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Eleanor Thompson contemplating big bluestem on the Alderville Savannah at the Annual General Meeting in September.
Photo: Sarah Mainguy

FIELD BOTANISTS of ONTARIO

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Standard source for scientific names and authorities of vascular plants:

Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray and M.J. Oldham. 1998. *Ontario Plant List*. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, Ontario. Forest Research Information Paper No. 123, 550 pp. + appendices

President's Message

The New Year implies change, and that goes for the Field Botanists' executive as well. The publication of this double issue (with Mary Ann Johnson's help) marks the end of Leslie Collins' tenure as Newsletter Editor: she is stepping down to focus on her dream of teaching overseas in 2007. Thanks for many years of excellent editorial work, Leslie. Many thanks also go to Dirk Janas, our Past President and Nick Hodges, our Trip Coordinator, for jobs well done. They will be stepping down to follow their respective dreams in 2007. We welcome the new executive. Sarah Mainguy

Editor's Corner

This looks like a great issue of the FBO newsletter. I can't take all the credit for editing this issue. Mary Ann Johnson, our Past President, worked hard over the holidays to pull this issue together. So a big thank you to Mary Ann for a job well done. I'll do my best to match the editing expertise of Leslie and Mary Ann. Sarah Piett

Feature

A key to the common grasses of southern Ontario by vegetative characteristics.

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Grasses are important components of most terrestrial ecosystems around the world. Whether as community dominants, rare plants, agricultural weeds, invasive alien species of natural and semi-natural habitats, remediation vegetation, or agricultural crops, grasses are among the most important ecological and economic plants in the landscape.

Many grasses can be identified by their vegetative characteristics alone. This is useful in field studies where distinguishing species at various growth stages and conditions is important. The current key is presented to help in identifying grasses of Ontario in their vegetative state. Several identification tools have been published for Canadian grasses, including Nowosad et al. (1942), Clarke, et al. (1944) and Best et al. (1971). The publication on western grasses by Best et al. (1971) is still available as a web-based document (see references for URL).

The present key attempts to rely on characteristics observable in the field with a good hand-lens. Characteristics which are more easily used and more reliable tend to be given first in the couplets. Microscope examination of leaf blade tissues will reveal many additional characteristics useful for identification (e.g., Clifford and Watson 1977), but this is beyond the scope of this key. Grasses included in this key are primarily common introduced and native species which are often present as important components of plant communities in southern Ontario. The decision to include or exclude any particular species is, however, rather subjective. In some cases the key leads to groups which cannot be reliably identified to the species level using vegetative characteristics utilized in this key. The species contained in these groups are indicated in Table 1.

Authorities of scientific names, English common names and some common synonyms are given in Table 1. The taxonomy follows that used by the Flora of North America project. A short glossary of terms is provided and a series of illustrations is included to assist in the interpretation of character states. The drawings are taken from Best et al. (1971) and Aiken and Darbyshire (1983).

A few words of caution

Material must be examined carefully as not only are many characteristics inconspicuous, but growing conditions as well as disease and predation can influence the expression or condition of character states. Leaf auricles and the joining of leaf sheath margins (sheath closure) are particularly susceptible to physical damage or deterioration with age. Selecting parts that are mature but not senescent will give the best results. Examining more than one leaf or plant (if available) will also be helpful. This is **not** a key to grass seedlings. Plants should have at least 3 leaves and preferably more.

The key certainly has many deficiencies partly because of various constraints. Some couplets in the key will work better than others, but all should work better with increasing user experience. Many ambiguities will, however, continue to bedevil both creators and users of such keys. The author welcomes any comments or suggestions aimed at improvement.

Glossary of terms

abaxial: The surface or portion of a structure facing away from the main axis of the plant part from which it arises. For leaf blades this is usually the "back" or "underside" of the leaf and is often darker in colour.
adaxial: The surface or portion of a structure facing toward from the main axis of the plant part from which it arises. For leaf blades this is usually the "top" or "upperside" of the leaf and is often lighter in colour.
auricle: A small expansion of the leaf at the top of the sheath and the edge of the collar (but not always present). They may be poorly developed and several leaves should be examined. See Fig. 5.
blade: The upper (distal) portion of the leaf (above the ligule) that does not clasp the stem. They may be flat, folded or rolled. See Figs. 1, 2 & 4.
ciliate: Having a line of hairs in one plane; usually along a margin.
cleistogenes: Small cleistogamous flowers present singly or in small groups within the leaf sheaths at the base of the stem. These are hidden and revealed only when the sheath is removed from the stem.
collar: The back (abaxial) side of the leaf at the junction of the blade and sheath. See Fig. 1.
conduplicate: Folded inwardly along the central longitudinal axis so that the adaxial surfaces on either side are facing each other. Like a piece of paper folded in half. See Fig. 2A.
convolute: Laterally rolled with the margins overlapping and each leaf completely surrounding and/or surrounded by the next one. Like a piece of paper rolled. See Fig. 2B.
decumbent: With the lower (basal) part of the stem lying more or less prostrate and the distal end erect, or curved upwards from the base.
distichous: Arranged in two (opposite) ranks along the axis.
emarginated: With a shallow notch or indentation.
entire: An uninterrupted, smooth margin (without teeth, lobes or other projections).
glabrous: Without hairs.
glaucous: With a whitish (or bluish-white) cast, as if frosted; usually because of a thin microscopic deposit of wax.
internode: The region of a stem between two nodes.
inflated: Swollen or enlarged; and then loose in the case of leaf sheaths.

involute: The edges in-rolled towards the centre.
keel (keeled): A conspicuously raised portion (usually a vein) along the edge of a fold or curve. As in the keel of a boat.
ligule: A structure on the inside (adaxial side) of the leaf at the junction of the sheath and the blade; it may consist of a ring of hairs, a short membrane topped with hairs or a thin (usually translucent) membrane. See Figs. 5 & 6.
membranous: Thin, pliable, like a membrane (see ligule).
recumbent: Lying down, prostrate, flat on the ground.
rhizome: An underground stem giving rise to roots and other stems. See Fig. 1.
scabrous: Bearing minute prickle hairs and usually rough to the touch.
sheath: The lower (proximal) part of the leaf which forms a clasping (sometimes loosely) tube around the stem (at least when young). See Figs. 1 & 3.
stolon: An aerial stem which grows more or less horizontal to the ground and giving rise to roots and other stems at the nodes. See Fig. 1.
truncate: An end (proximal or distal) that is in a straight plane perpendicular to the main axis. Cut off straight.
vernation: The arrangement and shape of leaves when young, prior to unfolding from the bud-shoot. See Fig. 2.

A key to the common grasses of southern Ontario by vegetative characteristics.

