



On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

Two Weeks and 38 Orchids In Western Newfoundland

Paul Martin Brown

One of the truly rewarding trips to be taken in North America is that of two weeks along the western and northwestern coast of Newfoundland, the island portion of the Province of Newfoundland and Labrador, in eastern Canada. Newfoundland is a large island that is the easternmost outpost of Canada and is often known as "The Rock" because of the minimal soils over the bedrock that comprises the island. Coastal northwestern Newfoundland is essentially limestone and often has large exposed barrens whereas many of the southwestern areas are large open bogs and marshes. The Appalachian Mountains of North America have their northern terminus in Newfoundland and the spectacular Gros Morne National Park is one of the gems of the national park system.

Roads are few, but for the most part in excellent repair and practically all of the prime orchid sites are roadside areas or quite nearby. Getting there requires either flying into St. John's and renting a vehicle and then driving across the entire island, which can take more than a day, or starting at North Sidney, Nova Scotia and taking the ferry across to Channel Port aux Basques on the southwestern tip of the island. I find this preferable, as it is the starting point for the trip and it takes less driving time than crossing back and forth to St. John's. Regularly scheduled air transportation is available to Sidney, as well as car rentals, and it is only a short drive to North Sidney and the ferry terminal.

Because of the brief and contracted spring/summer season thirty-eight species, three varieties, and four hybrids of wild orchids may be seen in flowers in the short span of two weeks. In addition numerous color and growth forms may be encountered. The ideal time to go is in early July when the northern spring is just finishing up in the southern areas. When you return to the south two weeks later summer will be in full swing.

Our trip starts in the port town of Channel Port aux Basques. After leaving the village Route 1 is the only choice for a trip north. Shortly you will be within large open bog areas, which abound with *Arethusa bulbosa*, the **dragon's-mouth orchid**. Large clumps of showy bright pink flowers on 6-8" stems are easy to find along the old railroad line that is now a hiking trail. Both the white-

flowered forma *albiflora* and the very rare lilac blue flowered forma *subcaerulea* can be found here. This will not be the last of the *Arethusa* that you will see, but these are by far the easiest to get to. Only a few kilometers north is the entrance to J.T. Cheeseman Provincial Park. Be sure to visit the park and walk the nature trail watching for *Cypripedium acaule*, the **pink lady's-slipper**, or **moccasin flower** still in bloom. This is the only area where you are still sure to find this spring beauty in flower at this time. Occasionally the white-flowered form, forma *albiflorum* may be seen. When you return two weeks later this trail will be your last stop and will have many orchids in flower including *Goodyera repens*, **lesser rattlesnake orchis**; *Goodyera tessellata*, **checkered rattlesnake orchis**; *Liparis loeselii*, **Loesel's twayblade** or **fen orchis**; *Listera cordata*, **heart-leaved twayblade**; *Platanthera blephariglottis*, **northern white fringed orchis**; *P. clavellata* var. *ophioglossoides*, **northern club-spur orchis**; *P. dilatata*, **tall white northern bog orchis**; *P. lacera*, **green fringed orchis** or **ragged orchis**; *P. orbiculata*, **pad-leaved orchis** and its ecological dwarf forma *lehorssii*; *P. psycodes*, **small purple fringed orchis**, often with the frequent forma *albiflora*; *P. xandrewsii*, **Andrews' hybrid fringed orchis**; *Pogonia ophioglossoides*, **rose pogonia**; and *Spiranthes romanoffiana*, **hooded ladies'-tresses**.

If you have not had enough of the local bogs as you drive northward you will soon come to an enormous area on the right called Blow Me Down, near a marked area called The Tolt. It was here that the trains were blown off the track by the winter winds. Again, the dragon's mouth is scattered throughout the bog and this time accompanied by both *Pogonia ophioglossoides*, **rose pogonia** and *Calopogon tuberosus*, **common grass-pink** just starting to flower. If these two are not quite out yet do not despair, as you will have thousands of them further north.

A leisurely drive north will take you to Corner Brook, home of Sir Wilfred Grenfell College, and a bustling northern city. Many good accommodations and restaurants are to be found here. After a restful night, the morning's journey will continue northward towards Rocky Harbour and Gros Morne National Park. In Deer Lake you will take Route 430 north. It is advisable to drive directly to Rocky

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Save the Date
Annual Dinner: November 7, 2003
Ann Zwinger, Speaker

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Harbour, get settled, and plan your trips for the area, for you will want several days here. Comfortable half and full day trips may be made to many of the nature trails within the National Park and good maps and directions can be found at the park headquarters. Orchids can be found on most all of the trails but the two major orchid-laden areas are the Lamond Trail off of Route 131 west of Wiltondale (you passed it on the way here) and the lower elevation section of the Gros Morne Trail.

Accessed by an excellent boardwalk and trail, the Lamond Trail has one of the largest populations of the utterly spectacular *Cypripedium reginae*, the **showy lady's-slipper** with its often 2- and 3- flowered stems with large pink and white slippers growing 75 cm tall! It is estimated that there are over 25,000 plants in this swamp. Scattered along the trail and in the woodland beyond the swamp are excellent stands of *Corallorhiza maculata* var. *maculata*, **spotted coralroot**, with both the forma *flavida* and forma *rubra*; *C. maculata* var. *occidentalis*, **western spotted coralroot**; *C. striata*, **striped coralroot** (a recent find and so far only in the striking forma *eburnea*); *C. trifida*, **early coralroot**; *Cypripedium parviflorum* var. *pubescens*, **large yellow lady's-slipper**; *Listera convallarioides*, **broad-lipped twayblade**; *L. cordata*, **heart-leaved twayblade**; *Platanthera huronensis*, **green bog orchis**; *P. aquilonis*, **northern green bog orchis**; *P. macrophylla*, **Goldie's pad-leaved orchis**; *P. orbiculata*, **pad-leaved orchis**; *P. psycodes*, **small purple fringed orchis**; and *Malaxis unifolia*, **green adder's-mouth**.

The main hiking trail to Gros Morne, just south of Rocky Harbour, offers many good orchids along the trailsides of the lower slope. If one is physically able, the entire hike to the top is spectacular, but long and very arduous towards the summit. The broad tablelands on top afford an unparallel view of eastern Canada. Starting right in the parking lot watch the trailsides carefully for twayblades, both the broad-lipped and *Listera auriculata*, **auricled twayblade**, as well as the heart-leaved, rattlesnake orchids, pad-leaved orchises and many coralroots. The trail is well maintained and is a series of open footpaths, boardwalks, and stairways.

The real gem of this area is the Rocky Harbour Bog. It

is a bit difficult to find and unmarked, but if you make inquiries at the National Park headquarters, they may be able to point out the entry access along the highway. After you climb up (yes, the bog is above the road and is actually a raised heath) and into the bog you will find endless acres of orchids, carnivorous plants, and other spectacular wildflowers. All three of the bog orchids, *Calopogon*, *Pogonia*, and *Arethusa* can be found here and in all of their color forms. The white fringed orchis also occurs here a bit later in the summer. I expect there are in excess of 100,000 orchid plants growing within the Rocky Harbour bog!

If time permits, be sure to take a ride to the Tablelands near Trout River. Although not an orchid area, the expansive serpentine barrens offer an unusual collection of highly specialized plants and scenery.

These first few days have been but an introduction to the orchid wonders of Newfoundland. Now for the serious orchid hunting! About an hour or so north of Rocky Harbour you will come to Bellburn flats area and the Table Point Reserve, near an old grass airstrip. This is one of the premier orchid sites on the island. You can easily pull off onto the access road and start to explore. The brilliant yellow patches you see scattered throughout the flats are those of the **large yellow lady's-slipper**, *Cypripedium parviflorum* var. *pubescens*. They occur here in the thousands. The plants appear to be only a few inches tall, but much of their stems are within the dense dwarf shrub layer. You will see great variation within these plants. The extreme variation was originally described var. *planipetalum*, having broad, flat petals rather than slender twisted petals. Recent work has demonstrated that this growth form is an extreme expression of habit and not consistent from year to year or even with a given clump. Nevertheless it is the most sought after form by most photographers. Nestled deep within the shrub layer will be a few scattered plants of *Platanthera hookeri*, **Hooker's orchis**, in its dwarf form, forma *abbreviata*. Several species of orchids had named variations described from Newfoundland. Some of these are extreme expressions as in the flat-petalled yellow lady's-slipper while others are ecological dwarves. This form of Hooker's orchid is one of the latter as is *Platanthera orbiculata*, **pad-leaved orchis**, forma *lehorsii*, that is to be found primarily in the southwestern headlands.

Your next stop will be at Plum Point, Make reservations early at Plum Point Motel and Cabins, for it is just about the only place to stay in northwestern Newfoundland that is suitable for your exploring purposes. Plan several days here, as there are many full day trips to be made. After getting settled and consulting the maps these are the places you will want to visit.

- **Port au Choix National Park** for the hundreds of yellow lady's-slippers and broad-lipped twayblades. It is here that you will start to see one of Newfoundland's orchid specialties, *Pseudorchis straminea*. One of the rarest orchids in North America, it is locally abundant from here north to Cape Norman. On the way back to Plum Point be sure to stop off at Reef's Harbour and search for the many *Malaxis brachypoda*, **white adder's-mouth** and the unusual forma *bifolia* that abound in the grassy slopes by the boat launching area.
- **Cape Norman and Cook's Harbour** on Route 435 is the site of the northernmost lighthouse on the island. The broad open tundra-like flats often have a variety of orchids nestled within them. Watch for the many other spectacular wildflowers as well. Icebergs are regularly seen here.
- **Burnt Cape**, across from Cape Norman, is one of the all-time favorite places to explore. From the tiny town of Raleigh on Route 437 cross the causeway on to Burnt Island and drive to your right out to the Cape. The large cigar-shaped island is nearly barren of trees and sliced with deep ravines that run the length. The gravel roads are good and travel is easy. Towards the end of the island, at a picnic area that is just opposite the town of Raleigh on the mainland is the real attraction - *Calypso bulbosa* var. *americana*, **eastern fairy-slipper**, and the type locality for the forma *rosea*. You have to search carefully and watch your step in and around the ravines but within the sides of them, and occasionally on the top edges, are to be found the calypsos. Other species that are scattered on the cape include *Coeloglossum viride* var. *viride*, **northern bracted green orchis**; *Corallorhiza trifida*, **early coralroot**; *Goodyera repens*, **lesser rattlesnake orchis**; *Listera borealis*, **northern twayblade**; *L. cordata*, **heart-leaved twayblade**; *Platanthera clavellata* var. *ophioglossoides*, **northern club-spur orchis**; *P. obtusata*, **blunt-leaved rein orchis** forma *collectanea*; and *Pseudorchis straminea*, **Newfoundland orchis**. Several interesting and unusual ferns can also be found here and the whale watching is excellent!
- **Watts Point Preserve** - this is the only out of the way stop that is recommended. Driving north when route 430 turns east at Eddie's Cove continue for 2-3 km to the wide-open barrens of the preserve. Exploring areas on both sides of the road, but particularly on the east, you will find tens of thousands of *Amerorchis rotundifolia*, **small round-leaved orchis**. These are

some of the smallest plants I have ever seen of this species (some no more than 2 or 3 cm tall) and the alternative common name, flyspeck orchid, seems apt. Small roadside scrapes often yield large numbers of *Malaxis brachypoda*, **white adder's-mouth**. Numerous other wildflowers that are only found across the strait in Labrador are also found here. It needn't be a long stop, but well worth it.

- From an historical perspective you may want also to visit L'Anse aux Meadows, site of the first Viking establishment in North America, at the terminus of Route 436.

The last area to be suggested is somewhat apart from all of these. It is **Tilt Cove** on the Baie Verte peninsula. As you begin your trek back to southwestern Newfoundland you may want to revisit the Lamond Trail for later flowering species and then take Route 1 east and eventually Route 410 north to Baie Verte. Not far from Baie Verte (which has a very nice hotel and an excellent small mineral museum) is the small community of Tilt Cove off Route 414. This area is most unusual as it lies in a serpentine area and where there was extensive copper mining. The town is at the bottom of a large basin that opens to the sea to the north. Most of the town is abandoned now after two major heydays in its history. A few of the homes are still occupied and a small museum is also open. But the real attraction here is the presence of *Dactylorhiza praetermissa*, **southern marsh orchid**, a species found throughout northern Europe. First thought to be either an escape or adventive, the species presence has been traced back at least 100 years and may be truly native. It occurs in large, showy clumps on the seepage hillsides throughout the bowl of the town. Other orchids accompany the marsh orchid and include *Platanthera dilatata*, **tall white northern bog orchis**; *P. aquilonis*, **northern green bog orchis**; *P. huronensis*, **green bog orchis**; and *Spiranthes romanzoffiana*, **hooded ladies'-tresses**.

