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A Window on Orchid Population Longevity in the Ottawa District (Canada)

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In 1895, The Ottawa Field-Naturalists' Club established a common study area for all fields of natural history. This area, the Ottawa District, is a 50-km-radius circle centered on the Parliament Buildings in Ottawa, Ontario. The northern half of the District is in Quebec and the southern half is in Ontario. Since 1895, professionals and amateurs alike have published numerous studies on a variety of subjects "in the Ottawa District," including birds, amphibians and reptiles, butterflies, grasses, and lichens.

Within this tradition, Edward W. Greenwood founded the Native Orchid Location Survey in 1966 to search out and record orchid populations in order to provide a database for future scientific studies and conservation planning. In 30 years, members of the Survey, including us, recorded some 3500 sight records for 41 of the 43 known species. Two new species for the District were discovered, *Listera auriculata* and *Platanthera leucophaea*, while two species documented by herbarium collections, *Aplectrum hyemale* and *Listera australis*, could not be found.

Between 1966 and 1996 we monitored independently a number of orchid populations in order to collect data and life-history information for our monograph on the orchids in the Ottawa District (Reddoch and Reddoch 1997). Subsequently we continued to make detailed annual investigations of some populations (Reddoch and Reddoch, 2005, 2007a, 2007b), and monitored others less intensively to record only the numbers of plants/flowering stems present. In addition, we have followed five orchid populations outside the Ottawa District on an "are they still there?" basis. We visited all of the sites with the welfare of the habitats and plants uppermost in mind.

Population lifetimes of North American orchids generally are not well known (Light and MacConaill, 2005). Under suitable conditions, we find that many orchid populations can persist for considerable lengths of time and, indeed, we realize that even the longest of our documented records may cover only a fraction of their lifetimes. Some populations are long-lived because the plants are long-lived, e.g. *Goodyera pubescens* and *Platanthera hookeri*, while others are long-lived although individual plants are short-lived, e.g. *Spiranthes cernua* and *S. lacera*. Other populations are short-lived with short-lived plants, e.g. *Coeloglossum viride* and *Platanthera lacera*. In the long term, though, habitats are not permanent but change as a result of succession, natural events

(droughts, beaver flooding) and human intervention. Orchid populations can survive only as long as there are suitable habitats available for them.

Below we list our longest-observed populations for each of 35 species in the Ottawa District and a few adjacent areas in Ontario (noted by county). More than half of the records are for periods of 35 or more years. Each population generally was less than 100 m in extent. The species are arranged by the habitat in which we observed them. The total lengths of the records were calculated from the earliest available evidence, which sometimes included herbarium collections or the reliable sight records of others. This information is an update of our contributions to the list of North American long-term studies surveyed by Light and MacConaill (2005).

In addition to the Ottawa District records listed below, Marilyn Light and Michael MacConaill have been studying both a *Cypripedium parviflorum* var. *pubescens* population and an *Epipactis helleborine* population since 1985 (Light and MacConaill, 2005, 2006, pers. com.). In 1992, André Sabourin (pers. com.) visited a Quebec fen/swamp complex and confirmed the (presumably) continued existence of three *Cypripedium* species that grew there at the turn of the 20th century: *Cypripedium arietinum* noted in 1912, *C. parviflorum* in 1900 (F. Fyles, 1912) and *C. reginae* in 1893 (Whyte, Craig, and Cowley, 1893).

Figures: Please see pages 9-13.

Table 1: Longest-observed Orchid Populations in the Ottawa District and Surrounding Areas.

*herbarium specimen at the Vascular Plant Herbarium, Agriculture Canada, Ottawa (DAO)

[1] year after which we no longer found any plants although we continued to visit the site for several more years

[2] We have not visited this population since 1996 out of respect for the fragility of the habitat. We have, however, heard various reports from as late as 2005 that the population is “still there”. Thus this population has been known for 47 years.