1. Vernation of leaf blades folded (conduplicate) in the bud-shoot (Fig. 2A)..... **2**
1. Vernation of leaf blades rolled (convolute) in the bud-shoot (Fig. 2B) **15**

2. Auricles present; basal sheaths reddish at base; leaves glabrous..... ***Lolium perenne***
2. Auricles absent; sheaths various; glabrous or pubescent **3**

3. Ligules a fringe of hairs (Fig. 5E, 6D); tuft of long hairs at margins of collars (Fig. 5E); old blades strongly curved or curled; sheaths with long hairs (sometimes glabrous); plant tufted
..... ***Danthonia spicata***
3. Ligules membranous; no long hairs at margins of collars; old blades not strongly curved or curled; sheaths glabrous or densely pubescent **4**

4. Blades conduplicate and bristle-like or sometimes flat, prominently ridged on the adaxial surface **5**
4. Blades folded or flat and not bristle-like, not prominently ridged on the adaxial surface **6**

5. Ligules less than 0.5 mm long or obsolete; sheaths open (Fig. 3B); leaves glaucous or blue-green; plant in dense tufts, without creeping rhizomes
..... ***Festuca*** species
5. Ligules about 0.5 mm long; sheaths closed nearly to top; leaves green or dark green; plant in loose tufts, usually with creeping rhizomes ..... ***Festuca rubra***

6. Medial lines absent on the adaxial blade surface; tip of blades taper-pointed (the young basal blades may be slightly boat-shaped) (Fig. 4A) **7**
6. Median lines present on the adaxial surface (two light coloured lines running along either side of the mid-vein); tip of blades boat-shaped (Fig. 4B) **8**

7. Ligules 4 to 10 mm long, white coloured or transparent, apex without minute ciliate hairs; basal sheaths glabrous, strongly compressed (flattened) and keeled; basal blades glabrous; rhizomes absent
..... ***Dactylis glomerata***
7. Ligules 0.5 to 2 (2.5) mm long, yellowish or brownish coloured, apex minutely ciliate; basal sheaths usually pubescent (at least sparsely), weakly compressed; basal blades often pubescent with long hairs; short rhizomes usually present
..... ***Schizachyrium scoparium***

8. Ligules truncate, less than 1 mm long; rhizomes present **9**
8. Ligules obtuse or acute, more than 1 mm long; rhizomes present or not **10**

9. Sheaths keeled; ligules usually about 1 mm long, emarginate (sometimes obscurely); blades short (2 to 10 cm), broadest at base, gradually tapering to the apex; foliage blue-green, often glaucous; minute hairs on margins of collars absent; plant not in tufts and without basal tufts of leaves ***Poa compressa***
9. Sheaths not keeled; ligules usually about 0.5 mm long, entire; blades long (5 to 30 cm), parallel-sided (not evenly tapering); foliage deep-green, not glaucous; minute hairs often present on margins of collars; plant in loose tufts with a small basal tuft of leaves
..... ***Poa pratensis***

10. Rhizomes present; sheaths closed to near the top (Fig. 3C), with distinct cross-veins joining the main veins **11**
10. Rhizomes absent; sheaths open with the margins overlapping (Fig. 3B), without evident cross-veins **13**

11. Blades 3 to 5 mm wide; sheaths not keeled
..... ***Glyceria striata***
11. Blades 6 to 15 mm wide; sheaths keeled **12**

12. Sheaths smooth, not minutely roughened; foliage yellow-green to bright green, not glossy dark green; stem bases usually less than 1 cm wide
..... ***Glyceria grandis***
12. Sheaths usually minutely roughened (feel with lips or tongue); foliage bright green or glossy dark green (best assessed in a fresh condition); stem bases often 1 cm or more wide ..... ***Glyceria maxima***

13. Blades not tapering (parallel-sided) to the abruptly pointed and boat-shaped tip, often puckered or wrinkled in places; sheaths smooth; plants annual
..... ***Poa annua***
13. Blades truncate at base and tapering to a narrow boat-shaped tip, not puckered or wrinkled; sheaths usually scabrous; plants perennial **14**

14. Blades glossy on abaxial surface; sheaths minutely roughened; stems weak and usually strongly decumbent ..... ***Poa trivialis***
14. Blades not glossy on the abaxial surface; sheaths smooth ; stems stiff and erect or only slightly decumbent ..... ***Poa palustris***

15. Auricles present (sometimes rudimentary or deciduous) (See Figs. 5A-C). Note that claw-like auricles are not always well developed on all leaves and are often deciduous; several fresh leaves in good condition should be examined . **16**
15. Auricles absent or rudimentary (Figs. 5C-D) **25**

16. Plants of beaches and sand dunes (unstable sands) **and** long rhizomes present; leaves usually glaucous; blades strongly ribbed on adaxial surface . ***Leymus mollis***

16. Either plants not of beaches and sand dunes or long rhizomes absent; plants glaucous or not; blades strongly ribbed on adaxial surface or not **17**

17. Blades glossy on the abaxial surface; ligules usually entire, sometimes lacerate (Fig. 6C), but not ciliate; auricles rounded to claw-like (sometimes rudimentary) **18**

17. Blades not glossy on the abaxial surface; ligules ciliate or lacerate; auricles claw-like (sometimes rudimentary) **20**

18. Plants annual; blades smooth on the margins near the base; ligules usually 1 mm long or more ..... ***Lolium multiflorum***

18. Plants perennial; blades scabrous on the margins (sometimes obscured by involute blade margins); ligules usually 0.5 mm long or less **19**

19. Auricles ciliate (sometimes sparsely) ..... ***Schedonorus arundinaceus***

19. Auricles glabrous ..... ***Schedonorus pratensis***

20. Blades somewhat stiff, bluish green or glaucous, narrow and flat or rolled **21**

20. Blades stiff or lax, usually green or bright green, broad and flat (if somewhat glaucous and rolled then blades 8 to 15 mm wide) **22**

21. Auricles usually small or rudimentary but sometimes well-formed and claw-like (sometimes absent), often only one; blades and sheaths glabrous or pubescent ***Elymus trachycaulus***

21. Auricles small and fragile, in pairs; blades and sheaths pubescent (at least the lower ones) ..... ***Hordeum jubatum***

22. Blades usually at least sparsely pubescent on the abaxial surface, 2 to 10 mm wide; sheaths, especially the basal ones, with short hairs; collars glabrous or pubescent **23**

22. Blades glabrous, 8 to 18 mm wide; sheaths glabrous (except sometimes on margins); collars glabrous **24**

23. Long creeping rhizomes present; collars minutely pubescent; blades with midrib not pronounced on the abaxial surface of blades and not prominently ridged on the adaxial surface, 3 to 10 mm wide; ligules 1 mm long or less ***Elymus repens***

23. Rhizomes absent; collars glabrous; blades with midrib conspicuous on the abaxial surface and prominently ridged on the adaxial surface, 2 to 6 mm wide; ligules 0.5 to 1.5 mm long ..... ***Agropyron pectiniforme***

24. Margins of sheaths ciliate; blades almost smooth on the abaxial surface; ligules about 1 mm long ***Elymus canadensis***

24. Margins of sheaths glabrous or scabrous, rarely ciliate; blades scabrous on both surfaces; ligules about 0.5 mm long ..... ***Elymus virginicus***

25. Ligules absent; sheaths compressed, keeled; plants glabrous; plants annual ..... ***Echinochloa*** species

25. Ligules present, although sometimes very short; sheaths usually round or compressed; plants pubescent or glabrous; plants annual or perennial **26**

26. Nodes swollen when fresh and collapsed when dry, densely pubescent with downward pointing hairs; plants rhizomatous **27**