By now your two weeks are coming to a close and you will be heading south to Corner Brook once more. On your last day afield driving south towards Port au Basque, watch in the vicinity of Doyles for roadside meadows with hundreds of fringed orchises. Both purple fringed species, *Platanthera grandiflora* **large purple fringed orchis** and its various forms - forma *albiflora*, forma *bicolor*, forma *carnea*, forma *mentotonsa*; *P. lacera*, **green fringed orchis** or **ragged orchis**; *P. psycodes*, **small purple fringed orchis** and the forma *albiflora*, forma *ecalcarata*, forma *rosea*, forma *varians* and the hybrids *P. xandrewsii*, **Andrews' hybrid fringed orchis** and *P. xkeenanii*, **Keenan's hybrid fringed orchis** are to be found in many roadside areas. Do not forget to return to Cheeseman Park before you leave to check on the later flowering species.

Note; Three species are found in restricted areas and are not particularly easy to locate.

Epipactis helleborine, **broad-leaved helleborine**, is starting to show up in some of the more urban areas, particularly around St. Johns in the east and Corner Brook in the west. Look around some of the local city parks for this recent visitor from Europe.

Goodyera oblongifolia, **giant rattlesnake orchis**, is known from only one area near Serpentine Lake. It would flower in late July, but the road in is difficult and often gated. Perhaps you will be the one to find it elsewhere!

Piperia unalascensis, **Alaskan Piperia**, was recently discovered near Stephenville. This species is a common plant of western United States with a few disjunct localities in the upper Great Lakes and on Anticosti Island as well as the Gaspé region of Quebec. It was not a great surprise to find it in western Newfoundland.

IF YOU GO:

Although it is summer the weather in July is highly variable from very warm along the southwest coast to cold and possibly sleet/light snow showers at Cape Norman and it is often very windy. You need to bring layered clothing and a waterproof jacket or poncho. At Plum Point Motel there are laundry facilities as well as a general store nearby. Be

sure to fuel up your vehicle each **evening** as the gas stations tend not to open early in the mornings (we have had to wait as late as 10AM to get gas some mornings!).

It is best to pack a lunch, or have the restaurant do it, as local restaurants are not easy to find and never seem to be where you are. The Ocean View Motel in Rocky Harbour and Plum Point Motel both have superior dining facilities. The little store in Raleigh (Burnt Cape) has wonderful home made-pies for take out. Don't miss them.

Two very good eating places along the road are the Pasadena Family Restaurant in Pasadena just north of Corner Brook (Pasadena is also an alternative to Corner Brook for accommodations) and Maynard Motor Inn, PO Box 59, Hawkes Bay, Newfoundland (709) 248-5225. They also have excellent accommodations and are about 1 hour south of Plum Point.

- A curious note: I found it almost impossible to get a proper cup of tea in western Newfoundland. I ended up carry my own teapot and tea with me and having the restaurants prepare it - you need to specify that you want the water to be boiling- it seems that teapots do not exist in the public dining rooms there!

Checklist Of The Orchids Of Western Newfoundland

1. *Amerorchis rotundifolia* (Banks ex Pursh) Hultén
small round-leaved orchis

2. *Arethusa bulbosa* Linnaeus
dragon's-mouth

forma *albiflora* Rand & Redfield
forma *subcaerulea* Rand & Redfield

3. *Calopogon tuberosus* (Linnaeus) Britton, Sterns, & Poggenberg

common grass-pink

forma *albiflorus* Britton

Catling, P.M. and Z. Lucas. 1987. *Rhodora* 89: 401-413.

4. *Calypso bulbosa* (Linnaeus) Oakes var. *americana* (R.Brown) Luer

eastern fairy-slipper

forma *albiflora* P.M. Brown
forma *rosea* P.M. Brown

Brown, P.M. 1995. *NANOJ* 1(1): 17.

5. *Coeloglossum viride* (Linnaeus) Hartman var. *viride*
northern bracted green orchis

Bateman, R.M., A.M. Pridgeon, and M.W. Chase 1997. *Lindleyana* 12(3): 129.

5a. *Coeloglossum viride* (Linnaeus) Hartman var. *virescens* (Mühlberg) Luer

long bracted green orchis

6. *Corallorhiza maculata* (Rafinesque) Rafinesque var. *maculata*

spotted coralroot

forma *flavida* (Peck) Farwell

forma *rubra* P.M. Brown

Brown, P.M. 1995. *NANOJ* 1(1): 8.

6a. *Corallorhiza maculata* (Rafinesque) Rafinesque var. *occidentalis* (Lindley) Ames

western spotted coralroot

forma *aurea* P.M. Brown

forma *immaculata* (Peck) Howell

forma *intermedia* Farwell--brown-stemmed

form

forma *punicea* (Bartholomew) Weatherby & Adams

Brown, P.M. 1995. *NANOJ* 1(3): 195.

Freudenstein, J.V. 1986. *Contributions from the University of Michigan Herbarium* 16: 145-153.

----- 1997. *Harvard Papers in Botany* 10:5-51.

7. *Corallorhiza striata* Lindley

striped coralroot

forma *eburnea* P.M. Brown

Brown, P.M. 1995. *NANOJ* 1(1): 9.

8. *Corallorhiza trifida* Chatelain
early coralroot
9. *Cypripedium acaule* Aiton
pink lady's-slipper, moccasin flower
forma *albiflorum* Rand & Redfield
10. *Cypripedium parviflorum* Salisbury var. *makasin* (Farwell) Sheviak
northern small yellow lady's-slipper
Sheviak, C.J. 1993. *AOS Bulletin* 62(4): 403.
-----, 1994. *AOS Bulletin* 63(6): 664-669.
-----, 1995. *AOS Bulletin* 64(6): 606-612.
-----, 1996. *NANOJ* 2(4): 319-343.
- 10a. *Cypripedium parviflorum* Salisbury var. *pubescens* (Willdenow) Knight
large yellow lady's-slipper
Sheviak, C.J. 1994. *AOS Bulletin* 63(6): 664-669.
-----, 1995. *AOS Bulletin* 64(6): 606-612.
-----, 1996. *NANOJ* 2(4): 319-343.
11. *Cypripedium reginae* Walter
showy lady's-slipper
forma *albolabium* Fernald & Schubert
12. *Dactylorhiza majalis* (Reichenbach) Summerhayes subsp. *praetermissa* (Druce) D.M. Moore & Soo
southern marsh orchid
Newfoundland; Europe
forma *albiflora* (Druce) P.M. Brown
Brown, P.M. 2001. *NANOJ* 7(2): 186.
Catling, P.M. and C.J. Sheviak. 1993. *Lindleyana* 8(2): 80-81.
Meades, S. 1994. *Saraccenia*. 5(1): 13-15.
-----, 1995. *NANOJ* 1(3): 245.
13. *Epipactis helleborine* (Linnaeus) Cranz
broad-leaved helleborine
Brown, P.M. 1996. *NANOJ* 2(4): 316.
14. *Goodyera oblongifolia* Rafinesque
giant rattlesnake orchis
15. *Goodyera repens* (Linnaeus) R. Brown
lesser rattlesnake orchis
forma *ophioides* (Fernald) P.M. Brown
Brown, P.M. 1995. *NANOJ* 1(1): 14.
16. *Goodyera tessellata* Loddiges
checkered rattlesnake orchis
17. *Listera auriculata* Wiegand
auricled twayblade
forma *trifolia* (Lepage) Lepage
18. *Listera borealis* Morong
northern twayblade
forma *trifolia* Lepage
19. *Listera convallarioides* (Swartz) Nuttall
broad-lipped twayblade
forma *trifolia* P.M. Brown
Brown, P.M. 1995. *NANOJ* 1(1): 11.
20. *Listera cordata* (Linnaeus) R. Brown var. *cordata*
heart-leaved twayblade
forma *disjuncta* Lepage
forma *trifolia* P.M. Brown
forma *viridens* P.M. Brown
Brown, P.M. 1995. *NANOJ* 1(1): 11; 1(4): 288.
- Listera xveltmanii* Case
Veltman's hybrid twayblade
(*L. auriculata* x *L. convallarioides*)
21. *Malaxis brachypoda* (Gray) Fernald
white adder's-mouth
forma *bifolia* (Mousley) Fernald
22. *Malaxis unifolia* Michaux
green adder's-mouth
23. *Piperia unalascensis* (Sprengel) Rydberg
Alaskan piperia
24. *Platanthera aquilonis* Sheviak
northern green bog orchis
Sheviak, C.J. 1999. *Lindleyana* 14(4): 193-203.
25. *Platanthera blephariglottis* (Willdenow) Lindley
northern white fringed orchis
26. *Platanthera clavellata* (Michaux) Luer var. *ophioglossoides* (Fernald) P.M. Brown
northern club-spur orchis
Brown, P.M. 1988. *Wild Flower Notes* 3(1): 21.
27. *Platanthera dilatata* (Pursh) Lindley
tall white northern bog orchis
28. *Platanthera grandiflora* (Bigelow) Lindley
large purple fringed orchis
forma *albiflora* (Rand & Redfield) Catling
forma *bicolor* P.M. Brown
forma *carnea* P.M. Brown
forma *mentotonsa* (Fernald) P.M. Brown
Brown, P.M. 1988. *Wild Flower Notes* 3(1): 22.
-----, 1995. *NANOJ* 1(1): 12.
Stoutamire, W.P. 1974. *Brittonia* 26: 42-58.

29. *Platanthera hookeri* (Torrey) Lindley

Hooker's orchis

forma *abbreviata* (Fernald) P.M. Brown
Brown, P.M. 1995. *NANOJ* 1(1): 14.

30. *Platanthera huronensis* (Nuttall) Lindley

green bog orchis

31. *Platanthera lacera* (Michaux) G. Don

green fringed orchis, ragged orchis

Catling, P.M. 1997. *Lindleyana* 12(2): 79-88.

32. *Platanthera macrophylla* (Goldie) P.M. Brown

Goldie's pad-leaved orchis

Brown, P.M. 1988. *Wild Flower Notes* 3(1): 23.
Reddoch, A.H. and J.M. Reddoch 1993. *Lindleyana* 8(4): 171-188.

33. *Platanthera obtusata* (Banks ex Pursh) Lindley

blunt-leaved rein orchis

forma *collectanea* (Fernald) P.M. Brown
forma *foliosa* P.M. Brown
Brown, P.M. 1995. *NANOJ* 1(1): 13-14.

34. *Platanthera orbiculata* (Pursh) Lindley

pad-leaved orchis

forma *lehorsii* (Fernald) P.M. Brown
forma *trifolia* (Mousley) P.M. Brown

35. *Platanthera psycodes* (Linnaeus) Lindley

small purple fringed orchis

forma *albiflora* (R. Hoffman) Whiting & Catling
forma *ecalcarata* (Bryan) P.M. Brown

forma *rosea* P.M. Brown

forma *varians* (Bryan) P.M. Brown

Brown, P.M. 1988. *Wild Flower Notes* 3(1): 24.
-----1995. *NANOJ* 1(4): 289.
Stoutamire, W.P. 1974. *Brittonia* 26: 42-58.

Platanthera xandrewsii (Niles) Luer

Syn: *Platanthera lacera* (Michaux) G. Don var. *terraenovae* (Fernald) Luer

Andrews' hybrid fringed orchis

(*P. lacera* x *P. psycodes*)

Catling, P.M. and V. Catling. 1994. *Lindleyana* 9(1): 19-32.

Platanthera xkeenanii P.M. Brown

Keenan's hybrid fringed orchis

(*P. grandiflora* x *P. lacera*)

Brown, P.M. 1993. *A Field Guide to the Orchids of New England and New York*. p. 189.
Catling, P.M. and V. Catling. 1994. *Lindleyana* 9(1): 19-32.

36. *Pogonia ophioglossoides* (Linnaeus) Ker-Gawler
rose pogonia

forma *albiflora* Rand & Redfield

37. *Pseudorchis straminea* (Fernald) Soo

Newfoundland orchis

Reinhammar, L. 1995. *Nordic Journal of Botany* 15(5): 469-481.
-----1997. *NANOJ* 3(4): 407-425.