[3] current access blocked by beaver flooding; colony probably still present

[4] site bulldozed to contain a fire, 1999

AH = the late Anne Hanes, personal communication

EWG = the late Edward W. Greenwood, personal communications and his records in the Native Orchid Location Survey

JP = the late Joe Purdon, property owner, personal communication

Species	Records (# of years)	Records by other observers	Our recording period
Fens and Swamps			
Amerorchis rotundifolia	36	1966 (EWG)	1981-2001[1]
Amerorchis rotundifolia (Frontenac Co.)	38	1959 (Devitt 1961)	1969-1996[2]
Arethusa bulbosa	41		1967-2007
Calopogon tuberosus	42	1966 (EWG)	1967-2007
Calypso bulbosa (Frontenac Co.)	7		1973-1979
Cypripedium parviflorum var. *pubescens*	43	1965 (EWG)	1968-2007
Cypripedium reginae (Lanark Co.)	ca. 73	ca. 1935-1981 (JP)	1981-2007
Liparis loeselii	39		1969-2007
Listera cordata	30	1967 (EWG)	1974-1996
Platanthera blephariglottis	25		1970-1994
P. clavellata	40		1968-2007
P. dilatata	42	1966 (EWG)	1967-2007
P. huronensis	40		1968-2007
P. leucophaea (Leeds Co.)	52	1956*	1970-2007
P. orbiculata	40	1966 (EWG)	1977-2005[1]
Pogonia ophioglossoides	130	1878* (Reddoch and Reddoch, 2005)	1967-2007
Spiranthes romanzoffiana (Lanark Co.)	34	1967 (EWG)	2000

Species	Records (# of years)	Records by other observers	Our recording period
Forests, including Stream Flood Plains therein			
Coeloglossum viride	7		1973-1979[1]
Corallorhiza maculata	33	1965 (AH)	1975-1997[1]
C. striata	32		1968-1999[1]
C. trifida	33		1968-2000[1]
Galearis spectabilis	39	1969*	1973-2007
Goodyera pubescens	40	1968* (Reddoch and Reddoch, 2007b)	1975-2007
G. tesselata	29		1975-2003[1]
Listera auriculata	11	1967 (Greenwood, 1968; MacKenzie and Greenwood, 1969)	1967-1977[1]
Platanthera aquilonis	15		1993-2007
P. grandiflora	39		1969-2007
P. hookeri	29	(Reddoch and Reddoch, 2007a)	1978-2006[1]
P. psycodes	39		1969-2007
Pine Plantations			
Cypripedium acaule	40	1968 (EWG)	1969-2007
Spiranthes lacera	39		1969-2007

Species	Records (# of years)	Records by other observers	Our recording period
Alvars, Sandstone Barrens and Old Fields			
Cypripedium arietinum	29		1968-1996[4]
C. parviflorum var. *pubescens*	29		1968-1996[4]
Malaxis unifolia	31		1977-2007
Platanthera lacera	18		1981-1998[1]
Spiranthes casei	36	1972*	1977-2007
S. cernua	35		1973-2007

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New and Significant Chromosome Numbers in *Spiranthes*

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Cytology can provide a fundamental framework within which relationships may be elucidated. It provides certain absolutes against which other lines of evidence must be interpreted. In extreme cases, cytogenetic data may directly explain the variation of complex populations. Our understanding of *Spiranthes*, and the taxonomic interpretation of the genus, has benefited greatly from this line of investigation, with the status, origins, variation, and evolution of various species clearly demonstrated by cytogenetics.

The known cytology of the genus has been presented elsewhere and need not be repeated here. One feature is of particular interest to the present paper, however. These previous studies have shown species of *Spiranthes* to comprise two distinct lineages, a larger one with chromosome numbers based on n=15, and a smaller group with n=22 (Sheviak, 1982, 1984, 1989, 1990). These groups tend to be morphologically distinctive. In particular, the venation of the lip differs. Whereas the species in the 15-based series generally exhibit several veins with parallel branches, those in the 22-based series tend to have fewer veins, the lateral with abruptly and widely diverging branches. In addition, many species in this lineage have sepals that are connate at the base, forming a short calyx tube. The extreme development in the group is seen in *S. romanzoffiana* Cham. with its basally fused sepals and lip with three veins, the lateral with a few branches that diverge at nearly right angles.

In the course of various studies, chromosome numbers were obtained for five species for which numbers have not been reported. The results are presented here, in some cases with further discussion.

Methods

Ovarian tissue was prepared according to the method outlined in Sheviak (1982). This technique yields mitotic divisions from developing ovules. Often meiotic figures are also seen. Sampling was conducted around midday due to periodicity in mitosis. First meiotic divisions with their pairing characteristics are typically also found at this time. In some of the species studied here, however, Metaphase II divisions are sometimes seen as well.

