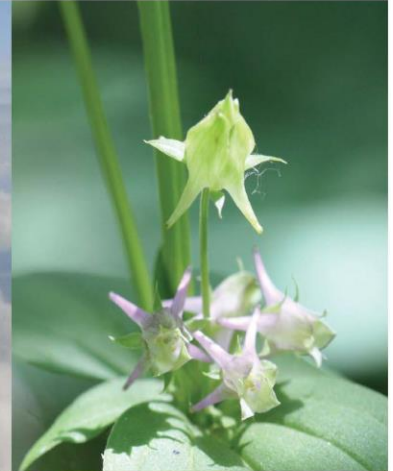


VEGETATION AND RARE PLANT SURVEY OF LOIS HOLE CENTENNIAL PROVINCIAL
PARK SUMMER 2013



TAXON METRICS
Biological
Consulting



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Community
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BLESS



Big Lake Environment
Support Society

VEGETATION AND RARE PLANT SURVEY OF LOIS HOLE CENTENNIAL PROVINCIAL
PARK SUMMER 2013

Prepared for Big Lake Environment Support Society

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I also thank Renee Howard, Barb Purin, and Dave Burkhart for volunteering their time and showing such a keen interest in learning about plant surveys, and Fred Noddin for assisting with field survey operations. Fred's also took the photo of Big Lake taken this summer as he flew back from a trip to the Northwest Territories graces the cover

On the cover: Big Lake photographed from the east on a return trip from the Northwest Territories this summer (courtesy of Fred Noddin), Spurred Gentian (*Halenia deflexa* - top), and Purple-stemmed Aster (*Aster puniceus* - bottom).

INTRODUCTION

Big Lake and adjacent land was designated Lois Hole Centennial Provincial Park in 2005 (Provincial Parks Act Section 6). The park is located immediately west of St. Albert and 16 km northwest of Edmonton (Figure 1). Current data regarding vegetation within the park is limited to observations made by park users, including members of the Big Lake Environment Support Society (BLESS), and surveys associated with nearby developments (Spencer Environmental 2005, Stantec 2007, Stantec 2010, Bruce Thompson and Associates 2009). Composition of vegetation communities is a useful indicator of ecosystem status. To detect changes in plant communities that may indicate changes in ecosystem health within the park, baseline data and a sampling strategy is required.

The purpose of this survey is to generate baseline data regarding plant diversity and community composition in Lois Hole Centennial Provincial Park. Specifically, a plant survey was conducted to generate a vegetation inventory, document rare species occurrences, identify major plant communities, and establish permanent sample plots and transects to facilitate monitoring of changes in plant community composition over time.