26. Nodes not swollen when fresh, glabrous or inconspicuously puberulent; plants rhizomatous or not **28**

27. Margins of leaf blades harshly scabrous, cutting to the touch; sheaths harshly scabrous, the basal ones glabrous; rhizomes long (up to several dm), usually without imbricate scaly leaves ..... ***Leersia oryzoides***

27. Margins of leaf blades smooth or lightly scabrous (not harsh or cutting to the touch); sheaths not harshly scabrous, the basal ones usually sparsely pubescent sometimes glabrous (examine several leaves); rhizomes short (up to several cm), with imbricate scaly leaves ..... ***Leersia virginica***

28. Ligules a fringe of hairs, sometimes a short membrane fringed with longer hairs (Figs. 5 E and 6D, above) **29**

28. Ligules membranous (sometimes very short), sometimes indistinctly puberulent-ciliate with hairs much shorter than membrane (Figs. 5A-D, 6A-C and 6D, below) **44**

29. Blades glabrous or slightly pubescent (usually long hairs) near base on the adaxial surface **30**

29. Blades pubescent on the adaxial surface and usually on both surfaces (sometimes sparsely on one or other surface) **40**

30. Plants perennial **31**

30. Plants annual **36**

31. Plants without rhizomes **32**

31. Plants with long creeping rhizomes **34**

32. Basal leaves short, somewhat ovate and stiff, forming a rosette; ligules a loose or dense ring of hairs with at least some hairs 3 to 5 mm long; plants with short blades usually less than 5 cm long ***Dichanthelium acuminatum***

32. Basal leaves long, lax and similar to the stem leaves, not forming a rosette; ligules a dense ring of hairs up to 2 mm long; plants with large blades usually 10 to 40 cm long **33**

33. Plants loosely tufts, without a dense tuft of basal leaves; basal sheaths without scattered hairs; sheath margins and collars pubescent with long hairs ..... ***Sporobolus cryptandrus***

33. Plants densely tufted, with leaves in a dense basal tuft; basal sheaths usually with scattered hairs; sheath margins and collars mostly glabrous ..... ***Sporobolus heterolepis***

34. Basal leaves with blades much shorter than sheaths (sometimes minute); basal sheaths usually not overlapping (nodes usually exposed), blades acute, to 30 mm wide, usually flat ..... ***Phragmites australis***

34. Basal leaves with blades about as long as to longer than sheaths; basal sheaths usually strongly overlapping (nodes rarely exposed); blades long acuminate, to 15 mm wide, usually rolled or involute (sometimes flat) **35**

35. Stems 3 to 10 mm in diameter basally, erect and rarely branched; blades 5 to 15 mm wide, involute or flat; ligules 1 to 3 mm long ..... ***Spartina pectinata***

35. Stems 1 to 2 mm in diameter basally, usually decumbent or procumbent and branched; blades 1 to 4 mm wide, mostly involute; ligules 0.5 to 1 mm long ..... ***Spartina patens***

36. Sheaths often conspicuously inflated, margins usually not over-lapping; cliestogenes usually present in basal sheaths (plants often appearing vegetative); lower margins of blades often with scattered glands and/or long hairs with pustulate bases (usually varying on different leaves of the same plant) ..... ***Sporobolus*** species

36. Sheaths not or scarcely inflated, margins usually over-lapping; cleistogenes absent; lower margins of blades without glands or scattered long hairs with pustulate bases **37**

37. Margins of the collars (auricle position) with a conspicuous tuft of long hairs (see Fig. 5E); blades 1 to 2 mm wide; the margins usually involute ..... ***Eragrostis pectinacea***

37. Margins of the collars glabrous or hairs not in a tuft; blades usually wider than 2 mm; the margins usually not involute **38**

38. Stems usually not erect from the base (recumbent, decumbent or somewhat trailing), zigzagging at the nodes; basal part of sheaths often reddish ..... ***Panicum dichotomiflorum***

38. Stems erect from the base, straight and not zigzagging; basal part of sheaths usually green **39**

39. Margins of sheaths glabrous; blades sparsely pubescent at base on the adaxial surface, the hairs long, twisted and flexuous; collars glabrous ..... ***Setaria pumila***

39. Margins of sheaths pubescent; blades glabrous; base of collars fringed with hairs ..... ***Setaria viridis***

40. Margins of the blades with small raised glands which have a central depression and appear somewhat crater-like, often glands are also present on the sheaths, especially the mid-vein (the glands are small requiring magnification to see properly and may be hidden when the margins are involute); blades and sheaths usually with scattered long hairs (some leaves may be glabrous) **41**

40. Margins of the blades and the sheaths without small raised glands (sometimes long hairs have swollen bases); hairs on blades and/or sheaths dense **42**

41. Blades 2 to 8 mm wide; sheaths usually with scattered glands (especially near top); reputed to have a disagreeable odour (not always detectable) ..... ***Eragrostis cilianensis***

41. Blades 1 to 4 mm wide; sheaths usually without glands or with glands only on the mid-vein ..... ***Eragrostis minor***

42. Blades with long hairs only on the adaxial surface; sheaths pubescent on the distal margins, elsewhere glabrous ..... ***Setaria faberi***

42. Blades with long hairs on both surfaces (sometimes glabrous); sheaths glabrous or pubescent **43**

43. Ligules 0.5 to 1.5 mm long; young sheaths usually reddish ..... ***Panicum capillare***

43. Ligules 1 to 3 mm long; young sheaths usually greenish ..... ***Panicum miliaceum***

44. Sheaths closed to near the top (Fig. 3C) **45**

44. Sheaths open (margins usually overlapping) at least half way (Fig. 3A, B) **49**

45. Sheath margins hyaline, joined to top and continuous with ligule margins which are joined in front forming a tube around the stem. Initially there is simply a longitudinal strip of hyaline tissue at the front of the sheath where the margins would normally be. The tissue is very delicate and easily splits with age, often with a few oblique transverse fibres temporarily remaining before complete separation ..... ***Schizachne purpurascens***

45. Sheath margins hyaline or not, not joined to the top and continuous with ligule margins to form a tube **46**

46. Long creeping rhizomes present; sheaths and blades mostly glabrous (western genotypes usually at least partly pubescent) ..... ***Bromus inermis***

46. Rhizomes absent; sheaths and blades pubescent **47**

47. Plants perennial; ligules 0.5 to 1 mm long, truncate ..... ***Bromus ciliatus***

47. Plants annual; ligules 1 to 5 mm long, acute **48**

48. Basal part of sheaths reddish (sometimes the whole plant with a reddish colour), hairs on sheaths straight and retrorse; ligule 1 to 5 mm long ... ***Bromus tectorum***

48. Basal part of sheaths green, hairs on sheaths usually somewhat wavy and spreading or retrorse; ligule 1 to 2 mm long ..... ***Bromus japonicus***

49. Rhizomes usually shallow and with hardened, closely imbricate scaly bracts; plants perennial **50**

49. Rhizomes present or absent, but if present without hardened, closely imbricate scaly bracts; plants annual or perennial **51**

50. Ligules a minute truncate membrane, usually less than 2 mm long (sometimes to 2.5 mm long), the lateral margins not hardened or confluent with the sheath margins; leaves mostly on branching stems; leaf blades 2 to 7 mm wide; nodes glabrous ..... ***Muhlenbergia*** species