Discussion

Spiranthes torta: I obtained this count many years ago, but never reported it because of the awkwardness of reporting what is clearly an aberrant aneuploid number. Presumably the species is normally 2n=30, but this is not absolutely certain; a count of 2n=32 cannot be ruled out, but there is no precedent for

SPECIES/COLLECTION	MITOTIC	MEIOTIC
Spiranthes brevilabris Lindl.		
Florida: Levy Co. *Brown s.n.* [NYS]	$2n$=30	
(2nd plant, in cultivation, as *Sheviak 6246* [NYS]	$2n$=30	15_{II}
Spiranthes floridana (Wherry) Cory		
Florida: Bradford Co. *Brown s.n.* [NYS]	$2n$=30	n=15
Spiranthes torta (Thunb.) Garay & H.R. Sweet in R.A. Howard		
Florida: Monroe Co. *Catling s.n.* [DAO]	$2n$=31	15_{II} 1_{I}
Spiranthes praecox (Walter) S. Watson in A. Gray		
North Carolina: Brunswick Co. *Sheviak 6492* [NYS]	$2n$=44	22_{II}
Spiranthes tuberosa Raf.		
South Carolina: Aiken Co. (2 populations)		
1st population, *Sheviak 7071a* [NYS]*	$2n$=24	12_{II}
2nd population, *Sheviak 7071c* [NYS]*	$2n$=24	12_{II}
*Plants of *Dueck s.n.* [NYS] sent in dormant condition and cultivated for processing at a later date.		

such a number in the genus.

Spiranthes praecox: Members of the n=22 series are primarily cordilleran in distribution, most species being limited to the western United States and Central America. Only the widespread boreal and montane *S. romanzoffiana* and the primarily northeastern *S. lucida* (H.H. Eaton) Ames have been known members of the group with an eastern distribution. To this short list can be

added the southeastern *S. praecox*, a membership that I have long suspected on morphological grounds. The branching veins of the lip, clearly outlined with green, display the classic pattern characteristic of the group.

Spiranthes tuberosa: The remarkable and evidently unique number for this species (Figure 1; facing page) is highly significant. Lucy Dueck asked if I was aware of a number for the species, as it was significant to her study. I offered to obtain one for her if she could send me material. Two plants from different populations were counted and yielded the same results. Apart from a unique number, the species is particularly significant because it suggests the origin of the n=22 series. *Spiranthes tuberosa*, with n=12, is evidently a member of an aneuploid reduction series. Apparently a series of species developed through sequential loss of chromosomes, eventually yielding the number present in *S. tuberosa*. Loss of one additional chromosome would yield a plant with n=11; doubling that would give the progenitor of the n=22 series. In nature, successful tetraploids are nearly always allotetraploids, i.e., the result of hybridization. Perhaps, then, the aneuploid series was at one time more diverse than this one count implies, with at least two species with n=11. With additional sampling, other members of the series might be found to be extant, although not many species remain with unknown cytology. Note also that this series suggests that the base number of the 22 lineage is x=11, not 22.

The tiny lip of this species provides little room for the elaboration of veins, but in fact, the three nerves and branching of the laterals at right angles provides a clear link to the n=22 series. Indeed, the short, stout tuberous root suggests those commonly seen in *S. romanzoffiana*.

Acknowledgements
I wish to thank P.M. Catling, P.M. Brown, and L. Dueck for providing the fresh material or live plants necessary for the cytological preparations.

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Figure to accompany 'New and Significant Chromosome Numbers in *Spiranthes*' by Charles J. Sheviak (Page 6). **1** - *Spiranthes tuberosa* (*Dueck s.n.*, as *Sheviak 7071a*): Megaspore mother cell, first meiotic metaphase showing 12 bivalents. Image: Charles Sheviak.