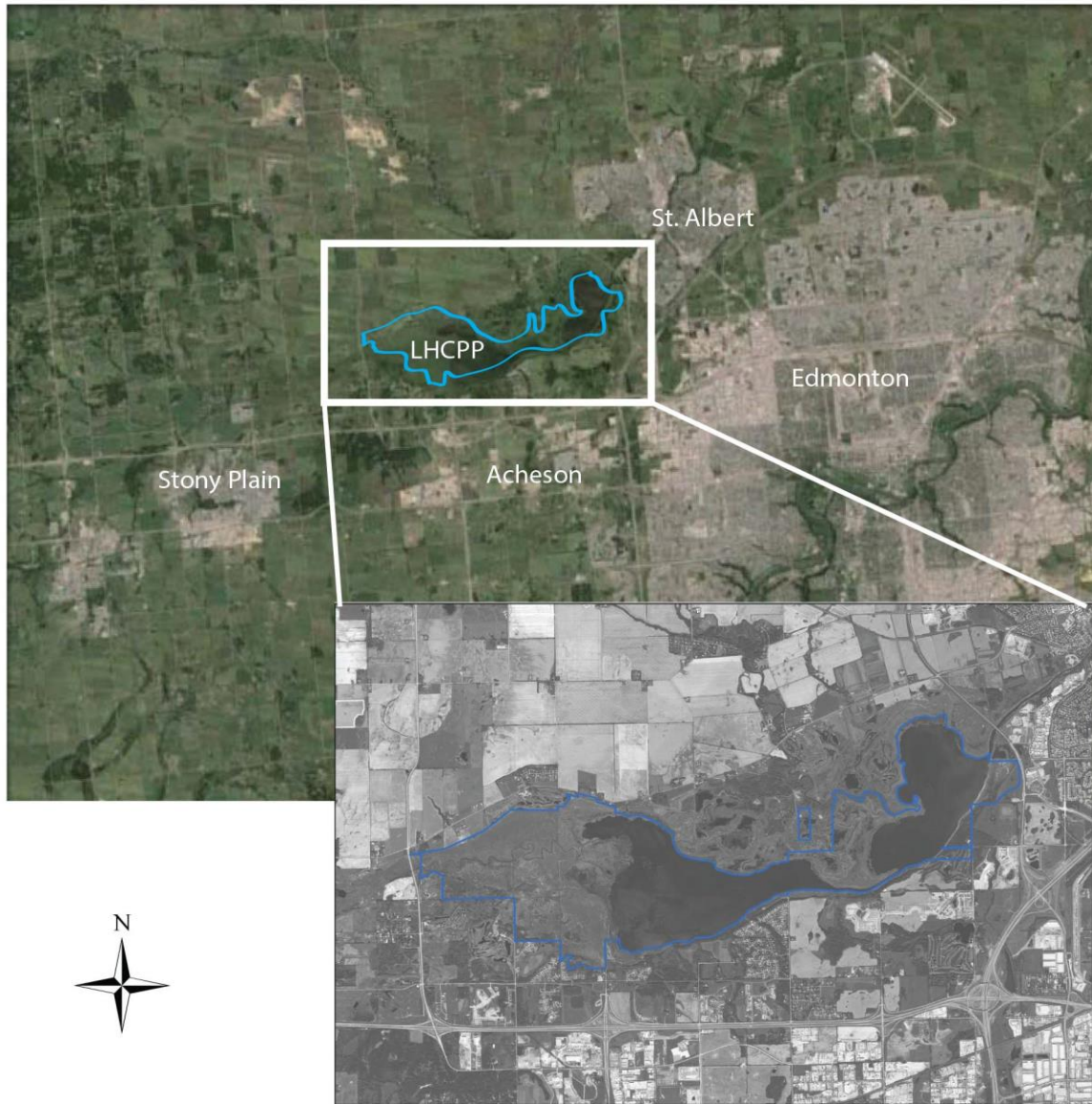


Figure 1. Location of Lois Hole Centennial Provincial Park in central Alberta. Park boundaries are indicated in blue.

METHODS

A literature review was conducted to identify rare plants or community types that occur near Lois Hole Centennial Provincial Park (LHCPP). Plant surveys conducted in association with nearby developments (Spencer Environmental 2005, Stantec 2007, Stantec 2010, Bruce Thompson and Associates 2009) were considered in addition to rare plant occurrences indicated by current Alberta Conservation Information Management Information (ACIMS) database searches as well as distribution maps and descriptions (Moss 1983, Kershaw et al. 2001). Results of the ACIMS database search are included in Appendix 2.

To document the diversity and species composition of upland vegetation communities, Google Earth satellite images were first used to determine preliminary boundaries of plant communities and identify habitats with potential to support rare species. Each of these areas was then surveyed using a plot-less method (Alberta Native Plant Council 2000) to document cryptic, ephemeral, or patchy species and determine locations for establishment of permanent 50m by 50m plots. Rare plant occurrences were further characterized with a photograph, site description, observed threats to the population, and a description of population size and demographic. This information was submitted to the ACIMS database.

Permanent 50m by 50m plots were established in upland habitats to facilitate long-term monitoring of plant communities. Timed wandering surveys (Alberta Native Plant Council 2000) of plots were used to detect as many species as possible. A permanent marker will identify the southwest corner of the 50m by 50m quadrat to facilitate re-sampling.

Permanent 100m by 0.5m transects were established perpendicular to the lakeshore. These transects account for transitions in vegetation communities associated with environmental gradients, such as water depth and corresponding soil inundation, that would not be reflected in 50m by

50m plots used to survey upland communities. A total of 17 transects were established. Locations were chosen to be evenly distributed along the shore of Big Lake, including remote and easily accessed sites.