38. *Spiranthes romanzoffiana* Chamisso
hooded ladies'-tresses

Grant Announcement

The Native Plant Society of Northeastern Ohio hereby announces that it will consider applications and nominations for an Annual Grant to be awarded to an Ohio botanist that demonstrates excellence in research, conservation or education, to include land trusts, organizations and causes that clearly support the Mission of the Ohio Native Plant Society. The mission includes:

- Conservation of all native plants and natural plant communities through habitat protection and other means
- Public education and appreciation of native plants
- Proper ethics and methods of natural landscaping
- Surveys and research on native plants and publication of the information
- Cooperation with other programs and organizations concerned with the conservation of natural resources.

The amount of the grant will be \$500.00. Deadline for submissions is September 15.

HOW TO GET THERE

Via air to Sidney, Nova Scotia: most flights connect there through Toronto, Ontario.

Vehicle Rental: this is an excellent multi-vendor site for rentals.

<http://www.travelnow.com/cars/search.jsp?pageName=carSearch&cid=39241&pickUpCity=Sidney,NS,CA&validateCity=true&submitted=true>

Via Marine Atlantic Ferry Service from North Sidney, Nova Scotia to Channel Port aux Basques, Newfoundland full information may be found at their website:

http://www.marine-atlantic.ca/marinee/wheel/index_nav.htm

WHERE TO STAY**Channel-Port-au-Basque**

<http://www.gatewaytonewfoundland.com/accomodations.html#>

a variety of accommodations

Corner Brook

<http://www.accomodationsweb.com/canada/newfoundland/cornerbrook/>

many excellent accommodations

Ocean View Hotel

Route 430 North/Deer Lake

Rocky Harbour, Newfoundland AOK 4NO
Canada

<http://www.travelhero.com/prophome.cfm/id/79704/hotels/reservations/index.html>

Rocky Harbour

1. Channel Port aux Basques
2. Old railroad trail
3. Cheeseman Park
4. Corner Brook
5. Rocky Harbour/.Gros Morne National Park
6. Table Rock Preserve (Belburne's)
7. Plum Point
8. Burnt Cape (Raleigh)
9. Cape Norman
10. Watt's Preserve
11. Tilt Cove

Plum Point

<http://www.nfcap.nf.ca/west/PlumPoint/>

Plum Point Motel & Cabins

(try to get a cabin if you can as they are excellent and offer two or three rooms and good kitchen facilities)

Phone: 709-247-2355

Fax: 709-247-2327

Plum Point, NF.

A0K 4A0

<http://www.nfcap.nf.ca/west/PlumPoint/Motel.htm>

Baie Verte/Tilt Cove

<http://www.centralnewfoundland.com/bview17.php3>

Baie Vista Inn

P.O. Box 84

Baie Verte

Newfoundland, Canada

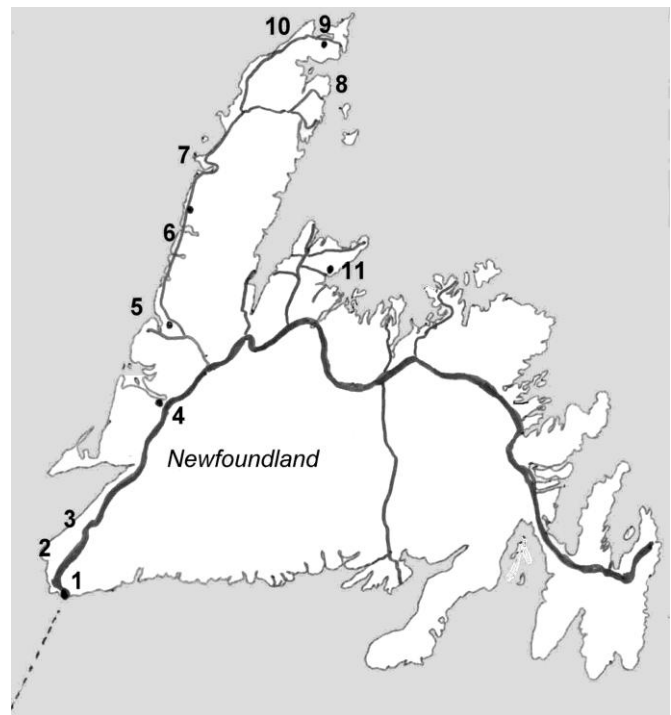
A0K 1B0

Phone: 709-532-8250

Toll Free: 1-877-532-8250

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Email: baie.vista@nf.sympatico.ca



Paul Martin Brown is a research associate at the University of Florida Herbarium at the Florida Museum of Natural History in Gainesville, Florida. He received his M.S. from the University of Massachusetts-Dartmouth and is the founder of the North American Native Orchid Alliance and editor of the *North American Native Orchid Journal*. Together with his partner Stan Folsom they published *Wild Orchids of the Northeastern United States* from Cornell University Press in 1997, *Wild Orchids of Florida* (2002) and *The Wild Orchids of North America north of Mexico* (2003) from University Press of Florida.

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Book Reviews

These two reference books will be an invaluable resource for those who wish to follow in Paul Martin Brown's footsteps in Newfoundland.

Native Orchids of Nova Scotia: A Field Guide. Carl Munden. University of Cape Breton Press, Inc., Sydney, Nova Scotia, 2001. ISBN 0-920336-77-9; \$39.95 Can.

In the forward to *Native Orchids of Nova Scotia*, author Carl Munden states that this book is written for the amateur who would like to identify orchids in the simplest way possible. The author proposes to accomplish that by matching plants to photographs. The photographs are located in the center of the book, a tactic used by printers to lessen the cost of a book of this sort, rather than having the photos next to the description of the plant where they would be of the most use. However, that complaint aside, the photos are of general habitat where the plant is found, the plant as a whole, and then close-ups of the bloom.

Beyond the amateur, this book may not be very useful. There is no key to the various genera in the orchid family, nor are there keys to species. An aid to the pictorial identification is matching orchids to habitats. The author briefly describes a variety of boreal plant habitats (*Sphagnum* bog edges, wet open areas, dry open areas, coniferous woodlands, mixed woodlands, deciduous woodlands). Because these plant communities are not sharply delineated, there is a great overlap among the orchids on the various habitat lists.

After the users of the book identify the orchid from the colored photos, they can turn to the index where the taxa are arranged by both common and scientific name. Within the description for each taxon, an outline map of Nova Scotia appears, with dots to indicate the regions where the orchid can be found. When two taxa look similar, for example *P. grandiflora* and *P. psycodes*, amateur illustrations showing differences are provided.

A table of contents would have been a nice addition. A chart of the flowering season, which may be a valuable aid to the user, is found at the back of the book.

For most orchids growing in Nova Scotia and in northern North American latitudes, *Native Orchids of Nova Scotia* can accomplish its mission for the interested amateur.

The Wild Orchids of North America, North of Mexico.

Paul Martin Brown. Drawings by Stan Folsom. University Press of Florida, Gainesville, Florida. 2003. 236 pp. (\$27.95 flexibind ISBN 9-780813-025728; \$49.95 cloth ISBN 9-780813-025711).

A book of a completely different sort is *The Wild Orchids of North America, North of Mexico* by Paul Martin Brown. One of the leading experts of North American native orchids, Brown uses wonderful color close-ups of the orchids next to the genus and species, both Latin and English, as well as the many forms. Each orchid has a beautiful drawing by the accomplished artist, Stanley Folsom.

There are no descriptions or discussions of the orchids as this was designed as an up-to-date checklist to complement Volume 26 of *The Flora of North America*, which contains the Orchidaceae. Not since Carlyle Luer's two-volume work has such a complete revision of the taxonomy appeared, along with the addition of newly discovered orchids. Following the checklist there is a special photo section of a selection of hybrids and color, leaf and growth forms. There is an excellent key to the wild orchids in the field and an appendix of the excluded orchids.

A Glossary, Bibliography, and Index are found at the end of the book, along with a personal checklist for the owner to fill in.

While many new books have come out in the past several years concerning orchids native to a particular state, this is the first comprehensive volume covering all of the orchids of North America, and as such it is a valuable reference for anyone traveling to various parts of the United States. In the September issue of the Journal we will cover two books for the snow bunny: one on the orchids of Arizona and New Mexico and one on Florida.

This book is a must for anyone interested in our native orchids. It is, as well, a treasure to have on one's bookshelf.

Jim Bissell Receives Honorary Degree

James K. Bissell was given the Honorary Doctor of Humane Letters by the University of Akron on May 10, 2003. The citation follows:

The native flora of Northeast Ohio has a champion in James K. Bissell. The curator of botany and coordinator of natural areas for the Cleveland Museum of Natural History, Mr. Bissell has analyzed, catalogued, and protected the region's plant life for more than 30 years.

Under Mr. Bissell's leadership, the Museum's Natural Areas program expanded dramatically to include more than 3,000 acres of protected land in 26 different locations. He documents vascular plant distribution throughout northern Ohio, and is especially interested in areas that harbor significant biotic communities and rare species.

Mr. Bissell attended Miami University, received a bachelor's degree from The Ohio State University, and later earned a master's degree from the University of Wyoming. He joined the Cleveland Museum of Natural History in 1971, and today heads the Department of Botany. Mr. Bissell also serves on the President's Commission of the Nature Conservatory.

In addition to his work with the museum, Mr. Bissell is active in several community organizations. He is a member of the Upper Cuyahoga River Task Force, the Ohio Rare Plant Committee, and the Ohio Lake Erie Heritage Area Steering Committee, among other organizations.

In 2000, the EcoCity Cleveland Advisory board named Mr. Bissell a Bioregional Hero for Lifetime Achievement, recognizing his many years of work discovering the biological diversity of Northeast Ohio and establishing a system of nature preserves to protect the regions endangered habitats.

Mr. Bissell was honored with the 2001 Ohio Biological Survey Naturalist Award, the Northern Ohio Live Award of Excellence Honorable Mention in 1999, and the Award of Merit from the Cleveland Audubon Society in 1998.

Big Darby Creek, Ohio Back Home Again

Ann Zwinger (our Annual Dinner speaker on November 7, 2003)

When I settle into the canoe, curve my hand around the paddle shaft, and push off into the energetic spring flow of Big Darby Creek, I feel as if I've magically gone home again. Never mind that I grew up in Indiana, not Ohio, on the White River, not Big Darby Creek. What surrounds me is the imprinted landscape of my childhood where the air lies gentle as a feather cloak. Outlines and colors match, scents and sounds mesh, and the memories rush back of fireflies rising on a summer evening, the fair moonlight, the cloudscape that spawned Zeusian thunderstorms, picnics on the Fourth of July, and a small brown river at our doorstep, spinning purposefully downhill. It is early Monday morning, the first day of summer. A storm blew through at dawn and vaporous clouds mist the sun, leaving soft-edged shadows. Witchity witchity witchity, carols a northern yellowthroat, a warbler that prefers these thicketed water edges. I catch a glimpse of a yellow cravat and a rakish mask. He repeats his song, lecturing the interlopers, descanting upon insect availability and the virtues of green leaves.

The canoe floats out into a soft, silvery-green English watercolor landscape where light glosses a whole vocabulary of leaf shapes—ferny, feathery, and filmy, lobed, oval and lanceolate, palmate and notched, ruffled and toothed. The leaves cluster in bountiful bundles, overlaid layer on layer, all the kinds of greens Winsor & Newton manufactured for English watercolorists. Despite this halcyon aspect of a stream miles away from anywhere, Big Darby Creek runs through a well-settled area only twenty miles west of the state capital.

Big Darby Creek, only 78 miles in length, is a modest stream that wends southeast across southeastern Ohio. It meanders across fairly flat, glaciated land, draining 560 square miles, 80 percent of which is farmland. Its name comes from a Wyandot Indian chief with the unlikely name of Darby who lived on the creek when government surveyors came through in the eighteenth century.

Big Darby cossets its treasures: small clockwork creatures that wend their way through its bottom pebbles, freshwater mollusks that siphon and filter hidden within its gravels, small fish that dart like jewels among the stems of its waterweeds—beneath its quiet surface is one of the most valuable and healthy warm-water streams in the Midwest. It has little of the urban pollution that besets so many waterways and is unique in being relatively undammed. Big Darby has been spared a great deal of what has happened to many other Midwestern streams even though it retains only 10 percent of its original forests. Hydrographic communities in Ohio generally alternate between flood and dry, boom or bust, a regimen hard on fish because it strands them in small pools. Most streams have dams, and trees cut along the edges allow heavy siltation. Big Darby's substrate has remained relatively sandy and clean.