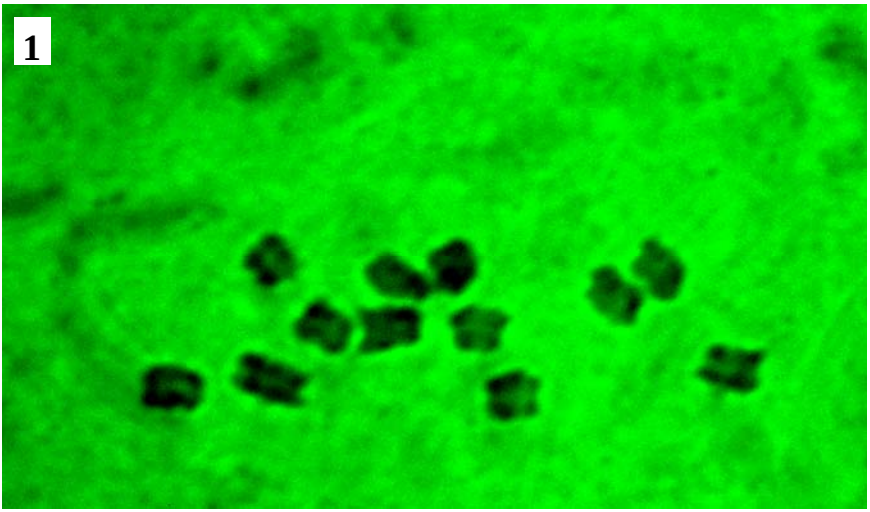


Figure to accompany 'A Window on Orchid Population Longevity in the Ottawa District (Canada)' by J.M. Reddoch and A.H. Reddoch (page 1). **1a** - This Quebec fen provides habitats for long-lived populations of *Amerorchis rotundifolia*, *Arethusa bulbosa*, *Calopogon tuberosus*, *Cypripedium reginae*, *Platanthera clavellata*, *P. dilatata*, *P. huronensis* and *Pogonia ophioglossoides*. Image: J.M. Reddoch.

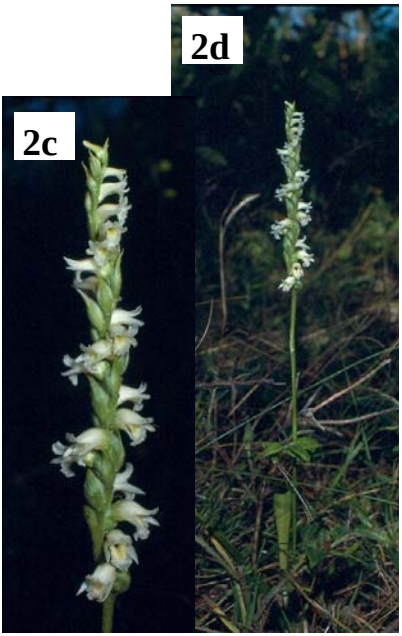
Figures to accompany 'A Window on Orchid Population Longevity in the Ottawa District (Canada)' by J.M. Reddoch and A.H. Reddoch (page 1). Images: J.M. Reddoch.

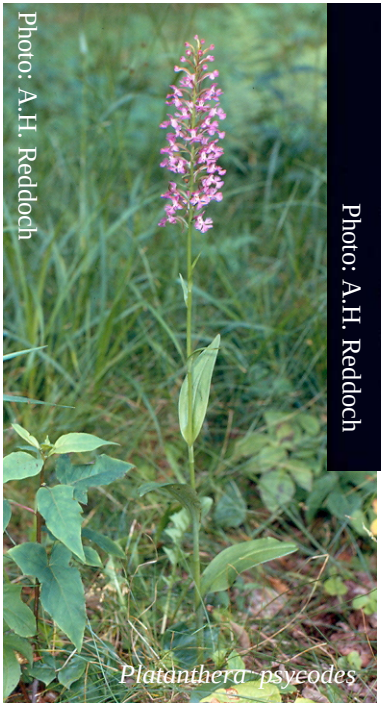
1b and 1c - *Amerorchis rotundifolia*

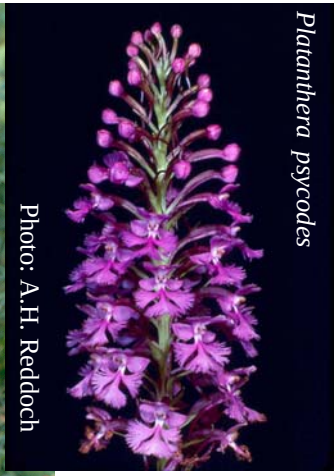
1d - *Platanthera dilatata*

Figures to accompany 'A Window on Orchid Population Longevity in the Ottawa District (Canada)' by J.M. Reddoch and A.H. Reddoch (page 1). Images: J.M. Reddoch.