To account for species abundance, dominant species were designated during the timed wandering survey of the 50m by 50m plot based on estimate of greatest percent cover. Furthermore, at 5m intervals starting at the southwest corner of each plot, a grid of 0.5m by 0.5m plots was

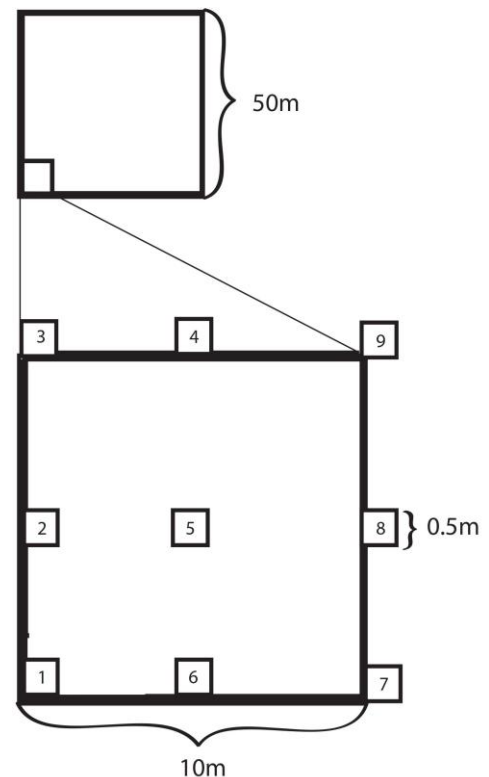


Figure 2. Layout of 50m by 50m plots used for wandering surveys and detail of small 0.5m by 0.5cm plots for estimates of species abundance. Plot numbering is consistent across sites.

established to monitor the abundance of herbaceous plants (Figure 2). Site photos were taken from the southwest corner of each 50m by 50m plot in the northeast direction. Abundance is estimated as percent cover for each 50cm by 50cm plot along transects and within the 5m by 5m grid.

RESULTS

SPECIES INVENTORY

A total of 274 species of vascular plants were documented in the park. A list of species is included in Appendix 3. Rare plants and invasive species are discussed separately below

VEGETATION COMMUNITIES

Vegetation communities are groups of plants that have a predictable species composition and structure associated with the environmental conditions of the area. A total of seven 50m by 50m plots were established to monitor the species composition and structure of five large patch community types identified within the park (Figure 1). Seventeen 100m by 0.5m transects were established to monitor the lakeshore community of Big Lake. Variation in environmental conditions associated with small landscape features, such as moist depressions or clearings in forested areas, support small patch plant communities within the large patch communities. These microhabitats contribute to the diversity of the large patch community, thus not all species will occur in the sample plots. All species detected in the park, including species observed in small patch communities during the plotless survey, are listed in Appendix 3. Coordinates for the location of plots and transects are listed in Appendix 4.