50. Ligules 2 to 6 mm long, the lateral margins hardened and similar to the sheath tissue so as the sheath margins appear to form upward projections past the collar; leaves mostly in a basal tuft; leaf blades 5 to 10 mm wide; nodes pubescent (sometimes sparsely) ***Sorghastrum nutans***

51. Lower leaf sheaths usually compressed (flattened) and keeled (sometimes not), loose and only partly clasping the stem (margins not overlapping less than half the sheath length); lower sheaths and stems often purplish-red, especially near nodes; plants perennial; root stalk woody and tough; short rhizomes sometimes present **52**

51. Lower leaf sheaths not compressed or keeled (except for annual species of *Digitaria*), more or less tightly clasping the stem more than half the sheath length; lower sheaths and stems usually green, sometimes with purplish-red pigments; plants perennial or annual; root stalk not particularly woody and tough; rhizomes present or not **53**

52. Blades usually 5 to 10 mm wide; blade mid-ribs abaxially distinct and prominent, usually yellowish in colour (at least basally) and much wider than other major veins ..... ***Andropogon gerardii***

52. Blades usually 2 to 6 mm wide (sometimes wider); blade mid-ribs not abaxially distinct or prominent, usually

whitish- or greyish-green and only slightly wider than other major veins
..... ***Schizachyrium scoparium***

53. Sheaths (at least basal ones) usually pubescent; blades mostly pubescent (at least on adaxial surface and basally); collars with long hairs (except *Hordeum jubatum*) ... **54**

53. Sheaths glabrous (sometimes slightly scabrous); blades usually glabrous or scabrous (except with short retrorse hairs on basal margins in *Phleum pratense* and the basal sheaths and blade margins of *Avena fatua*); collars glabrous **58**

54. Sheaths compressed (flattened); auricle region with crinkly hairs; ligules entire (crenate but not ciliate); plants annual **55**

54. Sheaths not compressed; auricle region glabrous or with straight hairs; ligules minutely ciliate; plants perennial **56**

55. Sheaths with long hairs; blades pubescent, 4 to 10 mm wide ..... ***Digitaria sanguinalis***

55. Sheaths (at least the basal ones) usually sparsely pubescent; blades glabrous except for crinkly hairs near base (adaxial surface), 1 to 4 mm wide (rarely to 6 mm) ***Digitaria ischaemum***

56. Long hairs on margins of collars; ligules about 2 mm long; blades usually yellow-green or bright green, broad and flat; foliage coumarin scented when crushed ..... ***Anthoxanthum odoratum***

56. Margins of collars glabrous; ligules 0.5 to 1 mm long; blades bluish green, glaucous, narrow and flat or rolled; not scented when crushed **57**

57. Auricles, if present, small or rudimentary, often only one ..... ***Elymus trachycaulus***

57. Auricles, if present, small and fragile, in pairs
..... ***Hordeum jubatum***

58. Blades less than 1.5 mm wide, soft, usually rolled (or involute) and thread-like especially when dry; plants tufted, without rhizomes
..... ***Agrostis scabra***

58. Blades more than 1.5 mm wide, flat, rolled or involute, plants with or without rhizomes **59**

59. Ligules less than 1.5 mm long, truncate **60**

59. Ligules more than 1.5 mm long **62**

60. Basal leaf blades 30 to 90 cm (much longer than twice the sheath length), recumbent, evergreen (persisting through the winter), gradually narrowed to a more or less stiff and twisted base (mature blades are oriented "upside down"), opposite surfaces distinctly different in colour, the upper (abaxial) surface glossy dark green, the lower (adaxial) surface glaucous
..... ***Oryzopsis asperifolia***

60. Basal leaf blades less than 30 cm long (less than twice as long as leaf sheath), erect of lax but not recumbent, not evergreen, not gradually narrowed to a stiff and twisted at base, surfaces similar in colour, not glossy dark green , sometimes glaucous **61**

61. Blades 1.5 to 3.5 mm wide, never glaucous; auricles absent; plant with short rootstocks or stolons
..... ***Agrostis capillaris***

61. Blades 3 to 8 mm wide, sometimes glaucous; auricles rudimentary or absent; plant caespitose
..... ***Elymus trachycaulus***

62. Foliage strongly smelling of coumarin when crushed, a dark lustrous green colour when fresh; long white creeping rhizomes
..... ***Hierochloë odorata***

62. Foliage not smelling of coumarin when crushed, not a deep lustrous green colour when fresh; rhizomes present or absent **63**

63. Margins of collars with retrorse hairs; ligules with a prominent notch at either side, abaxially glabrous; stem often with a swollen corm-like base ..... ***Phleum pratense***

63. Margins of collars glabrous; ligules without a notch at either side (sometimes lacerate), abaxially minutely pubescent; stem without a swollen corm-like base, except rarely in some varieties of *Arrhenatherum elatius* **64**

64. Sheaths keeled; nodes usually puberulent
..... ***Arrhenatherum elatius***

64. Sheaths not keeled; nodes glabrous **65**

65. Rhizomes absent (or if present, short and non-creeping, plants being loosely caespitose) **66**

65. Rhizomes present (plants not caespitose) **69**

66. Plants annual; basal sheaths glabrous or with scattered long hairs; young blades with long hairs along basal margins ..... ***Avena fatua***

66. Plants perennial; basal sheaths glabrous; young blades without long hairs on margins **67**

67. Stolons and rhizomes absent; blades 1 to 20 mm wide, usually about 10 mm, widest near the middle and gradually tapering toward both ends; ligules 2 to 10 mm long, usually about 5 to 8 mm; stems erect; plants usually of forests ***Cinna latifolia***

67. Stolons or rhizomes usually present; blades less than 8 mm wide, widest near the base and gradually tapering toward the apex; ligules less than 4 mm long; stems usually decumbent at base; plants usually of open or semi-open habitats ... **68**

68. Stolons absent, short non-creeping rhizomes often present (loosely caespitose); stems more or less erect; blades 3 to 8 mm wide; ligules on basal leaves 1.5 to 2.5 mm long, truncate
..... ***Alopecurus pratensis***

68. Stolons present, leafy, prostrate, rooting at nodes; stems usually decumbent or recumbent; blades usually less than 3 mm wide; ligules on basal leaves 2 to 4 mm long, rounded or obtuse
..... ***Agrostis stolonifera***

69. Stems stiffly erect from base; new shoots dark brownish, stiffly erect and long attenuate (subulate); base of stems with reduced scaley leaves that are hard and sharp; sheaths glabrous or sometimes pubescent
..... ***Calamagrostis canadensis***

69. Stems erect, decumbent or recumbent; new shoots pale or light brown, erect or decumbent, acute but not long attenuate; if reduced leaves present at the base of stems, then not hard and scaley; sheaths glabrous **70**

70. Large robust plants, usually in moist areas; base of the stems 3 to 8 mm wide; blades 5 to 15 mm wide; ligules white, papery, 2 to 8 mm long, acute or obtuse; sheaths often with cross veins visible (especially on older sheaths)
..... ***Phalaris arundinacea***