2a - Five orchid species occur in this sandstone barrens: *Spiranthes cernua* and *Liparis loeselii* around the seasonal pool in the foreground, and *Malaxis unifolia*, *Spiranthes lacera* and *S. casei* on the drier but shallower soils in the background; **2b -** *Liparis loeselii*; **2c and 2d -** *Spiranthes casei*.







Figures to accompany 'A Window on Orchid Population Longevity in the Ottawa District (Canada)' by J.M. Reddoch and A.H. Reddoch (page 1). See this page and the facing page.


Platanthera hookeri
Photo: A.H. Reddoch


Platanthera hookeri
Photo: A.H. Reddoch


Platanthera hookeri
Photo: J.M. Reddoch


1


2


3

Photos to accompany 'In Search of a Lost Treasure' by Kelvin Taylor (page 17). Images: Kelvin Taylor

1. Dial Creek (facing page)
2. Thicket (facing page)
3. *Platanthera peramoena* in the thicket (facing page)
4. *Platanthera peramoena*
5. close-up image of *Platanthera peramoena*

Photos to accompany ‘Winter Orchid Huntin’’ by Tom Sampliner (page 19). Images: Tom Sampliner.

In Search of a Lost Treasure

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Searching for lost treasure is not just something you read about in books. It can be quite a real adventure. Of course knowing what to look for, along with a good map, greatly enhances the chance of success. This is a story about special treasure lurking deep in the woods of rural Durham County, NC.

One morning in mid-July of 2007 I decided to go hunting for this hidden treasure. I took with me a topo map, a field report from the North Carolina Natural Heritage Program, camera gear, food, and water. The treasure I was seeking wasn't a chest full of gold or silver. In fact it was worth more than money. Something rare and pulchritudinous found only a few places in the State. It was a botanical gem not seen in this region in over a decade.

Today's trip took me to Dial Creek, which is located within the Hill Demonstration Forest in northern Durham County. I arrived at my destination at around 9 a.m. After parking along the shoulder of a desolate country road near a small culvert, I walked a short distance to reach Dial Creek (Figure 1; page 14). My directions told me to head upstream, but penetrating that thick tangle of woody shrubs and briars flanking the creek was only the first challenge I would encounter. Next would be locating the seepage area where the treasure was hiding. I cut through a tangle of thorny *Smilax*, and I made my way into the dense thicket.

Once in the woods I noticed straight ahead an open area with ample sunlight beaming down to the forest floor (Figure 2; page 14). I continued in that direction until I reached the large seepage area described in the field report. Even though it was more open, it still proved to be a hazardous trek. Dozens of fallen trees from past storms littered the ground. This along with the mucky soil made each step quite taxing.

An hour passed with no sign of the treasure. I said to myself this is similar to looking for a needle in a haystack. The cliché was befitting. Perhaps it was no longer here. Maybe the change in the forest canopy allowing competition from *Lonicera*, *Rubus*, and *Smilax* had smothered it out. Then as my last hope was about to vanish, I spotted something in bloom under a dense canopy of vines (Figure 3; page 14). I got very excited. Could this be what I was searching for? Yes it was!

After my unsuccessful attempt last year, today I hit pay dirt. Finally I found the rare and elusive purple fringeless orchid - *Platanthera peramoena* (Figure 4;

page 15)! One lone plant was struggling to live under a suffocating mat of vines. With my hopes raised I continued the search. Nearby I found more plants, more than a dozen in all, scattered throughout the seepage area. Indeed this was a wonderful treasure to find. Seeing this wildflower for the first time I realized how appropriate the species name is for it means "very beautiful." In direct sunlight the flowers are 'bubblegum' pink (Figure 5; page 15).

I took some time to absorb the experience, capture some images, and marvel at the grandeur of this orchid. To find this plant was painful at times. I have the scratches to prove it. Yet it was well worth the effort to see and photograph this spectacular plant. I can't wait until next year for a return visit to witness this botanical gem in its full glory.

The purple fringeless orchid grows 50 to 90 cm (20 to 36 inches) tall, and bears an inflorescence of violet to pink flowers. The flowers are bilaterally symmetrical with the lower petal deeply divided into three wedge-shaped segments with finely dentate edges. The lowermost segment is partially split by a single central notch. Blooming occurs in July and August. The leaves are long and narrow, 10-20 cm (4-8 in) long at the bottom of the stem, and shorter toward the inflorescence.