Big trees lean out over the water, address their reflections, replicate their colors. The leaf-fall litter from these trees is the base of the stream community's food chain. Vortices spin off the paddle stroke, gurgling miniature tornadoes into the slithering surface. When the breeze blows, red maple leaves flash silver as the underside of their leaves flips over, as quickly as a school of minnows turning. The wooded riparian corridor is critical, for the detritus that falls into the stream provides the food base for the dragonfly and caddis fly larvae that supply the food for the darter that provides the food for the gar.

After the glaciers withdrew 16,800 years ago, even though the ice had disappeared, the climate remained harsh and the ground wet, forming an Arctic tundra. Threads of meltwater trickled out from the retreating ice sheet, braided together, nibbled out a streambed, worried a channel through the glacial till and sometimes into the underlying limestone country rock. As the climate warmed and dried, spruce and fir filtered in. By 11,000 years ago pine trees invaded. Eight thousand years ago the climate had warmed enough to replace the trees with "peninsulas" of prairie vegetation. By 4,000 years ago a cooler, more humid climate again allowed trees to come in, and mixed forests darkened the Darby Plains that flanked Big Darby Creek.

The Darby Plains provided good hunting and shelter for Native Americans. In February 1751, Christopher Gist described the area as "full of beautiful natural meadows" rich with "turkeys, deer, elks and most sorts of game, particularly buffalos." Jonathan Alder, who was captured and raised as a Native American, thought it the "greatest and best hunting ground of the whole Indian territory." Indian trails webbed the landscape. European settlers moved in after the Treaty of Greenville in 1795, forcing out Native Americans by 1820. The settlers drained the meadows and changed the prairies to bluegrass pasture or plowed it under, land today productive with corn and soybeans.

Virtually all the land in Big Darby watershed is as domesticated as the family dog. Such a large drainage is owned by so many people and managed by so many agencies, it is impossible to sequester it as a unit under single management. The solution to preserving Big Darby Creek and its watershed is not in managing acreage per se (as often happens in the West where I live), but managing the watershed. Big Darby is in good health because twenty-five different agencies, under the leadership of The Nature Conservancy, have formed a complex partnership to keep it so.

This pleases me inordinately, because where I grew up the White River was rust-colored due to a wire mill upstream polluting the river. Nobody ever caught anything but carp. People accepted it. No one objected. Big Darby is

healthy because people *did* object to misuse and cared enough to make changes to preserve its health.

Leaning over the gunwale to check what's going on in the shallows I find myself watching some minute riffle beetles, hard to see because they're so small. Their extra-long claws enable them to anchor onto stones in riffles where the water is well aerated. They don't frequent streams with heavy sediment load, low oxygen content, or muddy bottoms, so their presence indicates good water conditions.

The salubriousness of Big Darby Creek is measured by the invertebrates that crawl and slither, burrow and hide, in the creek's glacial gravels and pebbles, a heritage that allows a multitude of interstices for these small feeders and snorkelers. Rather than using pure chemical analyses as a yardstick for measuring a stream's conditions, biologists now use the stream's inhabitants.

Scarves and sprinkles of foam vein the serene surface. The creek, flowing one to two miles per hour, is fast enough to oxygenate water for the rich assortment of mollusks that live here. Big Darby, with its forty species, has, for its size, by far the richest mollusk fauna in the Midwest. Freshwater bivalves developed in the New World, probably in the Mississippi drainage basin, for the best diversity of species occurs here. As often happens when a creature is sought and used over many generations, it garners colorful names, some of the printable ones being pig toe, washboard, elephant's ear, slop bucket, and spectacle case. These long-lived freshwater bivalves are neither mussels nor clams, although commonly called so because they resemble the familiar saltwater ones, but are "unionids," a separate family of bivalves restricted to fresh water. When I hold one of these unionids in my hand, it fills my palm, its paired shells heavy. Like clams, they have two shells hinged together, siphons, and a foot that anchors them in the substrate. They require good water, for heavy siltation clogs their breathing tubes. One species, the fat mucket, tolerates contamination, and when these occur in numbers, they indicate poor water. Big Darby's two endangered species, the northern club shell and northern riffle shell, are those that require the cleanest water.

The young of unionids, called glochidia, are parasitic and encyst upon fish gills or fins. By hitching a ride on wide-ranging fish, unionids eventually occupy a whole drainage. Dams that confine fish passage also localize unionids. Glochidia do not appreciably damage the fish, who build up an immunity toward the mollusks through time and as adults rarely carry the encysted freeloaders.

Unfortunately there's a large market for the shells, and poaching is prevalent. The shells are heavily in demand for buttons and ground up as pearl-starters—bits of shell rounded and inserted in a freshwater oyster shell to produce the irritation for pearl formation.

Drifting quietly downstream, I watch for a longnose gar, a primitive-looking fish with vertebrae that extend out into the tail. A hangout-and-wait hunter, its eyes set high for good vision, it lurks innocently in the shallows. When it sights a good meal it slams into the side of an unsuspecting

fish and impales it, one of the stream's top predators. Big Darby boasts eighty-six fish species in its seventy-eight miles, of which a dozen such species are rare or endangered. Since man's advent around 1750, most Ohio creeks have become silty and only host fish able to tolerate polluted water. Big Darby's unique fauna flourishes because it still has its clear water and clean substrate. Like the freshwater bivalves, the fish have delightfully descriptive names. Madtom may be so called because of the venomous spines in the fins which, if grasped, deliver a very nasty sting.

This morning the creek is muddy from big storms upstream and it's useless to try to see fish, yet I keep hoping to spot the bright slivers of color of Big Darby's darters. Members of the perch family, many are brilliantly hued. Tippecanoe darters (an endangered species) are brilliant yellow-orange, dorsal fin a screaming red, a color scheme that soberes to black when two males confront each other, as does the coloration of the variegated darter. The blackening appears and disappears quickly, and seems to pair with aggressive defense of territory. Banded darters are teal blue with a golden yellow iris around a big black eye. Darters' coloring is on their flanks, so that a predator, like a green heron or kingfisher, looking down into the water, simply sees a thin gray line that blends in with the background.

The redhorses, genus *Moxostoma*, are very sensitive to water quality, and Big Darby Creek is one of the few places the silver redhorse lives. The common name may have come from the broad back configuration of the fish and their coloring. The five redhorse species here, all of which need clean water, are specialized insectivores. The black redhorse is a very intolerant species and abundant in Big Darby, as is the shorthead redhorse. All find shelter in the stream's underwater meadows of water willow and arrowweed.

As important as what's here is what's not here. The usual trash fish are uncommon. Common carp and flathead catfish are introduced species that do not do well in high-quality streams. Big Darby's are caught only in limited areas of logjams and backwaters. Nor are there colonies of bloodworms or fat muckets.

At the edge of the creek a tiny fluttery blue butterfly samples the mud at river's edge beneath a piece of Big Darby "slump prairie." Above it, flowers confetti the steep slope with color, lavender and yellow and white, plants typical of Midwestern prairies. Prairies are few and far between in Ohio now, and some exist in odd places and flaunt the concept that prairies are flat. This four-acre patch hangs on the steepest imaginable riverbank. It grows on the outside bend of a meander where the current speeds up and undercuts the banks which, being fairly loose glacial till, "slump" into the river. Slumpage leaves a bare patch in which prairie plants, unable to grow in the shade of deciduous woods, successfully invade. If unstable enough, the slope remains open and inhospitable to shrubs and trees, but here some have already rooted and, as they shade the undergrowth, prairie plants will eventually disappear until another slump bares another patch of bank.

A prairie indicator, purple coneflower, blooms generously across the bank. The bristle tips of the disk flowers on the tall cone are an intense orange, almost iridescent, a glorious, startling juxtaposition against the drooping lavender petals. Purple coneflower was once widely used as a medicinal plant for all kinds of ills from snakebite to toothaches, burns to colds. Even today in Germany there are over two hundred preparations made from these plants, some valued for their cortisone-like activity.

Partridge pea is one of the first pioneers to come in on bare ground and to stabilize it. Small lavender thimbles of gayfeathers are perfectly named. A little white spurge that looks more like a white forget-me-not manages to dispense a meager and diagnostic drop of white sap out of a broken leaf vein. Whorled rosinweed, so-called because of its resinous sap, and black-eyed Susan, are opportunistic, also able to root on these unstable slopes before trees are large enough to shade them out.

The canoe brushes under the overhanging branches of a black walnut and they unload their inhabitants on me. A daddy longlegs parades my sleeve, countershaded brown on top, silvery beneath, long lunar-module legs that reach out and tap-tap feel, tap-tap pause. I watch it pace around my wrist, up my sleeve, a creature I remember watching as a child, searching its future with its second pair of legs.

The next day I explore Big Darby Creek on foot, enjoying its well-treed banks and fringe of meadows, frittering away the day in wandering and watching, luxuriating in Midwestern summertime. In the middle of the path lies a fifteen-inch snake, the diameter of my index finger, tan stripes on brown patterned with darker brown triangles, all dark head, inquisitive little face. Its bright red-orange tongue, split and tipped with black, samples the air and an alien presence.

To someone used to sparser western landscapes, Big Darby's meadows are happily lush. The combination is perfect: enough familiar plants to feel at home, enough new ones to pique my interest. Flowers I never knew what to call as a child are in bloom here, and as an adult I relish the pleasure of knowing their names. Yellow moneywort weaves through the base of grasses and herbs, waxy five-petaled yellow flowers the size of a quarter named, I assume, because they look like gold coins scattered in the grass. White avens is in flower and seed, its seedhead a ball armed with stiff crochet-hooked pistils that latch onto my shirt. A little cinnabar winged moth, dragging its landing gear, feeds on the flowers. In among the head-high plants I stoop to look at a patch of corn salad, to me a new plant, an odd, weak-stemmed low herb with small entire and opposite leaves, finely white-haired, its minute, tubelike flower with a fringed lip.

Dock dangles green seeds, not yet turned mahogany. Garlic mustard in seed tilts up linear two-inch pods. Also called Jack-by-the-hedge and sauce-alone, it's one of the weedier mustards. Wild rose has yet to bloom, while red

clover has heads as big as golf balls. Mullein, Queen Anne's lace, sweet cicely are all plants of damper ground. A matted place reveals where a deer bedded down. Timothy, fescue, and ryegrass grow as high as my shoulder.

As I approach the river, thimbleweed, an anemone, blooms in drifts in partial shade, the ecotome between open meadow and streamside trees. Its white flowers light up the shadows. The spectacular fire pink, brilliant red, with starlike flowers and extra fringe at its throat is also part of the assemblage. Each sticky red star is a Betelgeuse come to earth. For the first time in my life I find teasel in bloom, having hitherto known it only from its familiar seedhead. The tiny lavender flowers form a narrow ring, proceeding downward on the thimble. The seedheads are still unsurpassed for raising the nap on cloth, the fineness of their spines producing an elegant surface. Ruellias bloom with big lavender flowers two inches across. Wild parsnip looks like yellow Queen Anne's lace. Blue-eyed grass raises little six-petaled blue faces from small irislike leaves.

To reach river's edge I negotiate a thicket of grass higher than my head, webbed with grapevines that grab and snatch, so dense I can't see my feet. Multitudes of tiny caddis flies waft up out of the grass and as quickly settle, the adults of the larvae that live in Big Darby Creek. Caddis-fly larvae, along with riffle bugs, are among the least pollution-tolerant creatures. Caddis-fly larvae fashion tiny cylinders of pebbles or twigs or shells, each species with its own architectural style. They need highly oxygenated water circulating through the tubes where they spend the preponderance of their lives.

At water's edge I watch the flat current of Big Darby spin by at my feet. The creek's sound is modest, demure, like a cat lapping milk. White violets flower in the thick shade and a lovely big patch of jewelweed comes into bloom. The tangerine-colored flowers hang hidden beneath leaves jeweled with drops of water. A proven folk remedy, both the crushed leaves and the juicy sap ease poison ivy rash. Some people freeze the pulverized leaves in ice cubes and rub them on the itchy areas.