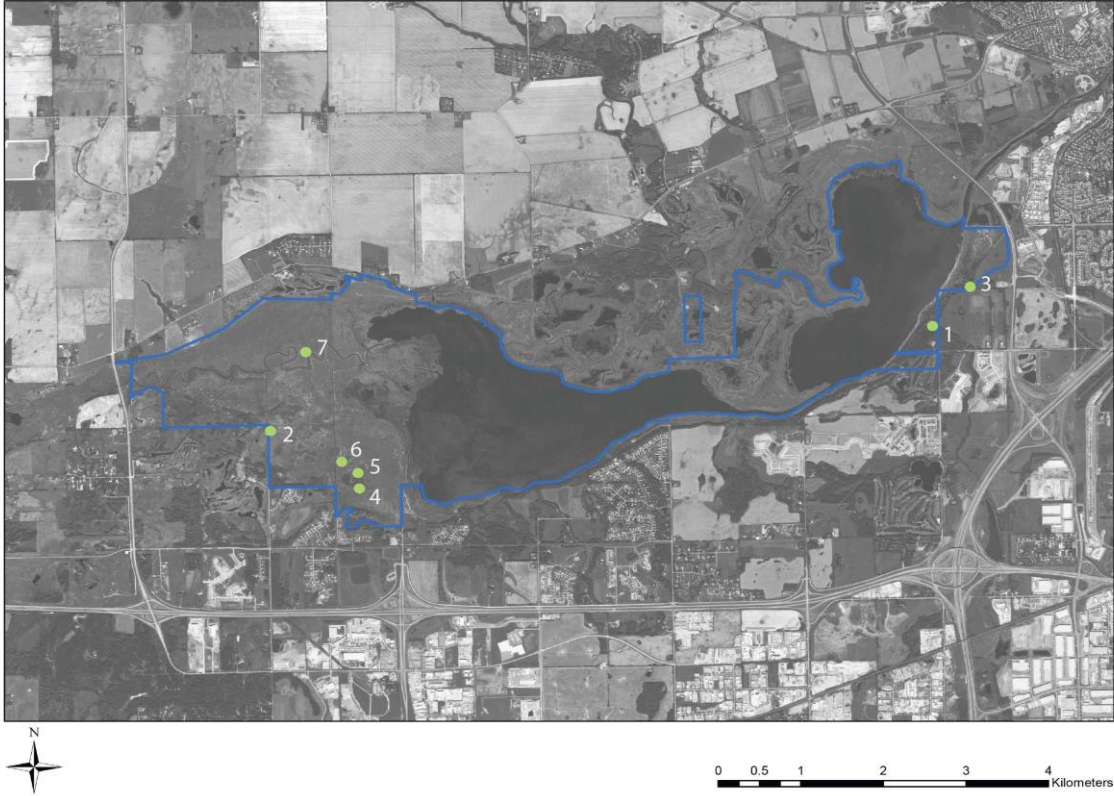


Figure 3. Location of 50m by 50m plots surveyed in Lois Hole Centennial Park.

Table 1. Description of plots established for monitoring of vegetation communities in Lois Hole Centennial Park. Species richness based on wandering survey of 50m by 50m plots. Simpson's diversity index based area estimates in grid of 0.5m by 0.5m plots.

Plot	Vegetation Community	Dominant Plants	Species Richness	Simpson's Diversity Index
1	Balsam Poplar Forest	Balsam Poplar, Highbush Cranberry, Ostrich Fern	84	0.565
2	Balsam Poplar Forest	Balsam Poplar, Red Raspberry	52	0.888
3	Aspen Forest	Trembling Aspen, Balsam Poplar, Red Osier Dogwood, Wild Sasparilla	75	0.886
4	Aspen Forest	Trembling Aspen, Choke Cherry, Wild Sasparilla	50	0.780
5	Upland Meadow	Kentucky Bluegrass, Canada Anemone	16	0.731
6	Shrubby Wet Meadow	Meadow Willow, Reed Canary Grass	42	0.601
7	Wet Meadow	Slough Sedge, Bottle Sedge	12	0.536

Balsam Poplar Forest

Plot 1. Balsam Poplar/ Highbush Cranberry/ Ostrich Fern

This plant community is locally known as the fern forest (Figure 4). This is a rare community type (S1S2) in Alberta, and occurs at this single location in LHCPP. It is bounded on the northern margin by the shore of Big Lake, is bisected by a small inflowing stream, and transitions to a birch forest on the east side, and a white spruce trembling aspen mix to the west. This year (2013), beaver activity along the creek damaged large patches of ferns and opened the canopy. New growth of Jewelweed, Pennsylvania Bittercress, and Macoun's Buttercup are colonizing these disturbed areas. While Highbush Cranberry is the dominant shrub, American Gooseberry and Beaked Hazelnut are also common.

Small, unmarked trails bisect this community and are frequented by cyclists, pedestrians, and wildlife such as moose and whitetail deer. Invasive plants do not comprise a significant proportion of area covered (no invasive species were detected in the 0.5m by 0.5m plots). It is also the most diverse community within LHCPP (84 species). Ostrich ferns account for approximately 64 percent of the total vegetation cover.



Figure 4. Plot 1 Balsam Poplar community. Site photo facing northeast from rebar marker at Southwest corner of 50X50m plot. Date September 13, 2013.

Plot 2. Balsam Poplar/ Wild Raspberry

Other Balsam Poplar forests occur in southwestern areas of the park. This site includes many small regenerating Balsam Poplar trees and many charred, standing, dead Balsam Poplars as evidence of a past forest fire (Figure 5). Wild Raspberries are a common shrub throughout the site, but there are also large patches of Red-osier Dogwood, Prickly Rose, and Buckbrush. Invasive species include Canada Thistle and Dandelion, but these do not comprise a large percentage of the total vegetation cover (approximately 12 percent).