70. Plants various; base of stems 1 to 3 mm wide; blades 1.5 to 7 mm wide; ligules translucent, thinly membranous,

1.5 to 4 mm long, rounded or acute; sheaths with cross veins rarely visible **71**

71. Stolons absent; long creeping underground rhizomes; leaf blades usually more than 3 mm wide
..... ***Agrostis gigantea***

71. Stolons present, leafy, prostrate, rooting at nodes; leaf blades usually less than 3 mm wide
.....***Agrostis stolonifera***

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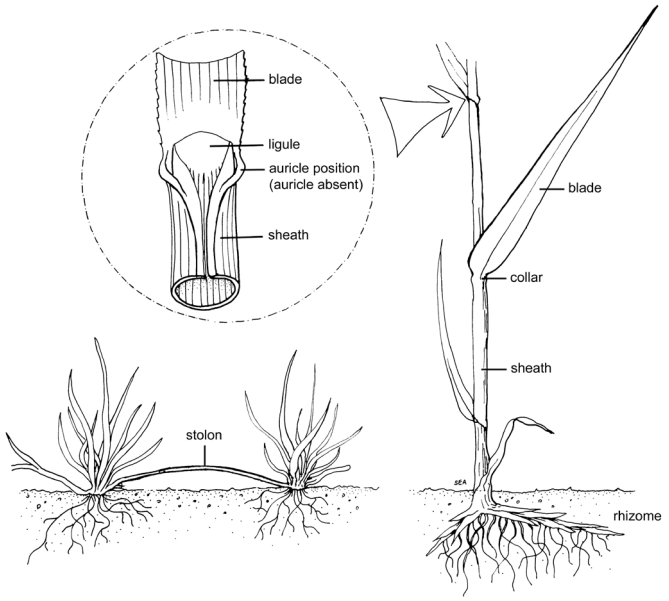

Figure 1. Plant habit and leaf parts.

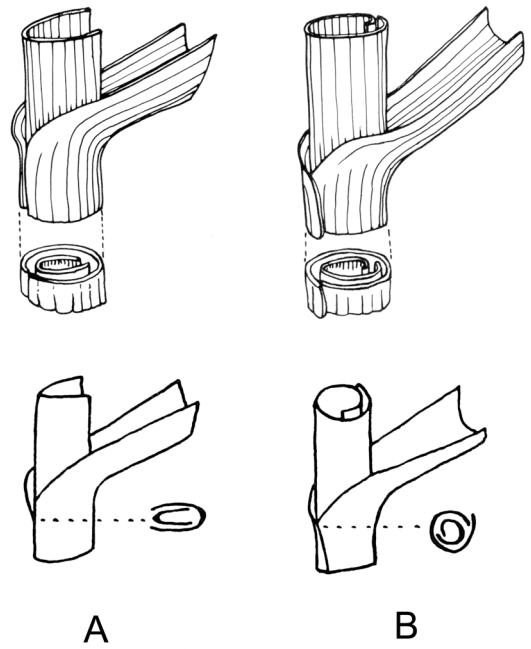

Figure 2. Leaf vernation. A. Leaf folded; B. Leaf rolled.

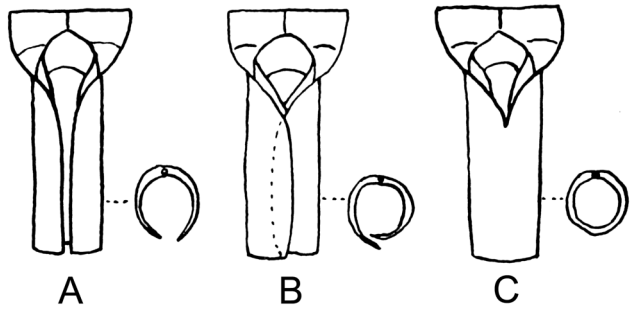

Figure 3. Sheath types. A. Sheath open, margins not joined and not over-lapping; B. sheath open, margins not joined but overlapping; C. Sheath closed, margins joined.

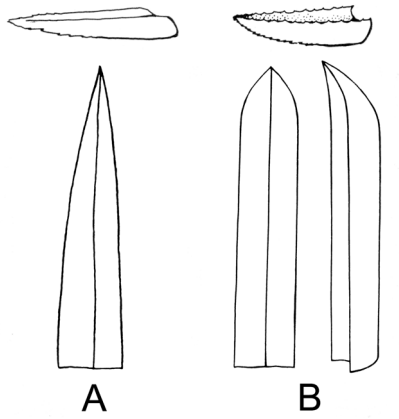

Figure 4. Leaf blade tips. A. Leaf blade tapering to a sharply pointed apex; B. Leaf blade curved at the tip into a "boat-shaped" or prow-like apex.

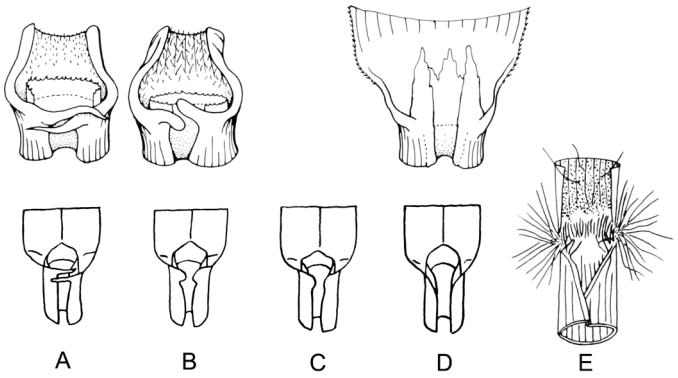

Figure 5. Auricle types and leaf blade vestiture on adaxial surface. A. Auricles claw-like, blade scabrous (above); B. Auricles rounded, blade pubescent (above); C. Auricles rudimentary; D. Auricles absent, blade glabrous (above); E. Auricles with a tuft of hairs, blade with scattered long hairs.

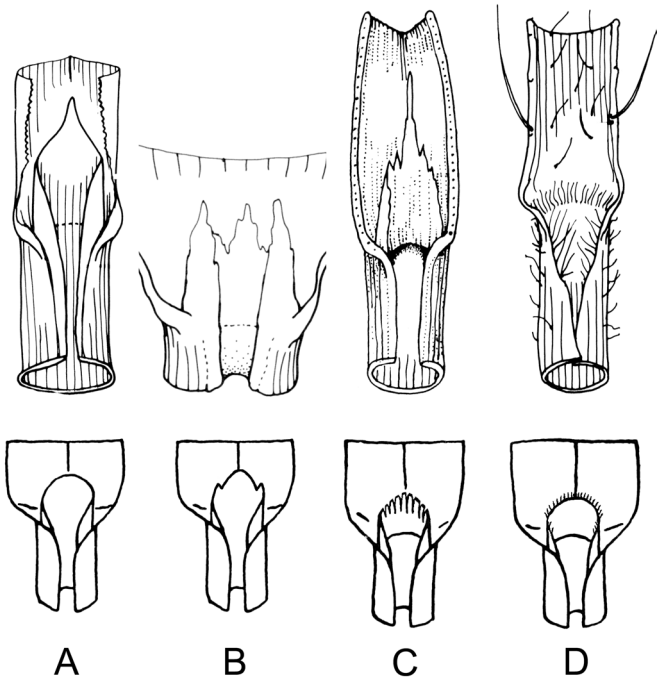

Figure 6. Ligule types. A. Ligule entire, rounded (below) or acute (above); B. Ligule notched; C. Ligule lacerate; D. Ligule composed of hairs (above), a ciliate membrane (below).