A hackberry tree stands in water up to its ankles. Its finely toothed leaves are beset by pinhead galls. I count eighty-three on one leaf, about as many as a three-inch leaf can hold. The galls are made by psyllid flies that look like very tiny cicadas, less than an eighth-inch long. Females lay eggs on the trees that hatch into larvae in the fall and overwinter in the bark. They emerge as the new leaves appear in the spring, ready to attack the leaves, impeccably timed to the tree's cycle of life.

I find a boulder in dappled shade on which to sit and write. Beside me the creek garbles and gushes over a willow limb arched out into the water. The currents saunter and swirl, swizzle and ruffle. Blue-black damselflies skate through the air, fluttery-and skittish. A white dot at the wing tip makes a distracting flashing during flight. Another damselfly, its protruding eyes giving it a hammerhead shark aspect, alights on a jewelweed leaf. The puzzlement is: with all these damselflies, where are the dragonflies? An

ecologist suggests that the high, fast water has discouraged the usual dragonfly hatch and that the nymphs have taken cover in the interstices of the gravels in the stream until the flow quiets, whereas damselfly larvae are more likely to be cosseted in vegetation roots and so less likely to be buffeted by the high water on emergence.

A small shiny black fly alights on my page and explores my thumb as I write. The buzzing of summer's cicadas vibrates the air. A huge yellow and black bumblebee drones from one white clover blossom to another, faithfully pollinating, one by one. A mourning dove bemoans its lost loves. I could sit here for hours, listening, watching, pondering, relishing.

In this speckled shade Big Darby Creek anneals past and present, alerts me to a landscape heritage that ballasts my life. Here on this quiet summer morning, the first day of summer, Big Darby weaves together a lifetime, a then and a now. I feel as if I have rounded out a childhood, canoed the stream I never got to canoe as a child, filled in some of the blanks, interwoven past and present and future. I have visited with the scenes of my childhood, brought my adult knowledge to focus as I could not do then, tied up some frayed and raveled ends of memory, pleased by this

summer stream that is cared for as the one of my childhood was not. Big Darby Creek speaks in the accents of my native land, running water with a Midwestern accent.

A filamentous spider silk tighropes between two grass stems. It billows and gleams in the soft air currents. This busy, ticking, little world that surrounds me says Big Darby is a good place to siphon if you're a northern riffle shell, a good place to warble if you're a yellowthroat, a good place to flow if you're a creek, a good place to swim if you're a redhorse, and a good place to breathe if you're a human.

Thomas Wolfe was wrong.

Ann Zwinger, who lives in Colorado Springs, is the author of a dozen nature books, among them *Beyond the Aspen Grove*, *Land Above the Trees*, *The Mysterious Lands*, and *Run, River, Run*, for which she received the 1976 Burroughs Medal.

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Book Reviews: E. Lucy Braun

Deciduous Forests of Eastern North America: E. Lucy Braun, Ph.D. Trade paperback. NJ: Blackburn Press, 596 pages, ISBN 1-930665-30-x, \$69.95. 596 pgs. with foldout, map in the rear.

One of the Bibles of Ohio's botanical literature has just been released, once again. First published in 1950 and still widely used as a reference today, Braun's book describes in detail the trees and shrubs of the deciduous forests of Kentucky, Ohio, Pennsylvania, Tennessee, Virginia and West Virginia. The author was a pivotal influence in the then-developing field of plant ecology and is one of the most beloved botanists in the history of Ohio's botany. The Ecological Society of America elected Braun its first woman president in 1950. The book has long been out of print and could be found on the Internet only for prices in the \$500 range, if at all. The Blackburn Press is a new publishing house, founded with the mission of keeping in print and available for reasonable prices scientific books that are classics in their field.

E. Lucy Braun (1889-1971); Ohio's Foremost Woman Botanist: Her Studies of Prairies and their Phyto-geographical Relationships. Ronald L. Stuckey. ISBN 0-9668034-4-2 2001 Available from R.L. Stuckey, RLS Creations, PO Box 12455, Columbus Ohio 43212-0455. \$15.00 includes shipping. 262 pages, hardbound

This book is a treasure, containing memories of Braun by Charlie King, Ed Voss, Lucile Durrell and others, all icons of Ohio botany themselves. Her Journal Papers on Prairies in unglaciated south central Ohio are reproduced

here and the book concludes with descriptions of the Adam County preserves that Braun supported. The phyto-geographics of Ohio botany is a fascinating subject and one too long neglected. Anyone who has not journeyed to the prairies of Adams County has missed a great treat. From summer through fall the area is alive with color, not only from the plants, but also from the butterflies that populate the area. The book contains maps of how to get to each preserve as well as detailed trail maps and descriptions of the points of interest. Dr. Stuckey will release this summer a book similar to this one concerning Dr. Jane Forsyth and her papers in this field, and we will tell you about it in the September issue of the Journal.

Web Sites of Interest

Gallery of Illinois Plants. Lists of Families, Species, Common Names, and Non-native plants. Each plant has several photographs, distribution map, and other pertinent data.

http://www.inhs.uiuc.edu/cwe/illinois_plants/

Brooklyn Botanical Garden on garlic mustard. Great pesto recipe requiring lots of leaves and roots.

http://www.bbg.org/gar2/topics/kitchen/2002fa_garlicmustard.html

Flora of North America. Names, taxonomic relationships, continent-wide distributions, and morphological characteristics of all plants native and naturalized found in North America north of Mexico.

<http://hua.huh.harvard.edu/FNA/>

Adams Lake Prairie State Nature Preserve

Origin of the Prairie

By Guy L. Denny

When we think of prairies most of us usually envision vast expanses of grasslands extending from horizon to horizon. Yet to the ecologist, the term "prairie" does not designate a setting as much as it does a specific assemblage of plants dominated by grasses. It is this floristic composition, not size, which determines whether a plant community is labeled as a prairie. And so it is with the prairies of Ohio. All are merely small remnants of what once were probably relatively large expanses of open prairie. Scientists place the origin of Ohio's prairies 4,000 to 6,000 years ago at a time when our climate was drier and warmer than present. Harsh climatic conditions then favored the eastwardly expansion of drought-resistant prairie grasses. Consequently, fingers of western prairie were able to penetrate deeply into the eastern woodlands.

Eventually the rains and cooler summers returned, thus enabling trees, to become re-established on the soils which had previously been too dry for their seedlings to compete with the grasses. In some places where active erosion, shallow dry soils or prolonged seasonal flooding prevented the tree seedlings from getting a foothold, prairie continued to flourish. By the time the first Europeans settled the Ohio wilderness, only these remnants of original prairie were here.

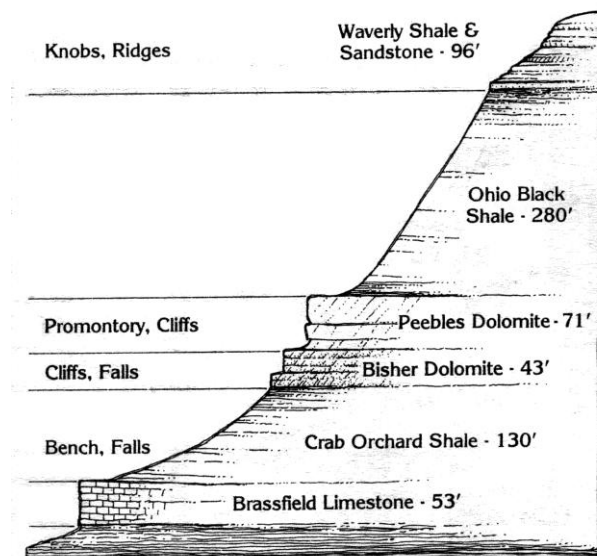
Most of the prairies of glaciated northern and central Ohio tend to be dominated by tallgrasses, primarily big bluestem, Indian grass, and prairie cord grass. In sharp contrast are the xeric, or dry, prairies of Adams County, which tend to occur on much shallower soils than their northern counterparts and which are more often dominated by short prairie grasses, mainly little bluestem, side-oats grama, and triple-awn grass. This difference in site occurrence as well as the unusual botanical composition is primarily why many ecologists subscribe to Dr. E. Lucy Braun's position that the prairies of Adams County are much older than those to the north which developed upon Wisconsinan glacial till. Braun, one of the world's foremost ecologists, spent much of her life studying the vegetation of Adams County. She believed that these prairie communities are remnants of an earlier prairie invasion from the west during some earlier interglacial stage, perhaps even before Illinoian glaciation.

Today, the prairies of Adams County have been reduced to small patches situated on rocky promontories and eroded hillsides. Here, on these dry, shallow soils, trees probably never were able to become established. During presettlement times the prairies may have existed only as islands of vegetation surrounded by dense woodlands. Later, as the forest was cleared for farming, these small prairie refuges served as seed sources. As adjacent marginal farmland was

abandoned, crops were gradually replaced by red cedar trees and prairie vegetation. Adams Lake Prairie appears to have originated in this way. Once forest cover was removed, the rather unstable soils here eroded rapidly making farming on this slope impractical. Judging from the age of the red cedars growing in this opening, the land was finally abandoned sometime around the 1920s. It was apparently then that prairie became well established on the barren soil left behind.

Geological Setting

Although the north side of Adams Lake was covered by the Illinoian Glacier more than 125,000 years ago, the glacier did not advance beyond the broad preglacial river valley which was later dammed to form Adams Lake. Therefore, Adams Lake Prairie and all the land to the south has never been glaciated; consequently, all these soils are of bedrock origin rather than glacially deposited. Adams Lake Prairie is underlain by calcareous Crab Orchard Shale (Alger formations of Lower Silurian Age). This shale was derived from mud and silts deposited at the bottom of an ancient sea more than 455 million years ago. Crab Orchard shale is rarely seen at the surface since the newly exposed layers quickly disintegrate into buff-colored mud containing scattered chips of dolomite. When dry the mud is hard, but it quickly becomes sticky and is prone to accelerated erosion when wet.



Once the original forest was cleared from these slopes, the relatively shallow woodland soils soon lost their fertility and became severely eroded with deep gullies. The farmers then

simply moved onto new land and left the abandoned fields to the invading junipers and prairie grasses.

Notice how the oak-hickory forest has reclaimed much of this former hillside field during the last 60 to 70 years, yet the deep scars of erosion remain clearly visible. Also notice that within the prairie opening the gullies are still actively being eroded and consequently the trees have not been able to gain a strong foothold to shade out the prairie plants—plants which require bare soil and lots of sunlight. However, if the gradual encroachment of the woodlands on the prairie is not held in check, this prairie-juniper community will ultimately be replaced by a forest community dominated by oak and hickory trees.

Adams Lake State Park

During the fall of 1947, the gates to the dam across Lick Branch of Ohio Brush Creek were first closed, and Adams Lake was created. Funds for purchasing this 47-acre impoundment were provided by the Ohio Division of Wildlife under a cooperative agreement with the town of West Union. In 1950 the lake and surrounding recreational land was officially designated as a state park to be operated by the newly created Ohio Division of Parks. Today, Adams Lake provides the water supply for West Union as well as good fishing for park visitors.

Adams Lake Prairie

In the mid 1830s, Assistant State Geologist Dr. John Locke was commissioned by the state legislature to make a geological survey of Adams County. In his journal, while describing what he called the great marl stratum (Crab Orchard Shale) which occurs in the vicinity of West Union, he stated that "When it is left in conical mound-like outliers, the marl is often almost barren of trees, and produces some peculiar prairie-like plants, as the prairie docks, wild sunflowers, scabish (blazing star), rudbeckias, etc. These places are called 'bald hills' and 'buffalo beats.' Several occur within a mile of West Union, in a northerly direction, and would be quite a paradise for the botanist." It is probably from these "bald hills," which for the most part have since been destroyed, that the prairie plants at Adams Lake Prairie got their start. And as Locke noted even back in 1838, such areas are indeed quite a paradise for the botanist.

The prairies of Adams County are markedly different from their northern tallgrass counterparts in glaciated Ohio. They occur on thin, calcareous soils derived from dolomites and limestone bedrock. Vegetation is comparatively sparse and made up primarily of shortgrasses, prairie wildflowers, and red cedars.