It is important to note that *P. peramoena* is rare because it requires a specific habitat. This species lives in bogs, seepages and moist forests, all of which are disappearing due to development. It is also rare in South Carolina and Virginia, and is listed as a 'Special Concern' species in Georgia. This species is vulnerable to changing land use practices including timber harvesting and drainage of wetlands. It is these factors that have contributed to the plant's imperiled status across the eastern United States. Only through protection of natural areas like Dial Creek and the surrounding hardwood forests can this unique native plant continue to survive.

[Hill Demonstration Forest and Dial Creek Hardwood Forest Dial Creek is located within the Hill Forest area. It is a Registered Heritage Area owned by North Carolina State University Forestry Foundation.]

Winter Orchid Huntin'

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Winter winds whipped wickedly through the tree limbs scraping them against one another. Big wet globs of snow came down fast and furious. Quickly, yards, gardens, and parked cars were coated with a fresh white blanket. As I gazed out the large front room picture window from the comfort of my stuffed rocker, I could survey the rapidly unfolding scene. Pedestrian traffic had ceased. Vehicular traffic snarled to a crawl. Many motorists out of frustration gesticulated wildly and seemed to be uttering language not used in polite company. It was now evening rush hour and so I turned on the news of the day. Reporters were out and about reporting on the foul weather. The weather report was for clearing by the weekend with temperatures rising from the teens and twenties to a balmy freezing mark with mostly sunny skies. Perfect, I thought to myself. Perfect for huntin' orchids. This guy must be nuts you think. Yes, but that is a long story for another time. For now suspend your disbelief and join me for an invigorating walk into winter woodland. I think I can suggest another way to fill the void in our native orchid activities during the non-blooming season. What I refer to is the striking beauty of orchid leaves of those species that put on a real show once the forest canopy has opened up.

My reasoning is that once the leaves have fallen the tawny leaf litter can be the perfect background for things still dressed in green. There are a number of orchid genera with either basal rosettes of overwintering leaves, or those that put up a single leaf only to last through winter into spring when the forest canopy reappears.

The genus *Goodyera* consists of some 25 species worldwide (Case, F.W., Jr. 1987. Orchids of the Western Great Lakes Region. Cranbrook Institute of Science. Bloomfield Hills, Michigan. 251 pp.) with four present in varying degrees in North America. These so-called rattlesnake plantain orchids are known not so much for their racemes of tiny white flowers but for the intricate beauty of the patterns on their leaves. All four species have closely packed basal rosettes of alternate leaves. The venation and other color attributes on these leaves are not only an attraction, but combined with floret features, distinguish the genus and the species within.

Certainly the most common of the four species in Ohio, *Goodyeara pubescens* (downy rattlesnake-plantain; image on page 16) qualifies as photogenic. As with the other species, the next season inflorescence arises from nodes and terminal portions along the rhizomes. This network of rhizomes may become extensive enough with age to produce a good-sized colony of basal leaf ro-

settes. Each leaf has a rather uniform green color punctuated with broad white lines that parallel the mid-vein. Secondary white lines gently curve from the mid-vein toward margins while tertiary veins wind in a reticulate wandering pattern throughout. If you return to the patch during bloom season, notice how hairy the entire flowering scape, as well as individual florets, are. Each flower has a very rounded overall appearance with a saccate lip.It is no wonder all four species are targets of those who would collect them for their own purposes.

I have to venture outside of Ohio to find *Goodyera oblongifolia* (giant rattlesnake-plantain; image on page 16) perhaps the largest of the four species. This species has solid green leaves with the mid-vein paralleled on each side by a broad, feathered white line. Having said that, with all four species there are exceptions to the expected color pattern. Some specimens have hardly any or no striping or color suffusions. In comparison with the previously mentioned species, this has no less striking an appearance. In fact, limited to only the white parallel lines, it may even be more impressive.

Another species which was known from Ohio is the checkered or tessellated rattlesnake-plantain (*Goodyera tesselata*). Its last recorded sighting in Ohio was in 1929. This boreal species features leaves with silvery white streaks and blotches contrasting well with the greens that vary from light to darker patches. Were you to visit these plants again during bloom season you would see each flower with a typical-for-the- genus saccate lip but the other five flower parts ascending as if some masked gunman had walked in and ordered everyone to put their hands up. In defiance, the lip first juts outward, then droops downward. This species and the next are the source of considerable confusion as they frequently hybridize.