Table 1. List of grass species in the key with authorities, common names and common synonyms.

Name and Authority	**Common name**	**Common synonyms and comments**
Agropyron pectiniforme Roem. & Schult.	crested wheatgrass	*Agropyron cristatum* auct.
Agrostis capillaris L.	browntop	*Agrostis tenuis* Sibth.
Agrostis gigantea Roth	redtop	*Agrostis alba* auct.
Agrostis scabra Willd.	hair grass	
Agrostis stolonifera L.	creeping bent grass	*Agrostis palustris* Huds.
Alopecurus pratensis L.	meadow foxtail	
Andropogon gerardii Vitman	big bluestem; turkey foot	
Anthoxanthum odoratum L.	sweet vernal grass	
Arrhenatherum elatius (L.) J. & C. Presl	tall oat grass	
Avena fatua L.	wild oat	
Bromus ciliatus L.	Canada brome	
Bromus inermis Leysser	smooth brome	
Bromus japonicus Murray	Japanese brome	
Bromus tectorum L.	downy brome, hairy brome	
Calamagrostis canadensis (Michx.) P. Beauv.	Canada blue joint	*Calamagrostis langsdorffii* (Link) Trin.
Cinna latifolia (Trevir. *ex* Göpp.) Griseb.	drooping woodreed	

Name and Authority	Common name	Common synonyms and comments
Dactylis glomerata L.	orchard grass	
Danthonia spicata (L.) Roem. & Schult.	poverty oatgrass	
Dichanthelium acuminatum (Sw.) Gould & Clark	hairy panic grass	*Panicum lanuginosum* Elliot; *Panicum acuminatum* Sw.
Digitaria ischaemum (Schreber) Muhl.	smooth crab grass	
Digitaria sanguinalis (L.) Scop.	large crab grass	
Echinochloa species	barnyard grass	including: *Echinochloa crusgalli* (L.) P. Beauv., *E. microstachya* (Wieg.) Rydb., *E. wiegandii* Dore, *E. muricata* (P. Beauv.) Fernald
Elymus canadensis L.	Canada wild-rye	
Elymus repens (L.) Gould	quack grass	*Agropyron repens* (L.) P. Beauv.; *Elytrigia repens* (L.) Nevski
Elymus trachycaulus (Link) Shinners	slender wheatgrass	*Agropyron trachycaulum* (Link) H.F. Lewis
Elymus virginicus L.	Virginia wild-rye	
Eragrostis cilianensis (All.) Janchen	stink grass	
Eragrostis minor Host	little love grass	*Eragrostis pooides* P. Beauv.
Eragrostis pectinacea (Michx.) Nees	tufted love grass	
Festuca rubra L.	red fescue	
Festuca species	sheep fescue, hard fescue, etc.	including: *Festuca filiformis* Pourret (= *F. capillata* Lam.), *Festuca trachyphylla* (Hackel) Krajina (= *F. longifolia* Thuill., *F. brevipila* Tracey), *F. saximontana* Rydb., *F. brachyphylla* Schult. & Schult. f.)
Glyceria grandis S. Wats.	American manna grass	
Glyceria maxima (Hartm.) Holmb.	English water grass	
Glyceria striata (Lam.) Hitchc.	fowl manna grass	
Hierochloë odorata (L.) P. Beauv.	sweet grass	*Anthoxanthum nitens* (Weber) Y. Schouten & Veldk.
Hordeum jubatum L.	foxtail barley	
Leersia oryzoides (L.) Swartz	rice cut grass	
Leersia virginica Willd.	white grass	
Leymus mollis (Trin.) Pilger	American dune grass	*Elymus mollis* Trin.
Lolium multiflorum Lam.	annual ryegrass	*Lolium perenne* var. *aristatum* Willd.
Lolium perenne L.	perennial ryegrass	
Muhlenbergia species	muhly	including: *Muhlenbergia frondosa* (Poiret) Fernald, *M. glomerata* (Willd.) Trin., *M.*

Name and Authority	Common name	Common synonyms and comments
		mexicana Trin., *M. sylvatica* (Torr.) Torr.
Oryzopsis asperifolia Michx.	rough-leaved mountain-rice, winter grass	
Panicum capillare L.	witchgrass	
Panicum dichotomiflorum Michx.	fall panic grass	
Panicum miliaceum L.	proso millet	
Phalaris arundinacea L.	reed canary grass	
Phleum pratense L.	timothy	
Phragmites australis (Cav.) Steudel	common reed	*Phragmites communis* Trin.
Poa annua L.	annual blue grass	
Poa compressa L.	Canada blue grass	
Poa palustris L.	fowl blue grass	
Poa pratensis L.	Kentucky blue grass	
Poa trivialis L.	rough-stalked blue grass	
Schedonorus arundinaceus (Schreber) Dumort.	tall fescue	*Festuca arundinacea* Schreber,; *Lolium arundinaceum* (Schreber) Darbysh.
Schedonorus pratensis (Huds.) P. Beauv.		*Festuca pratensis* Huds.; *Lolium pratense* (Huds.) Darbysh.
Schizachne purpurascens (Torr.) Swallen	false melic	
Schizachyrium scoparium (Michx.) Nash	little bluestem	*Andropogon scoparius* Michx.
Setaria faberi R.A.W. Herrm.	giant foxtail	
Setaria pumila (Poir.) Roem. & Schult.	yellow foxtail	*Setaria glauca* (L.) P. Beauv.
Setaria viridis (L.) P. Beauv.	green foxtail	
Sorghastrum nutans (L.) Nash	Indian grass	
Spartina patens (Aiton) Muhl.	salt-meadow cord grass	
Spartina pectinacea Link	tall cord grass; freshwater cord grass	
Sporobolus cryptandrus (Torr.) A. Gray	sand dropseed	
Sporobolus heterolepis (A. Gray) A. Gray	prairie dropseed	
Sporobolus species	dropseed	including: *Sporobolus neglectus* Nash, *Sporobolus vaginiflorus* (A. Gray) A.W. Wood

Field Trip Reports

Crawford Lake

June 4, 2006

A mixture of cultural and natural history was served up for the trip to Crawford Lake led by Bill McIlveen. Crawford Lake and the nearby Calcium Pits are situated on the Niagara Escarpment, approximately 4 km southeast of Campbellville on Guelph Line. Other than the Great Lakes, the Niagara Escarpment is perhaps southern Ontario's most significant landform; it winds 725 kilometres from Queenston to the islands off the tip of the Bruce Peninsula (Riley et al. 1996). Queenston Shale underlies the area and is overlain by limestone and dolostone. The soils of the Crawford Lake area are generally shallow and high in calcium due to the underlying parent material.