Adams Lake Prairie is still subject to much active erosion; consequently this prairie community is different from many

of the other more stabilized xeric prairies throughout the county. The amount of ground cover here is directly proportional to the degree of erosion. The most highly eroded gullies are essentially barren of vegetation. Note, on the other hand, the amount of vegetation growing around the bases of what few trees have been able to get a foothold in the prairie. Notice how the soil-holding capability of roots has created small "islands" of earth 1 to 2 feet higher than the surrounding eroded surface of the prairie.

A plant which seems to thrive best on the eroded surfaces of this prairie is prairie dock. In fact, this is one of the most impressive stands of prairie dock in the state. By the first week of August this opening will be accented by a striking assemblage of golden prairie dock flowers perched atop stout stems which may grow to a height of 6 feet. Notice how rough the large arrowhead-shaped leaves are. Not only may this sandpaper-like covering protect this plant from grazing animals, but it also minimizes the amount of valuable moisture which might evaporate through the surface of the leaves.

Some of the other wildflowers which share this otherwise barren surface of the prairie with prairie dock include nodding wild onion, pale-spike lobelia, flowering spurge, golden alexanders, and long-leaved bluets. On the less eroded sections grow little bluestem, shooting-star, prairie rose, downy wood-mint, Sampson's snakeroot, rose-pink, stiff gentian, three-lobed violet, and green milkweed.

The most common shrub is the St. John's-wort whose showy yellow flowers decorate the prairie by late June. Its abundance is matched only by the juniper or red cedar. Junipers seem to thrive on limey or bare dry hillsides. Growth of cedars is very slow because of the thin soils. Trees that are less than 2 feet dbh (diameter at breast height) are often about 50 years old. The very fragrant, pinkish red heartwood is used for making cedar chests, pencils, fence posts, and cedar chips. The seedlings and young twigs have needle-like leaves while the branches of mature trees are covered with tiny, overlapping, scale-like leaves.

In addition to red cedar, a few other trees have been able to establish themselves in Adams Lake Prairie including shingle oak, post oak, white oak, sassafras, black locust, flowering dogwood, and redbud. As their roots secure the soil and their crowns shade the earth, they will set the stage for more forest species to invade the prairie community and eventually displace it. As you walk along the Post Oak Trail from the prairie to the adjacent woods, notice the transition of vegetation which takes place and keep in mind that at one time, where the forest grows today, this was bare hillside like the existing prairie opening. The deep gullies, now stabilized by forest vegetation, are the only evidence of the former prairie opening.

The wooded portion of this mature preserve is dominated by white oak with an understory dominated primarily by flowering dogwood and redbud. Co-dominant trees include red oak, black oak, shagbark hickory, and pignut hickory, all indicators of well-drained soil.

Preserve History

In 1971, Professor Richard H. Durrell, a faculty member at the University of Cincinnati and a member of the newly created Ohio Natural Areas Council, reported the occurrence of an excellent xeric prairie adjacent to Adams Lake State Park. This site had previously been brought to his attention by his close friend and renowned botanist-ecologist, Dr. E. Lucy Braun. This small prairie was visited frequently by Braun and was one of the better prairies of its kind in Adams County.

After an extensive investigation of the site by ODNR staff and based upon the recommendations of the Natural Areas Council, the Department of Natural Resources purchased 22.37 acres of prairie and surrounding oak-hickory forest in 1972.

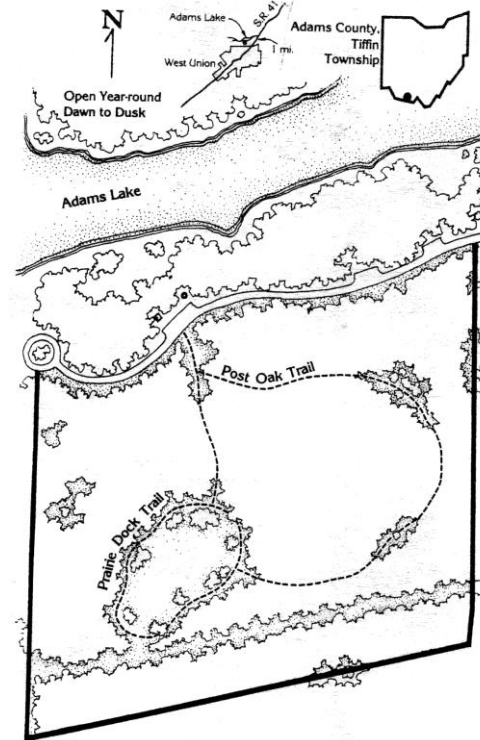
May 16, 1973, Adams Lake Prairie was officially dedicated as an interpretive state nature preserve, part of a statewide system of nature preserves established in 1970 to ensure protection of Ohio's vanishing natural heritage. Preserves protect such natural features as bogs, marshes, forests, fens, prairies, geological formations, endangered species habitats, and the plants and animals that live in these unique areas.

The following is a partial list of the plants of Adams Lake Prairie State Nature Preserve:

Wildflowers:

- Agrimony *Agrimonia* sp.
- Alumroot *Heuchera americana*
- American Columbo *Swertia caroliniensis*
- American Ipecac *Gillenia stipulacea*
- *Black-eyed Susan *Rudbeckia serotina*
- Blue-eyed Grass *Sisyrinchium angustifolium*
- Blue Vervain *Verbena hastata*
- Bottle-brush Grass *Hystrix patula*
- Bowerman's-root *Gillenia trifoliata*
- *Butterfly-weed *Asclepias tuberosa*
- Canada Goldenrod *Solidago canadensis*
- Common Cinquefoil *Potentilla simplex*
- Cranefly Orchid *Tipularia discolor*
- Cut-leaf Toothwort *Dentaria laciniata*
- *Cylindric Blazing-star *Liatris cylindracea*
- Daisy Fleabane *Erigeron annuus*
- Downy Skullcap *Scutellaria incana*
- Downy Wood-mint *Blephilia ciliata*
- Early Meadow-rue *Thalictrum dioicum*
- *False Aloe *Agave virginica*

MAP OF ADAMS LAKE STATE NATURE PRESERVE



- Fawn Lily *Erythronium albidum*
- Featherfleece *Stenanthium gramineum*
- *Flowering Spurge *Euphorbia corollata*
- Fragrant Bedstraw *Galium triflorum*
- Gail-of-the-earth *Prenanthes alba*
- *Golden Alexanders *Zizia aurea*
- Golden Ragwort *Senecio aureus*
- Goldenrod *Solidago* spp.
- Greek Valerian *Polemonium reptans villosum*
- Greenbrier *Smilax rotundifolia*
- *Green Milkweed *Asclepias viridiflora*
- Heal-all, Selfheal *Prunella vulgaris*
- Heath Aster *Aster ericoides*
- *Hoary Puccoon *Lithospermum canescens*
- Indian Hemp *Apocynum cannabinum*
- Indian-tobacco *Lobelia inflata*
- Jerusalem Artichoke *Helianthus tuberosus*
- King Devil *Hieracium pratense*
- Large flowered Bellwort *Uvularia grandiflora*
- *Lavender Bergamot *Monarda fistulosa*
- *Little Bluestem *Andropogon scoparius*
- Long-leaved Bluets *Houstonia longifolia*
- Long-spurred Violet *Viola rostrata*
- Madder *Galium mollugo*
- May-apple *Podophyllum peltatum*
- *Narrow-leaved Mountain Mint *Pycnanthemum tenuifolium*

- *New England Aster *Aster novae-angliae*
- *Nodding Wild Onion *Allium cernuum*
- Ox-eye Daisy *Chrysanthemum leucanthemum*
- Pale Indian-plantain *Cacalia atripicifolia*
- *Pale-spike Lobelia *Lobelia spicata*
- Palmate Violet *Viola palmata*
- Panic Grass *Panicum depauperatum*
- *Partridge-pea *Cassia fasciculata*
- Pennyroyal *Hedeoma pulegioides*
- Perfoliate Bellwort *Uvularia perfoliata*
- Phlox *Phlox divaricata*
- Poison Ivy *Rhus radicans*
- *Prairie Coneflower *Ratibida pinnata*
- *Prairie Dock *Silphium terebinthinaceum*
- *Prairie Rose *Rosa setigera*
- Prostrate Tick-trefoil *Desmodium rotundifolium*
- Purple Foxglove *Agalinis purpurea*
- Roman Ragweed *Ambrosia artemisiifolia*
- *Rose-pink *Sabatia angulans*
- *Rough Blazing-star *Liatris aspera*
- Rue-anemone *Anemonella thalictroides*
- Sampson's Snakeroot *Psoralea psoraloides*
- *Shooting-star *Dodecatheon meadia*
- Slender Bush-clover *Lespedeza virginica*
- Slender Ladies'-tresses *Spiranthes gracilis*
- *Spider Milkweed *Asclepias viridis*
- *Stargrass *Hypoxis hirsuta*
- *Stiff Gentian *Gentiana quinquefolia*
- Stonecrop *Sedum ternatum*
- Thimbleweed *Anemone virginiana*
- Three-lobed Violet *Viola triloba*
- Tick-trefoil *Desmodium paniculatum*
- True Solomon's Seal *Polygonatum biflorum*
- Twin-leaf *Jeffersonia diphylla*
- Violet Wood Sorrel *Oxalis violacea*
- Virginia Creeper *Parthenocissus quinquefolia*
- White Blue-eyed Grass *Sisyrinchium albidum*
- White Snakeroot *Eupatorium rugosum*
- White Sweet Clover *Melilotus alba*
- White Wild Licorice *Calium circaezans*
- Whorled Loosestrife *Lysimachia quadrifolia*
- *Whorled Rosinweed *Silphium trifoliatum*
- Wild Carrot *Daucus carota*
- Wild Geranium *Geranium maculatum*
- Wild Grape *Vitis sp.*
- Woodland Sunflower *Helianthus divaricatus*
- Wood Sorrel *Oxalis sp.*
- Yarrow *Achillea millefolium*
- Yellow Flax *Linum virginianum*
- Yellow Sweet Clover *Melilotus officinalis*

*Typical prairie species

Shrubs and Trees:

- Black Cherry *Prunus serotina*
- Blackhaw *Viburnum prunifolium*
- *Blackjack Oak *Quercus marilandica*
- Black Locust *Robinia pseudo-acacia*
- Black Oak *Quercus velutina*
- Black Walnut *Juglans nigra*
- Blue Ash *Fraxinus quadrangulata*
- *Carolina Buckthorn *Rhamnus caroliniana*
- Flowering Dogwood *Cornus florida*
- Kingnut Hickory *Carya laciniosa*
- Pignut Hickory *Carya glabra*
- *Post Oak *Quercus stellata*
- Prickly Ash *Xanthoxylum americanum*
- Redbud *Cercis canadensis*
- *Red Cedar *Juniperus virginiana*
- Red Mulberry *Morus rubra*
- Red Oak *Quercus rubra*
- Sassafras *Sassafras albidum*
- Shagbark Hickory *Carya ovata*
- *Shingle Oak *Quercus imbricaria*
- *Shrubby St. John's-wort *Hypericum prolificum*
- Slippery Elm *Ulmus rubra*
- Smooth Sumac *Rhus glabra*
- Southern Arrowwood *Viburnum dentatum*
- Sugar Maple *Acer saccharum*
- White Ash *Fraxinus americana*
- White Oak *Quercus alba*

*Typical prairie species

Reprinted from "Adams Lake Prairie State Nature Preserve," by Guy L. Denny. 1985. Published by the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Columbus, Ohio

Council on Invasive Species

On March 26th, 2003, the second session of the Invasive Plants working committee met in Columbus to study ways and means of helping Ohioans recognize and deal with invasives and exotics that are a threat to our environment. At the end of the day-long session it was unanimously voted to establish a Council on Invasive Species. This Council would continue to work with all interested parties such as parks, universities, Dept. of Transportation, Natural Areas and Preserves, Natural History Museums, Nature Conservancy, Dept. of Wildlife, Nature Centers, Arboretums, etc. The Council consists of representatives from all over the state that are interested in protecting our natural world from the invasives. We welcome input from concerned citizens. Suggestions may be forwarded to the Columbus office of The Nature Conservancy, care of Marleen Kromer, 6375 Riverside Dr., Suite 150, Dublin OH 43017.

Botany 101 – eleventh in a series

Internal Anatomy of Plants: Roots

by Dr. Rebecca Dolan and Dr. Katherine Schmid

Roots are mostly composed of the same cells and tissues that we introduced for shoots, but with a few specializations for their role in absorbing water and minerals. Again, growth in root length is due to an **apical meristem**, which produces cells that divide and develop into epidermis, ground, or vascular tissue depending on where they are located. Primary tissues of the root are arranged in this order: epidermis on the outside, then ground tissue, and then vascular tissue in a cylinder at the core of the root.