Figure 5. Plot 2: regenerating Balsam Poplar forest. Site photo facing northeast from rebar marker at Southwest corner of 50X50m plot. Date August 22, 2013.

Aspen Forest

Plot 3. Trembling Aspen-Balsam Poplar Mix/ Red-osier Dogwood/ Wild Sarsaparilla

This forest occurs in drier areas north of the fern forest. A mix of Trembling Aspen and Balsam Poplar and a diverse shrub layer that includes Beaked Hazelnut, Red-osier Dogwood, Saskatoon, Pin Cherry, and Wild Raspberry characterizes this diverse plant community (Figure 6). Wild Sarsaparilla is found throughout the park, and here forms the dominant forb cover. Several interesting species are found in this community: the parasitic plant, Indian Pipe; an uncommon sweetpea-like vine, Purple Peavine; and one of two orchids species found in the park, Northern Green Orchid.

Disturbance in this plot includes a trail along the eastern perimeter. Adjacent fields are sources of seeds from agricultural weeds shown to compete strongly with native vegetation in other areas of the park (refer to discussion of weedy plants). Although, Canada Thistle, Dandelion, Tufted Vetch were found in the site, these plants were not abundant (not detected in 0.5m by 0.5m plots). Ornamental plants, including European Mountain Ash and Cotoneaster were likely introduced from horticultural plantings in nearby residential developments.



Figure 6. Plot 3: trembling Aspen-Balsam Poplar mixed forest. Site photo facing northeast from rebar marker at Southwest corner of 50X50m plot. Date September 13, 2013.

Plot 4. Trembling Aspen/ Choke Cherry/ Wild Sarsaparilla

Trembling Aspen stands occur in upland habitat along the south shore of Big Lake. This site is located in a patch of regenerating Trembling Aspen that forms an isolated patch of forest surrounded by shrubby meadow (Figure 7). Within the shallow lake basin, small changes in elevation allow some upland forest communities to persist as islands surrounded by wet, lowland communities. Choke Cherry is dominant in open areas of this forest, but the dense trees exclude a prominent shrub layer in many areas. Although weedy species are present, these plants do not comprise a large proportion of total area covered (less than 2 percent). There are several larger Balsam Poplars, and evidence of a past forest fire.

There is little evidence of recent human disturbance at this site, including trails. Although no rare or uncommon plants species were documented, these patches of upland forest are home to whitetail deer and are visited by moose. The nearby standing dead Balsam Poplars are used by woodpeckers, including Pileated Woodpeckers.



Figure 7. Plot 4: Trembling Aspen forest. Site photo facing northeast from rebar marker at Southwest corner of 50X50m plot. Date September 13, 2013.

Upland Meadow

Plot 5. Kentucky Bluegrass-Canada Anemone

This un-forested community occurs in transitions between low-lying areas of the Atim Creek delta and upland habitats to the south (Figure 8). It shows very low species richness (16 species), and a high proportion of invasive species comprising total vegetation cover (30 percent). This site transitions rapidly to Wet Meadow communities with decreasing elevation, and is thus expected to reflect changes in the water table. Sedges that prefer saturated soil, such as Slough Sedge, would be expected to replace common upland species such as Canada Anemone. This site is difficult to access on foot and shows no recent disturbance by people.