The geological and cultural history of the area is captured in the sediments of Crawford Lake. It is known as a meromictic lake –it is small, deep and sheltered, so its waters do not mix in spring and fall the way most lakes do. The sediments, or varves, deposited in the bottom of the lake capture a chronological sequence of events in the watershed over the past several thousand years. Crawford Lake has been the subject of much study, from climate change (e.g.Yu and Eicher 1998) to ethnography to natural history (Hamilton Naturalists' Club and Halton/Peel Naturalists' Club 2006, Riley et al. 1996).

Crawford Lake
Photo: Michael McMurtry

Virginia Waterleaf (*Hydrophyllum virginianum*)
Photo: Michael McMurtry

Archaeological research shows that the people who originally lived in the area were Iroquoian. Crawford Lake is near the boundary between the Wendat and the Attiwandaron Nations and the area was occupied by both of these groups at different times. The presence of Corn, or Maize, (*Zea mays* ssp. *mays*) pollen in the sediments indicated the presence of aboriginal people living in the area and their reliance on agriculture for food. These people appear to have moved into the area about 11,000 years ago, not too long after the last glacier withdrew about 12,000 to 13,000 years ago. Other pollen types were detected in the sediments: White Pine (*Pinus strobus*) was present in the area for a long time and probably re-colonized abandoned corn fields. Purslane (*Portulaca oleracea*), a species that many of us think of as introduced, was also represented in the sediment layers. In fact it appears to have been present prior to European settlement. *Portulaca* was likely deposited into the lake when plants from the agricultural fields were cleaned in the lake waters. White Pine played an important role in early history of Ontario as it was much sought after to supply masts for the British Navy. Oak lumber, mainly from *Quercus alba* and *Q. rubra*, was also valuable for barrel staves and other items.

Subsequently, the Crawford Lake property was settled in 1841 by David Allison and 50 years later by the Crawford family. About 50 years ago the property was acquired by the Halton Region Conservation Authority, which still owns and manages it.

After this interesting preamble from Bill, the group hiked around the perimeter of Crawford Lake, discussing the

qualities of the lake and noticing the flora. Canada Violet (*Viola canadensis*) was in bloom and admired for the purity of its white flowers. Other native plants we observed were Alternate-leaved Dogwood (*Cornus alternifolia*) and Herb Robert (*Geranium robertianum*) and Canada Mayflower (*Maianthemum canadense*). Virginia Waterleaf (*Hydrophyllum virginianum*) was in full flower under White Ash (*Fraxinus americana*) and Eastern White Cedar (*Thuja occidentalis*). Bloodroot (*Sanguinaria canadensis*), Spikenard (*Aralia racemosa*) and Common Polypody (*Polypodium virginianum*) were present on the limestone boulders. Unfortunately the invasive Garlic Mustard (*Alliaria petiolata*) was also common, an indication of the high level of use in the area. As we moved into a wetter area we saw Bulbet Fern (*Cystopteris bulbifera*), Marsh Fern (*Thelypteris palustris*), Marsh Horsetail (*Equisetum palustre*), Water Hemlock (*Cicuta bulbifera*) and Red Maple (*Acer rubrum*). In drier habitat we noticed Black Maple (*Acer saccharum* ssp. *nigrum*), with its droopy leaves, fuzzy on the undersurface. Another relict of human use, possibly from the Crawford family era, was Periwinkle (*Vinca minor*), which often escapes into ravines from garden plantings.

Re-created Aboriginal Lodges, Crawford Lake C.A.
Photo: Michael McMurtry

We ate lunch outside the Crawford Lake Visitor's Centre and noticed two interesting non-native tree species, a specimen of Dawn Redwood (*Metasequoia glyptostroboides*) and Ginkgo (*Ginkgo biloba*). Following lunch we looked at the re-created lodges used by the former aboriginal residents, traditionally covered by American Elm (*Ulmus americana*), but in this case covered with the more available Eastern White Cedar (*Thuja occidentalis*). A small garden highlighted four sacred plants corresponding to the four directions of the medicine wheel: Sweetgrass (*Hierchloe odorata*), Tobacco (*Nicotiana tabaccum*), Sage (several species referred to with this name appear to have been used for ceremonial and medicinal purposes: White Sage, *Salvia apiana*; Dark-leaved Mugwort, *Artemisia ludoviciana*; and Prairie Sagewort, *Artemisia frigida* are some examples) and Eastern White Cedar. Following our tour of the Iroquoian village, we were off to the Calcium Pits, a nearby area where marl was mined for use in the manufacture of pesticides. Chara (*Chara* sp.), now classified

Wild Blue Phlox (*Phlox divaricata*)
Photo: Michael McMurtry

as a genus of green algae in the kingdom *Protista*, was growing in the water of these shallow ponds. The Calcum Pits area proved to be more varied botanically than the Crawford Lake area. We hiked on a trail on the opposite side of the road from the pits and soon found, with Bill's direction, a very large stand of the provincially rare Green Violet (*Hybanthus concolor*), in full bloom, that is, as full a bloom as this species gets. This is one of the more subtle violets and can be easily overlooked with its yellowish-green flowers partly hidden by foliage. It was under a canopy of Sugar Maple (*Acer saccharum*), Black Cherry (*Prunus serotina*) and White Ash. Nearby we also found Moonseed (*Menispermum canadense*), White Wild Licorice (*Galium circaezans*), Blue Cohosh (*Caulophyllum giganteum*), Canada Mayflower, Wild Blue Phlox (*Phlox divaricata*), Mountain Maple (*Acer spicatum*), Creeping Strawberry-bush (*Euonymus obovata*), Christmas Fern (*Polystichum acrosticoides*), Maidenhair Spleenwort (*Asplenium trichomanes*) and Woolly Sweet-cicely (*Osmorhiza claytonii*).

We then made our way on another trail around the Calcium Pits and observed Dwarf Raspberry (*Rubus pubescens*), Red-osier Dogwood (*Cornus stolonifera*), the fungus Dryad's Saddle (*Polyporous squamosus*), Sensitive Fern (*Onoclea*

sensibilis), Tall Hairy Agrimony (*Agrimonia gryposepala*), Running Strawberry-bush (*Euonymus obovata*)
Photo: Michael McMurtry

Small Jack-in-the-pulpit (*Arisaema triphyllum* ssp. *triphyllum*), American Elm, Eastern Bracken-fern (*Pteridium aquilinum* var. *latiusculum*), Purple Flowering Raspberry (*Rubus odoratus*) and Maple-leaved Viburnum (*Viburnum acerifolium*). Running Strawberry-bush was in flower and very common in the area.

Swamp milkweed (*Asclepias incarnata* ssp. *incarnata*) was present at a wetland margin, and nearby we also observed False Solomon's Seal (*Maianthemum racemosum*), and Star-flowered Solomon's Seal (*M. stellatum*). Scarlet-fruited Horse-gentian, also known as Wild Coffee (*Triosteum aurantiacum*), was in bloom. A small damp pocket mostly on a thick layer of peat contained Black Ash (*Fraxinus nigra*), Northern Beech Fern (*Phegopteris connectilis*), Lady Fern (*Athyrium filix-femina*), Crested Wood Fern (*Dryopteris cristata*), Bluebead-lily (*Clintonia borealis*) and Cinnamon Fern (*Osmunda cinnamomea*). On our way back to the vehicles, we noticed Red Baneberry (*Actaea rubra*), Boneset (*Eupatorium perforatum*), and a massive Red Oak that our newsletter editor couldn't resist hugging.