The root apical meristem is at the root tip. In longitudinal section, the apical meristem can be seen to be protected by a **root cap** of cells that are constantly sloughed off and replaced from within, as the root grows through the soil. Root cap cells exude a slimy material to help the roots grow past rough soil particles. The root cap is also the location of gravity-sensitive starch grains that trigger hormones to induce cell elongation such that the root grows with gravity, that is, down into the soil.

Above the meristem, an emphasis on cell division gives way to a zone in which cell expansion and elongation is emphasized. Still farther from the meristem, cells mature and take on their normal functions. Only in this zone of maturation do epidermal cells have the extensions known as **root hairs**; fully mature regions beyond this zone have lost their root hairs. The root hairs make the zone of maturation the most active in water and mineral uptake. Since only newly mature epidermis has root hairs, roots must constantly grow in order to keep up their absorptive capacity. That is one reason why pot-bound plants and street trees don't grow well.

Two cell layers found in young roots are absent from most stems. The vascular cylinder is bounded by an **endodermis**, a layer with precisely located deposits of a waxy substance called **suberin**. Strips of suberin prohibit water and minerals from getting into the vascular cylinder between cells. Instead, they must at minimum go through the selective membranes of the endodermis. Recall that xylem cells are dead and

cannot themselves choose appropriate materials for transport. The endodermis ensures that only properly selected substances are available to the xylem. In older roots that serve more as pipelines than as absorptive surfaces, the endodermis cell walls may become entirely suberized. The suberin may then serve to keep water in the vascular cylinder

Just inside the endodermis is the **pericycle**, which gives rise to branch roots.

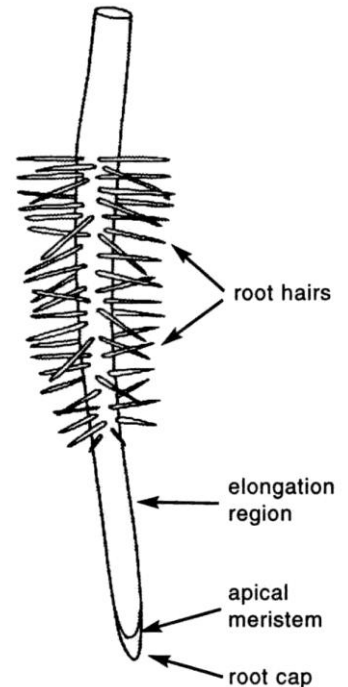
Usually branching begins when the root is very young. The branch, or lateral, roots must puncture the endodermis, ground tissue and epidermis before reaching the soil. This pattern of branching is very different from that of stems. Stem branches develop from lateral buds at the stem surface. Lateral buds, like leaves, are produced by the shoot apical meristem.

In woody plants, roots as well as stems use vascular cambium to produce wood (secondary xylem) and inner bark (secondary phloem), and cork cambium to produce outer bark (cork). This process does not begin until the section of root in question has lost its root hairs and ceased to be absorptive.

Becky Dolan is Director of the Friesner Herbarium at Butler University.

Dr Katherine Schmid is Associate Professor of Biological Sciences at Butler Her specialty is plant physiology.

Illustration by Jan Glimn Lacy, botanical illustrator, from her book Botany Illustrated.



Invasive Plants of Ohio

White and Yellow Sweet-clover *Melilotus alba*, *M. officinalis***DESCRIPTION:**

Both white and yellow sweet-clover are erect, herbaceous, non-native biennials that are members of the pea family. In their first year of growth, the plants are small with a smooth multi-branched stem. The leaves are alternate and divided into 3 finely toothed leaflets. The second year of growth is characterized by rapid growth of the root system and an overall bushy appearance with the plant reaching 3-5 feet tall by May. From May to September, flowers are produced on the second year plants. Flowers are borne on irregular spikes on the ends of elongated stems. Each flower spike will bear 40-80 flowers. The flowers are either white or yellow, the most obvious difference between these two species. Seed is set in summer with up to 350,000 seeds per plant.

HABITAT:

White and yellow sweet-clovers grow in open, disturbed areas such as roadsides, old fields, and utility easements. Intolerant of shade, sweet-clover invades upland habitats such as prairies, savannas, dunes, alvars, and meadows. They seem to grow best in, but are not limited to, calcareous soil. The roots of sweet-clover fix nitrogen in the soil, allowing the plants to live in nutrient poor areas.

DISTRIBUTION:

White and yellow sweet-clover are native to the Mediterranean region, central Europe, and Asia. They were brought to the United States in the 1600s as a

forage crop for livestock and for honey production. They are now found in all states and are used as a soil builder because of their nitrogen fixing capability. They are also often planted as wildlife cover. Both sweet-clovers are found throughout Ohio especially near agricultural regions.

PROBLEM:

The seeds of white and yellow sweet-clover have been shown to be viable for over 30 years. The plants are drought resistant and winter hardy. Because of their large

size in the second year of growth, they tend to overtop and shade native sun-loving species. They tend to be problematic in recovering prairies and savannas where they out-compete native species for water and nutrients.

CONTROL:

Mechanical: Prescribed burning in 2 or more consecutive years has been effective in reducing populations of white and yellow sweet-clover.

However, burning in only one year tends to increase populations. In small areas, hand pulling of first year plants when roots are small is also quite effective. **Chemical:** Spraying with systemic herbicides such as Roundup® or Glyphol® can be effective. Care must be taken to prevent over-spray to non-target species. **Biological:** The native sweet-clover weevil can help control white and yellow sweet-clover if the weevil is present in high concentrations. Unfortunately, this is not a reliable form of control.

Additional Information Sources:

- Eckardt, N. 1987. Element Stewardship Abstract for White and Yellow Sweet-clover. The Nature Conservancy.
- Turkington, R.A., P.B. Cavers, and E. Rempel. 1978. The Biology of Canadian Weeds: *Melilotus alba* Desr. and *M. officinalis* (L.) Lam. Canadian Journal of Plant Science 58: 523-537.

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FOR MORE INFORMATION:

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(614) 265-6453 www.dnr.state.oh.us/odnr/dnap/dnap.html

Reprinted from Fact Sheet 16, Invasive Plants of Ohio, Ohio Division of Natural Resources, May 2000



Yellow sweet clover



White sweet clover

Jennings Woods: A Natural Study Area

by Jason Hopkins

Introduction

Jennings Woods is a property of about 70 acres, located in Portage county about two miles northeast of Ravenna, that has been owned and preserved as a natural study area by Kent State University since 1969 (Herrick 1970). Though it has long been known to teachers and nature lovers for its wildflowers and relatively unspoiled natural beauty, no comprehensive floral survey or vegetative mapping had previously been done.

Jennings Woods is so-named because it belonged to a Mr. & Mrs. Ralph Jennings. Although he is said to have operated a saw mill on the property until the 1960's (J. Arthur Herrick, pers. comm.), Mr. Jennings evidently never clear-cut the forest, and little sign of the old mill is presently visible. Through the involvement of Dr. J. Arthur Herrick, professor emeritus of KSU, the widow Mrs. Jennings arranged the sale of the property to KSU in 1969.

The property is accessible (with permission of KSU) from McCormick Rd. near Ravenna. A utility right-of-way intersects the road, and continues back through most of the western half of it. The West Branch of the Mahoning River flows from north to south, basically along the eastern boundary. The eastern half of the property is essentially river valley/riparian floodplain, bordered by steep ridges. The western half is a mixture of upland and swamp forest.

At the southwest corner atop the western ridge sits the old Jennings house, and behind that is an agricultural field. The north border is influenced by an even larger right-of-way that runs behind it in an east-northeast direction. The river flows onto the property from the north at the east side. Atop the precipitous eastern ridge sits a house with yards behind it. The south border is formed by McCormick Rd.

Northeast Ohio lies within the glaciated eastern deciduous forest. Approximately the northern third of Portage county lies within an area dominated by beech-maple forest on the Wisconsin till plain, the southern two-thirds an area of mixed mesophytic forest on a thin layer of till over sandstone bedrock (Forsyth 1970). Jennings Woods is near the boundary between these two areas, and seems to contain elements of both. It has been said to contain "a swamp forest, an upland oak forest, a Buttonbush swamp and old sugar bush" (Herrick 1970).

Andreas (1980) identified eight major habitats occurring in northeast Ohio: 1. mesic woodlands (including Beech-Maple and mixed mesophytic); 2. dry woodlands (e.g. Oak-Hickory); 3. Hemlock woodlands and ravines; 4. swamp-floodplain woodlands; 5. ponds, lakes, and streams (aquatic); 6. marshes and Buttonbush swamps; 7. *Sphagnum* bogs and fens; and 8. prairie-like areas. Six of these eight are present or have elements present at Jennings Woods; absent are Hemlock woodlands and ravines and prairies.

Mesic Woodlands

This category is composed of the Beech-Maple and mixed-mesophytic assemblages. There is no doubt that it is well-represented at Jennings, for large areas are dominated by Beech. This type of forest covers areas that are not wetland, floodplain, or steep slope. Maple and Hickory are also prominent in some of these areas. Plants well-represented in these areas at Jennings include Dwarf Ginseng, Northern Lady Fern, Wood Ferns, Christmas Fern, Maidenhair Fern, Solomon's Seal, Canada Mayflower, Solomon's Plume, Tall Rattlesnake-root, Partridgeberry, Mayapple, and the Halberd Violet, among others.

Dry Woodlands

Dry woodlands include the well-known oak-hickory and (formerly) oak-chestnut formations. Shagbark hickory is common, and stands of mature oak occur on the physiologically dry steep inclines. Whether this constitutes a dry woodland or Oak-Hickory formation remains to be seen, but at least some of the characteristic vegetation is present. This formation is probably not extensive enough at Jennings to produce a differentiated understory.

Swamp-Floodplain Woodlands

Sycamore is probably the signature species of this formation. As mentioned previously, the eastern half of Jennings Woods is primarily floodplain, and Sycamore is common. The floodplain is the best place to view an array of showy spring ephemerals. Prominent species include Trilliums, Violets, Bluebells, Leeks, Onions, Hairy Woodmint, Basil Balm, Cut-leaved Coneflower, Foamflower, Mitrewort, Wild Stonecrop, Ditch-Stonecrop, Turtleheads, Skunk Cabbage, Green Dragon, Spring Beauty, Purple Cress, and too many others to mention.

Variations of the swamp-forest formation probably occur off of the floodplain as well, for the topography is rather terrace-like, with areas of fairly flat forest bordered by steep ridges. Also, the soil does not appear to drain well in many places. Much of the forest above the floodplain collects water, even giving rise to *Sphagnum* hummocks. It is unclear whether these seasonally wet areas or vernal pools of the forest are extensive and persistent enough to cause differentiation of the canopy vegetation; however, the Marsh-Marigold and the Swamp Buttercup do occur there.

Interestingly, such characteristic swamp-forest species as Willow and Green Ash are found near the (elevated) road or roadbanks at the south end of the property.

Ponds, Lakes, and Streams

While there are neither lakes nor permanent ponds at Jennings, West Branch River qualifies as an aquatic habitat. The river tends to be shallow and rocky through most of the property, and there is not a large aquatic flora. However, at

least one oxbow and one slough-like formation are present, in which grow some aquatic and emergent species (Illinois Pondweed, Common Waterweed, Smartweeds). The slough is connected to the stream, and so does not appear to normally dry out; the oxbow was observed to dry out this past summer, but not enough to kill the Duckweed that normally floats on top of the water.

Several places within the right-of-way that crosses the land tend to collect water, and thus constitute vernal or ephemeral pools. Though not persistent, they produce some aquatic vegetation, such as Water-Plantain, as well as providing (evidently fertile) breeding grounds for amphibians.

Marshes and Buttonbush Swamps

There is one small buttonbush swamp area in the northwest corner of the property, but it seems like a relict one, more of a stand really. Apparently the larger portion of the swamp was destroyed by the right-of-way in back of the property. Besides Buttonbush, plants known to occur here include Water-Horehound, Virginia Bugleweed, Marsh St. John's Wort (threatened in Ohio [Ohio DNAP, 2002]), *Bidens* spp., and Sourgum tree.

