H. Reddoch. 2008. A Window on Orchid Population Longevity in the Ottawa District (Canada). *Native Orchid Conference Journal* 5(1): 1—5 and 9—13.
- Reddoch, J. M., P. M. Catling and A. H. Reddoch. 2013. Great Plains Ladies'-tresses, *Spiranthes magnicamporum*: Disjunct in Eastern Ontario and a new orchid species for the Ottawa District and Lanark County. *Canadian Field-Naturalist* 127 (4): 348—351.  
[https://www.researchgate.net/publication/289726877\\_Great\\_Plains\\_Ladies'-tresses\\_Spiranthes\\_magnicamporum](https://www.researchgate.net/publication/289726877_Great_Plains_Ladies'-tresses_Spiranthes_magnicamporum)
- Ressources naturelles Québec. 2003. Vegetation Zones and Bioclimatic Domains in Québec.  
<https://mern.gouv.qc.ca/english/publications/forest/publications/zone-a.pdf>
- Romero-Gonzalez, G.A., G.C. Fernandez-Concha, R.L. Dressler, L.K. Magrath and G.W. Argus. 2002. 230. Orchidaceae Jussieu. In: *Flora of North America North of Mexico*. New York and Oxford. Vol 26, pages 490+.
- Rowe, J.S. 1972. *Forest Regions of Canada*. Canadian Forestry Service Publication No. 1300. 172 pages + map.
- Sabourin, A. 1993. Les orchidées du Québec. *Quatre-temps*. 17(1): 25 and 31—32.
- Sheviak, C.J. 2002. *Platanthera grandiflora*. In: *Flora of North America North of Mexico*. New York and Oxford. Vol. 26, page 565.
- Walker, H., and O. Walker. 1968. *Carleton Saga*. Carleton County Council. 571 pages.
- Wester, M.C., B.L. Henson, W.J. Crins, P.W.C. Uhlig, and P.A. Gray. 2018. *The Ecosystems of Ontario, Part 2: Ecodistricts*. Science and Research Technical Report TR-26. Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. 474 pages + appendices.  
<https://files.ontario.ca/ecosystems-ontario-part2-03262019.pdf>
- Whiting, R.E., and P.M. Catling. 1986. *Orchids of Ontario*. CanaColl Foundation, Ottawa, Ontario. 169 pages.





[nativeorchidconference.org](http://nativeorchidconference.org)

NOC Facebook Group: [www.facebook.com/groups/460264675690/](https://www.facebook.com/groups/460264675690/)

NOC Facebook Page: <https://www.facebook.com/The-Native-Orchid-Conference-Inc-292969950721047>

ISSN 1554-1169







## The Native Orchid Conference, Inc.

P. O. Box 2047 Boone, NC 28607-2047

### Websites

[www.nativeorchidconference.org](http://www.nativeorchidconference.org)  
[www.facebook.com/groups](https://www.facebook.com/groups)  
[www.facebook.com/page](https://www.facebook.com/page)

### Officers

President: Robert Sprague  
bobsatcyndal@aol.com

Vice-President: Rick Burian  
bur.rick@att.net

Secretary: Janice Yates  
jyates11@earthlink.net

Treasurer: Richard Barmore  
rebster61@yahoo.com

### Board Members at Large

Cathy Bloome /catbloome@sbcglobal.net

David McAdoo /ncorchid@yahoo.com

Judy McCrary /jmccray2190@gmail.com

Mark Rose /rmarkrose\_2000@yahoo.com

Ben Rostron, Ph.D. /ben.rostron@ualberta.ca

Dave Taft /orchiddave99@gmail.com

### Case Grant Committee Chair

Doug Martin, Ph.D. /dofrma44@gmail.com

### Publicity Chair

Linnea Hanson /linneahanson@gmail.com

### IT/Communication Chair

Kyle Langford /klangfor@verizon.net

### Webmaster

Amy Levengood /all70@dejazzd.com

### Technical Advisor

Paul Catling, Ph.D. /brenda.kostiuk@gmail.com

### Editor

Chelsea Kieffer /chelseakieffer@gmail.com

2021

# THE NATIVE ORCHID CONFERENCE JOURNAL

VOLUME 18, ISSUE 3 : TABLE OF CONTENTS

FRONT COVER	<i>Platanthera elegans</i> subsp. <i>elegans</i> Photo: Bill Kress
3-13	The Diverse Orchids in the Ottawa District— A Comparison By Joyce M. Reddoch
14-21	Mini Field Trip to Lanphere Nature Preserve, Humboldt County, CA. By Bill Kress
22-56	A Systematic Survey of the <i>Spiranthes cernua</i> species Complex (Orchidaceae) in New York By Michael Hough and Matthew A. Young
57	2021 Case Fund Grant Recipients
BACK COVER	<i>Spiranthes incurva</i> Photo: Joyce M. Reddoch