Wild Coffee (*Triosteum aurantiacum*)
Photo: Michael McMurtry

Leslie Collins, Newsletter Editor
Photo: Michael McMurtry

The participants on this outing would like to thank Bill for an enjoyable day and sharing his knowledge of the Crawford Lake area.

Michael McMurtry

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Sheffield Conservation Area

Saturday, July 22, 2006

From Georgian Bay to the Frontenac Axis, the southern edge of the Canadian Shield is characterized by rocky outcrops and exposed ridges often called "barrens". On this cool overcast day Todd Norris, District Ecologist for the MNR's Peterborough District, led FBO'ers around Sheffield Conservation Area, part of the Mellon Lake Barrens Conservation Reserve (CR), and one of his favourite botanizing areas. Todd advised that CR is a new term for any ANSI (Area of Natural and Scientific Interest) found on Crown land. Sheffield Conservation Area is located off of Highway 41, 11 km south of Kaladar or 37 km north of Napanee.

Before escorting us on a four kilometre walk around a series of small lakes, Todd discussed the general ecology of the area. He pointed out that recent biodiversity studies have shown that areas along the contact zone at the southern edge of the Shield tend to have much greater biodiversity. Bedrock types and soil conditions are more variable and the rugged topography creates varied microclimates. This is because some plants prefer areas on the Shield such as the bare rock area of the barrens; others prefer the adjoining off-Shield habitats while a third group can handle either.

There were drought-like conditions in some of the exposed rock due to a lack of rain. We noticed Sleepy Catchfly (*Silene antirrhina*) S5 with red sticky stem sections, Rock Spike-moss (*Selaginella rupestris*) S5, and Tickle Grass (*Agrostis scabra*) S5 - all characteristic plants of the barrens. Large-podded Pinweed (*Lechea intermedia*) S4 grew in profusion but at two heights. Plants in full flower reached 60 cm - under these was a carpet of grass-like crowded leaves, the late season basal shoots. We found the Hair-like Bulbostylis (*Bulbostylis capillaris*) S3, provincially rare (PR) but abundant in the rock crevices. We were mystified by a mint, subsequently determined to be American Dragonhead (*Dracocephalum parviflorum*) S5. Although abundant in Ontario, it is not covered in the two popular Wildflower guides (Peterson and Newcomb) perhaps accounting for our unfamiliarity. One of the early goldenrods, Upland White Aster (*Solidago ptarmicoides*) S5 was just coming into flower. Todd observed that this was an example of a plant prepared to grow in either basic or acid soils. With Atlantic Coastal affinities, Racemed Milkwort (*Polygala polygama*) S4 was identified by the 10 cm raceme of rose flowers and 2 cm lanceolate leaves.

Orchids are always worthy of special mention. When Natalie Iwanycki announced a discovery, the group in unison charged toward her find. This was a lovely stand of Slender Ladies'-Tresses (*Spiranthes lacera*) S4 the green-centred lips very evident.

After trekking up and around innumerable outcrops and swamps, we reached a high point of land about 250 metres above sea level. Perhaps considered a "granite knob" the extensive bare rock outcrop provided a 360º view of the distant horizon. Eastern Towhees and Field Sparrows sang intermittingly while a Turkey Vulture soared overhead. Todd felt this is one of the loveliest areas in his territory, quite undisturbed compared to sites farther south off the Shield. We all agreed with his assessment. There are no roads or trails—despite being south of Hwy. 7; this part of the Mellon Lake CR is so remote that a helicopter was used to convey biologists during the inventory that took place in the mid 1990's. From our vantage point we observed a 10 hectare burn on a nearby outcrop. Todd had found Indian Grass (*Sorghastrum nutans*) S4 growing opportunistically at this site. Lunch here provided us an opportunity to distinguish Black Huckleberry (*Gaylussacia baccata*) S5 from Black Chokeberry (*Aronia melanocarpa*) S5 and a profusion of Sand Cherry, the latter just recently split into three species - *Prunus susquehanae* being the identity of our example.

Following lunch, Todd noted that we had attained the 1/3 mark of our circuit of the lakes. Although serious trekking was now in order, Todd did have several interesting plants staked out. This included an attractive patch of Winged aka Shining aka Dwarf Sumac (*Rhus copallina*) S3S4. This species created confusion for the writer as all three common names are used equally, but the one I chose - Smooth Sumac - was incorrect. As everybody should know that refers to *Rhus glabra*, a species found quite nearby!

Another kilometre along the trail, Todd pointed out a specialty of the area: Poison Sumac (*Rhus vernix*) S4. Inconspicuous in summer, the foliage becomes scarlet and develops strange seedpods in fall.

Other plants we noted in passage were: Bristly Sarsaparilla (*Aralia hispida*) S5, New Jersey Tea (*Ceanothus americanus*) S4, Wild Coffee (*Triosteum aurantiacum*) S5, Broad-leaved Panic Grass (*Panicum latifolium*) S4 and Secund Rush (*Juncus secundus*) S2, the second rarest plant of the day.

We stepped around two super-size natural phenomena in close proximity - a thatch ant mound about one metre in diameter and a liquid Black Bear scat equally large. Not always well blazed, which created added diversions, the trail led us over a creek in a gorge between two outcrops. Although some participants attempted to jump from rock to rock, the best route was across an active beaver dam. The creek was edged with Pickerelweed (*Pontederia cordata*) S5, Swamp Milkweed (*Asclepias incarnata*) S5 and Cardinal Flower (*Lobelia cardinalis*) S5, all in good flower, making a lovely setting against a background of Staghorn Sumac (*Rhus typhina*) S5. With Fragrant Sumac (*Rhus aromatica*) S5, abundant around the entrance, Bill McIlveen pointed out that this had just become a four-sumac day - five if we included Poison Ivy (formerly in the *Rhus* genus).

In mid-afternoon we emerged on Hwy. 41 about ½ km south of our start location. Here on a series of south facing outcrops, Todd produced the famous Kaladar Cactus, Fragile Prickly Pear (*Opuntia fragilis*) S2. Known only from this site for almost 100 years this very stable population is over 400 kms.

disjunct from its nearest location in Michigan's Lower Peninsula. The big question has always been whether the plant is a natural phenomenon having populated the area during the Hypsithermal dry period (10,000 to 6000 BP) or an anthropogenic event, having arrived adventitiously with European settlement and road building only 200 years' ago. For romantic reasons, we may prefer the former but empirically the latter seems to be the case. This was reviewed in a thorough analysis in a recent Canadian Field Naturalist.

By 3:30 p.m., we were back at our cars. The outing had been surprisingly cool (20º) and breezy with no biting insects. We were lucky. If it had been during a typical July day, hot and muggy, the salubrious exercise provided by the undulating terrain would have become an ordeal. As we departed the Sheffield parking area, the heavy rains forecast for much earlier, commenced.

Our thanks to Todd Norris for organizing an ambitious walk through a lovely natural area replete with botanical delights.

George Bryant

White Dog's-tooth Violet (*Erythronium albidum*), Massassauga Point CA
Photo: Mary Ann Johnson