The open area caused by the right-of-way that crosses the land has both wet and dry areas. The wetter areas form small but well-developed marshes, which have been observed to produce an impressive display of wildflowers. These areas were colonized by mostly native species, and are strikingly free of weeds. Species include Bonaset, Joe-Pye-weed, Ironweed, Monkeyflower, Great Lobelia, Maddog Skullcap, Seedbox, Dodder, Clammy Hedge-Hyssop, and various grasses, sedges, Asters, and Goldenrods. Also noteworthy (mentioned here for lack of a better place) is a small population of the Closed Gentian (*Gentiana clausa*). This species was until recently classified as "potentially threatened", but has been delisted in the most recent revision (Ohio DNAP, 2000, 2002).

Sphagnum Bogs and Fens

These areas are defined by the presence of *Sphagnum*, whether alkaline or acidic. *Sphagnum* occurs at several locations at Jennings Woods, forming hummocks in wet woods as previously mentioned. The best '*Sphagnum* bog' in the classic sense could be considered the other half of the buttonbush swamp. Though existing side by side, these two areas are strikingly dissimilar floristically, with one side dominated by buttonbush and the other by *Sphagnum*. In a detailed study of three northeast Ohio bogs, including two in Portage county, Andreas (1990) found that the most commonly occurring plants were *Vaccinium corymbosum*, *Decodon verticillatus*, *Chamaedaphne calculata*, *Gaylussacia baccata*, *Nemopanthus mucronatus*, *Carex canescens*, and *Hypericum virginicum* (= *Triadenum virginicum*). Of this list, the Highbush Blueberry and Marsh St. John's Wort (*Triadenum tubulosum*) are known to occur. Also common here are Sour-gum and Cucumber-root.

Slightly disjunct from the buttonbush swamp is a larger wooded swamp area. Though strictly speaking this area should probably fall under the "swamp-floodplain woodlands" category, it seems more like a wooded wetland than a wet woodland. Wetland species are present, but *Sphagnum* is not. Dominants include Wild Calla (threatened in Ohio [Ohio DNAP, 2002]), Highbush Blueberry, and Cinnamon Fern. As mentioned previously, some of the scattered woodland vernal pools or swampy areas are characterized by *Sphagnum* hummocks.

It is thus seen that Jennings Woods is a diverse natural area, with several rare species. Herrick's (1970) statement that "it is rich with many species due to the varied habitats" has been shown to be correct, with almost 300 native species documented. The flora will be further documented and analyzed with a handheld GPS unit, purchased with a grant generously awarded by the Northeast Ohio chapter of the Native Plant Society.

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Author's note:

The rare plants I found at Jennings are, in order rarest to least rare, are as follows:

- 1) *Carex cephaloidea*, endangered in Ohio;
- 2) *Triadenum tubulosum*, threatened in Ohio;
- 3) *Calla palustris*, threatened in Ohio; and
- 4) *Gentiana clausa*, which was just de-listed and was considered potentially threatened in Ohio prior to that.

Summer Program Schedule

June 14, Sat.: LAKE KELSO BY CANOE! Glacial Lake Kelso harbors many varieties of bog loving plants including several varieties of ferns, shrubs and herbaceous plants growing in zones around the lake. Directions: Take St Rt. 44 south of St Rt. 87 approximately 1 mile to Burton Heights Blvd. Turn left (east) and continue until crossing over Hotchkiss Road. Parking area for Burton Wetlands State Nature Preserve is on the left. Registration limited. To register call Judy Barnhart at (W) (440) 564-9151 (W) or (440) 286-9516 (H). **Lake Kelso 10:00 am**

Jul. 19, Sat.: JENNINGS WOODS. Jason Hopkins, winner of the 2002 NPS grant for his work in the surveying of this property will lead a trip to the 100 acre area in Portage county, known for its wildflowers and relatively unspoiled natural beauty. It has an impressive show of late-blooming marsh and field species including sphagnum-blueberry swamps, and riparian species along the course of the river and floodplain areas. Meet at the old K-Mart building (now Gabriel Brothers) on the east edge of Kent on Main Street (Rt. 59) **Jennings Woods 9:00 am**

The following is a list of native species by common name that were collected by Jason Hopkins between June 20th and July 20th of last year; they are thus likely to be seen flowering or fertile on the scheduled July 17th field trip.

Alder-leaved Buckthorn	Common Enchanter's-Nightshade	Illinois Pondweed	Silky Dogwood
American Beech	Daisy Fleabane	Indian-Hemp	Sour-gum
Arrow Tear-thumb	Deer's-tongue Grass	Leafy Bulrush	Southern Water-Plantain
Basil Balm	Elderberry	Monkey-flower	Spotted St. John's Wort
Black Chokeberry	Field Horsetail	New York Fern	Swamp Candles
Black-eyed Susan	Floating Manna Grass	Northern Lady Fern	Swamp Milkweed
Blue Vervain	Forest Sunflower	Orange Jewelweed	Swamp Rose
Blunt Broom Sedge	Fowl Manna Grass	Partridge Berry	Two-edge Sedge
Bottlebrush Grass	Foxglove Beard-tongue	Path Rush	Water-hemlock
Bristly Greenbriar	Fringed Loosestrife	Prairie Brome	White Vervain
Buttonbush	Great Bulrush	Purple Milkwort	Wild Calla
Common Agrimony	Hairy Woodmint	Scouring-rush	Wild Leek
Common Blackberry	Heal-all	Seedbox	Wood-nettle
	Hedge Bindweed		Wool-grass

Aug 10, Sun.: NEWEST PARK SITE IN PORTAGE/SUMMIT COUNTIES. Stanley Stine, City of Twinsburg Naturalist, will show us this choice spot BEFORE it is opened to the public. Meet at the North corner of the intersection of Cannon and Liberty Roads. Twinsburg Park & Nature Preserve is approximately 1400 acres in one of the finest wetland woods in Ohio. We will have the opportunity to see a soon to be metro park area being developed as a partnership between Portage and Summit Counties. Expect to see pawpaw thickets and the endangered *Carex arctata*. Call Stanley Stine 330-963-8704 with questions. Reservations not necessary. **Twinsburg 9:30 am**

Sep 6, Sat.: LEARN ABOUT THE PRAIRIES OF OHIO. A one-hour workshop will cover historical plant communities and distribution maps, beautiful color slides-- narration by Bob Kehres from Ohio Prairie Nursery. A field trip to the Ohio Prairie Nursery Hiram site will follow the lecture. From downtown Cleveland, Go south on I-77 to I-480 east. Exit at Rt.422 toward Solon, follow Rt. 422 to the traffic light at St. Rt. 700. Turn right on Route 700 and continue for about 5 miles into Hiram. Turn left on Rt. 305 to Wheeler. Turn right at the entrance to the field station. **Hiram Field Station 9:00 am**

Sept 21, Sun.: LATE SUMMER BOTANIZING THE BEACHES OF ASHTABULA COUNTY Bob Bartolotta of the Cleveland Museum of Natural History will lead this trip being done in conjunction with the Ohio Lake Erie Commission "Coastweeks." Sea-rocket, Seaside-spurge, Beach-grass, Beach-pea and Cocklebur are just a few of the unusual plants growing on the beaches of Ashtabula County. Stops will include Conneaut Park Bathing Beach in Conneaut, Walnut Beach in Ashtabula and Geneva State Park in Geneva-on-the-Lake. Bring lunch, beverages and snacks, and plan on spending the entire day along the shoreline of Lake Erie in Ashtabula County. Call Jean Roche to register and receive a map to meeting spot. **Ashtabula, Conneaut 9:00 am – ? pm**

Report on Spring Programs

By Jean Roche

A long-awaited and very welcome SPRING! brought dozens of enthusiastic members to the first two NPS spring programs. On both dates we could not have had better weather and those members who made the decision to join us were delighted by their choice.

In March, Jane Rogers of the Akron Garden Club presented "Woodland Wildflowers of Ohio- Their Conservation and Propagation" to a group of almost 50 people. The site, The West Woods Nature Center recently opened by the Geauga County Park System, was a beautiful setting for her talk. Jane is co-chair of a group founded by the Akron Garden Club to rescue wildflowers from areas where planned construction might otherwise destroy them. Her slides, some of which were taken during actual rescue work, were both explanatory and beautiful.

Jane shared her expertise in wildflower cultivation and propagation and was emcee to a lively question and answer period after her talk. Slides of her own backyard gave evidence as to her talent.

On April 26, Judy Barnhart arranged for NPS members to visit Parkman Gorge, the headwaters of the Grand River. The hike was hosted by Ann Ungard who did a phenomenal job of guiding us to more wildflowers than one could imagine. The combination of cold spring and quick warm-up period provided an amazing and sometimes surprising display. Bloodroot and golden ragwort were blooming along side white and red trillium (including a cream and a mauve variation of the latter). Common blue violets and spring beauty were a carpet leading to the wooded area. Wild phlox, wild geranium, wild ginger, and wild oats bloomed along with the toothworts, false mermaid, and blue cohosh. No less than 40 species were noted—it was a wonderful treat for the 18-20 hikers who thoroughly enjoyed fording rivers, hiking the ridges and following the gorgeous lowland trails.

Be sure to check this journal for our next exciting trips to Cottonwood Hollow and Lake Kelso. Remember that some trips require registration so call early!

Reprise. Ohio Gets a State Wildflower

By Tom Cooperrider

With the year 2003 marking the bicentennial of Ohio's statehood, our newspapers and other media have carried accounts of many interesting events in Ohio history. Here is one of our own.

Guy Denny, then Assistant Chief of the ODNR's Division of Natural Areas and Preserves, reported the event in the DNAP Newsletter of April – May 1988. The Large White Trillium, Guy wrote, "is one of the most abundant and showy spring wildflowers in Ohio. Although the scarlet carnation is the designated state flower of Ohio, the Large White Trillium became Ohio's official state wildflower ... with the passage of H.B. 763, sponsored by Rep. Robert Clark (R-Chardon). This bill was introduced at the urging of the Ohio Native Plant Society and its founding president and member of the Ohio Natural Areas Council, Ann Malmquist."

In the March 1984 issue of *On The Fringe*, the "President's Column" included this note, "Barb Andreas has suggested that we petition the State Legislature to change the Ohio state flower from red carnation to a suitable native wildflower such as the Trillium. I would like to hear from you on this..."

In the May 1984 issue: "It has been decided that we not attempt to replace the Carnation as the State Flower, but instead will propose the Trillium as an additional and native flower to represent Ohio. We will seek the advice of the Ohio Department of Natural Resources and various lobbyists in Columbus before we proceed." By July, the goal has become more specific. The Society would propose "TRILLIUM GRANDIFLORUM as the State Wildflower."

Eighteen months later, the November/December 1985 issue reported great progress. "Representative Clark, Member of the House Natural Resources Committee in Columbus, is sponsoring the bill to name *Trillium grandiflorum* as the State

Wildflower." This species was chosen because it is widespread in Ohio, because it is "readily recognizable by the general populace, and because it is not a rare species which might be threatened by bringing it to notice."

In January 1986, news was reported that, HOUSE BILL 763 has been introduced into the General Assembly by Rep. R. W. Clark, 74th District. It is as follows: To enact Section 5.021 of the Revised Code to adopt the White Trillium as the state wildflower."

Society members were urged to: "Pick up your pens and write!" The rationale outlined above would provide "salient points" for letter writers, along with the observation that Ohio was one of only three states in the Union whose state flower was not a native species. They were cautioned to include a reminder that: "We are **not** advocating replacement of the red carnation as the state flower, but rather the adoption of the Trillium as the state **wildflower**."

The bill, passed later that year by both houses of the State Legislature, was signed into law by Gov. Richard Celeste at 1:32 PM on Dec. 4, 1986, with an effective date of March 5, 1987.

From the "Editor's Column" of January, 1987: "At the Annual Lecture, Representative Bob Clark of Geauga County presented us with the Trillium Bill that Governor Celeste signed into law the day before. Barb Andreas proposed this project in September of 1983. The wheels of government grind very slowly. But now our Trillium grandiflorum has official status beside the red carnation as an Ohio flower." The Act read simply, "Sec. 5.021. THE PLANT TRILLIUM GRANDIFLORUM, COMMONLY KNOWN AS THE LARGE WHITE TRILLIUM, FOUND IN EVERY OHIO COUNTY, IS HEREBY ADOPTED AS THE STATE WILD FLOWER."



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On The Fringe

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