Another non-Ohio dwelling resident is *Goodyera repens* (variously called the dwarf, creeping, or lesser rattlesnake-plantain). With so many common names it must be running from the law. It certainly won't run from your camera while showing off blue-green and more oval leaf shapes than the other species. Some authors assign two varieties to this species. The separation is in good part based upon the venation patterns. Some specimens show hardly any while others have prominent venation. So too appear the various splashings of color upon the blue-green leaf background. Some leaves show different green blotches while others look more yellowish and some specimens nothing at all. Viewing these orchids during flowering season, one observes a very triangular, apically pointed lip seeming to be inserted within the protective surroundings of the other five flower parts.

Now I realize you have been outdoors looking at and photographing orchids for some time. But there is no need to run off back to the warmth of your house so quickly. We've got more winter orchid leaf hunting to do.

Cranefly orchid (*Tipularia discolor*) an Ohio resident, has evolved a strategy for taking full advantage of the penetration of light to the otherwise dark forest floor once the leaves have dropped in the autumn. This species has gained an evolutionary advantage by sending up a leaf which can photosynthesize through winter and into spring until the new canopy unfurls and again cuts off light to the forest floor.. This surprising strategy is paralleled in both tropical rain- and cloud-forests. While those plants do not have the extensive seasonal leaf fall, the problem of darkness on the forest floor is the same.

Enough on evolution. Let's do what we came for and look at the handsome leaves. Each leaf is dark green on topside, acuminate tipped, and so strongly veined that they appear pleated. Do not forgo the visual treat of observing and photographing the beautiful undersides which are a rich royal purple. What more could you ask for? It should be stated that another adaptive trait manifest by this orchid leaf is the principal of counter shading. We know that dark colors absorb light. Therefore, the dark undersides catch the bounce of rays off the forest floor in another parallel to what many plants do in rain- and cloud-forest understories.

Putty Root orchid (*Aplectrum hymale*) an Ohio resident, follows a similar evolutionary leaf strategy to photosynthesize while the forest canopy has opened up. This species has longer and wider leaves than *T. discolor*. It also rivals it in handsome color array. Picture the closely clustered basal leaves showing off a pinstripe color pattern of alternating green and grey to silvery white lines all parallel to the leaf margin. Maybe these orchids are Yankee fans, but I will forgive them as their colors are a photogenic prize.

I hope you have enjoyed this brief walk and photo session out into the winter landscape to look for interesting orchid leaves that keep the spirit alive through the long northern winter. Getting out and about at these times brings back memories of the more exciting time of year when we get to see the actual blooms. Having said that, it is comforting to know there are still ways to indulge our passion in the off season. Now it is time to get back inside. I'm chilled to the bone.

END NOTES

Spiranthes diluvialis Sheviak near Carbondale, Colorado

(based on 'Rare flower species found near Carbondale' published on www.aspentimes.com on 20 December 2007, by Scott Condon, Aspen, Colorado)

An orchid species not previously know from the area was discovered in the Roaring Fork Valley on Colorado's Western Slope in the summer. "The Ute ladies'-tresses (*Spiranthes diluvialis* Sheviak) was found in a wet meadow off Catherine Store Road near Carbondale by two consultants, botanist Mindy Wheeler and biologist Eric Patterson. They were surveying wetlands in the area when Wheeler made the discovery while the orchid was blooming."

It was reported that while the initial discovery occurred on private property, the species was subsequently discovered on adjacent U.S. Bureau of Land Management property and on a wetland mitigation site owned by the city of Carbondale.

This new location for the orchid is a range extension for the species according to the U.S. Fish and Wildlife Service's Ecological Services office in Grand Junction, Colorado. The population was described as 'healthy, robust population' and the habitat 'ideal.'

Spiranthes diluvialis is currently considered threatened under the U.S. Endangered Species Act. Ecologists and biologists are concerned that the habitat (wetlands, river bottoms, and irrigated meadows) may be disappearing and the orchids in the newly found location are supposedly not well protected.

U.S. Fish and Wildlife has shared the information with Colorado Native Plant Society and local consultants, and has alerted local governments in surrounding counties in an effort to call for preservation of the orchid's habitat. The exact location of the sightings was not disclosed to protect the orchid population and its fragile habitat.

Native Orchid Conference, Inc. Makes Donation to the Friends of the Florida Panther National Wildlife Refuge

Scott Stewart, Shawnee Mission, Kansas

The Native Orchid Conference, Inc. (NOC) has made a donation to the Friends of the Florida Panther National Wildlife Refuge as part of the group's commitment to the 1% For Orchid Conservation program. Kip Knudson, Chairperson of the Native Orchid Conference Conservation Committee, said, "This $50 donation to the Friends group will go toward supporting the ongoing native orchid conservation and reintroduction research at the Florida Panther National Wildlife Refuge." Knudson went on to say that the donation, while small, was already earmarked for the purchase of laboratory and greenhouse supplies at the refuge that will go toward supporting the eventual reintroduction of several different orchid species into the Florida Panther National Wildlife Refuge. Speaking about the impact of the donation, Larry Richardson, Wildlife Biologist at the refuge, said, "The donation by the Native Orchid Conference will help further our research efforts here at the refuge by providing funding for the basic supplies necessary to grow native orchids both in the lab and in the greenhouse." Richardson continued, "Support such as this from the Native Orchid Conference simply reinforces the good orchid conservation work going on here at the refuge." Knudson added, "By supporting conservation activities such as this, the NOC and the Conservation Committee are helping to insure that others can enjoy native orchids in their natural habitats in the future." The NOC donation will have an immediate impact on the refuge's orchid conservation program, as it will help purchase supplies for new rounds of research and propagation being conducted at the on-site laboratory and greenhouse facilities by refuge staff, volunteers, interns, and undergraduate and graduate students.

The Florida Panther National Wildlife Refuge consists of 26,400 acres of pine forests, cypress domes, strand swamps, wet prairies, hardwood hammocks, and ponds, and was established in 1989. While the refuge's primary goal is the protection of the Federally endangered Florida panther, the refuge is home to nearly 30 species of orchids in over 12 genera—including the state endangered and North American Orchid Specialist Group Flagship Taxa ghost orchid (*Dendrophylax lindenii*). Since 2002, the refuge has partnered with Dr. Michael Kane's research program at the University of Florida and Dr. Lawrence Zettler's research program at Illinois College to study the ecology, propagation, pollination biology, and reintroduction of orchids within the refuge boundaries. Currently, this group is conducting research that may lead to the reintroduction of several native orchid species, some of which include *Cyrtopodium punctatum*, *Dendrophylax lendenii*, *Bletia purpurea*, *Eulophia alta*, *Epidendrum nocturnum*, and *Calopogon tuberosus* var. *tuberosus* and var. *simpsonii*.

NOC, Inc. 2008 Annual Meeting!
Appalachian West Virginia & Pennsylvania
18-21 July, 2008

Our 7th annual conference is to be held at West Virginia University (WVU) in Morgantown, WV - the heart of Appalachia. WVU is located about one hour south of Pittsburgh, PA and is a fantastic, modern facility complete with all the amenities necessary for conference purposes. WVU is situated at the center of the upper portion of the Ohio River drainage basin which is home to 60 species, 4 varieties, and 3 hybrid native or naturalized orchids. Conference field trips should provide participants with the opportunity to see at least 20 orchid species including more than a dozen which will be in bloom at the time of the conference.

The conference schedule will include an initial day of meetings or presentations on Friday the 18th followed by an all-day field trip on Saturday the 19th into the low mountains of southern and central Pennsylvania. Orchids to be expected in bloom on this trip include: *Epipactis helleborine, Goodyera pubescens, Goodyera tesselata, Gymnandeniopsis clavellata (Platanthera clavellata), Listera smallii, Malaxis unifolia, Platanthera ciliaris, Platanthera peramoena,* and *Spiranthes lacera* var. *lacera*

We will rest-up from our orchid outing as we resume presentations on Sunday the 20th and will finish the conference with a final day afield on Monday the 21st. This trip will be into the Appalachian Mountains of east central West Virginia where we will visit the world famous Cranberry Glades Botanical Area. Participants will likely observe the following orchids in bloom: *Corallorhiza bentleyi, Corallorhiza maculata* var. *maculata, Goodyera pubescens, Goodyera repens* var. *ophioides, Gymnandeniopsis clavellata* (*Platanthera clavellata*), *Platanthera ciliaris, Platanthera grandiflora,* and *Platanthera peramoena*.

Other updates on the 2008 Conference are available at the NOC website (http://tech.groups.yahoo.com/group/NativeOrchidConference/).

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