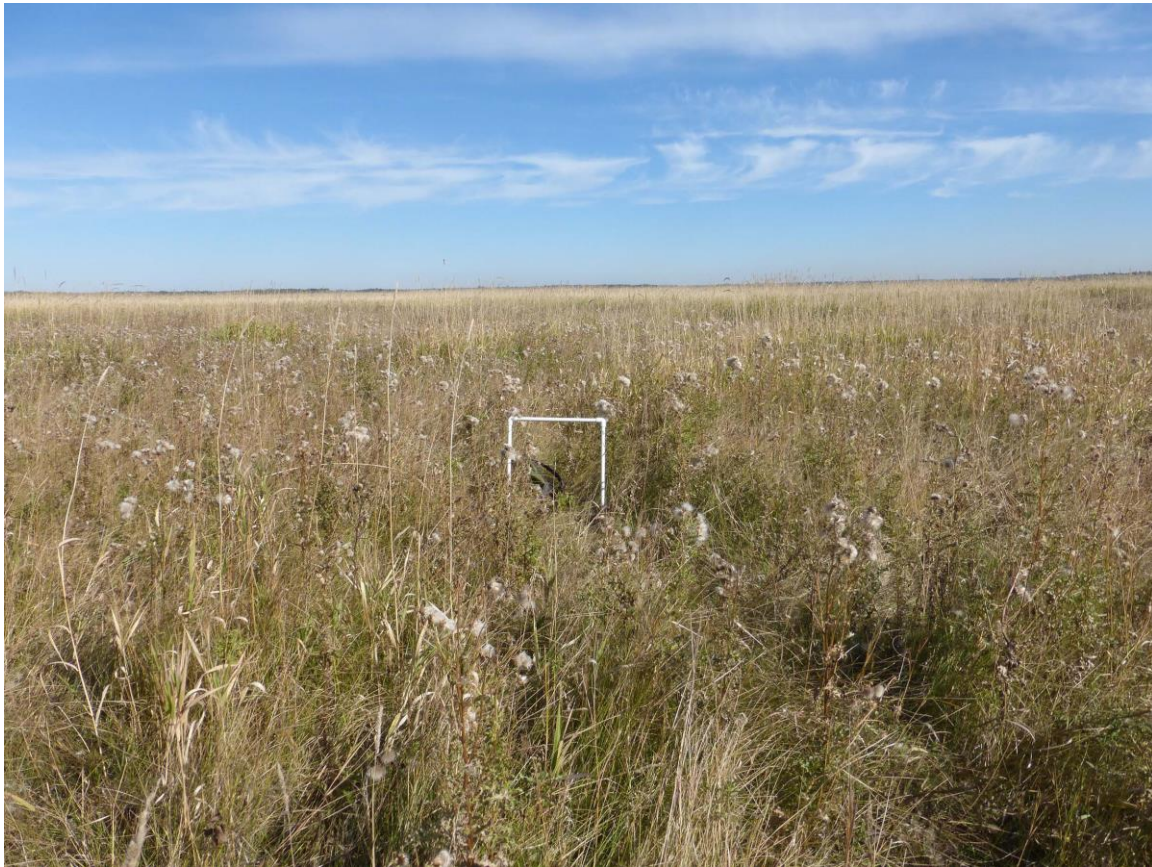


Figure 8. Plot 5: Upland meadow. Site photo facing northeast from rebar marker at Southwest corner of 50X50m plot. Date September 13, 2013.

Shrubby Wet Meadow

Plot 6. Meadow Willow/ Reed Canary Grass

Meadow Willow is the most common willow along the shores of Big Lake and also forms island-like patches near the Atim Creek Delta (Figure 9). The wet meadow at this site contains other species characteristic of wet habitats, such as Arrow-leaved Coltsfoot and Marsh Hedge Nettle, in addition to Meadow Willow. The invasive species, Canada Thistle, forms large patches mixed with Reed Canary Grass, and comprises approximately 30 percent of all forb cover. The northwest corner of the plot drops into a wetland community more typical of the transitional communities along the shore of Big Lake. Common plants here include Water Smartweed, Softstem Bulrush, and Water Sedge. Habitat heterogeneity thus affects species richness at this site (42 species).

This site is difficult to access and no recent evidence of human disturbance was observed. Blue-winged Teal and Mallard Ducks use these sites as nesting areas, and moose frequent the area.



Figure 9. Plot 6: Shrubby wet meadow. Site photo facing northeast from rebar marker at Southwest corner of 50X50m plot. Date September 14, 2013.

Wet Meadow

Plot 7. Slough Sedge-Bottle Sedge mix.

Large expanses of inundated, low-lying areas of the Atim Creek delta are populated with a mix of Slough Sedge, Water Sedge, and Bottle Sedge (Figure 10). Species richness is the lowest here of all sites surveyed (12 species), and the site shows low diversity ($SI = 0.536$). However, none of the common invasive species in other areas of the park were able to colonize this wetland habitat. This area is very difficult to access and shows no evidence of recent human activity. This shallow wetland and nearby Reed Canary Grass-covered berms are used heavily by ducks.

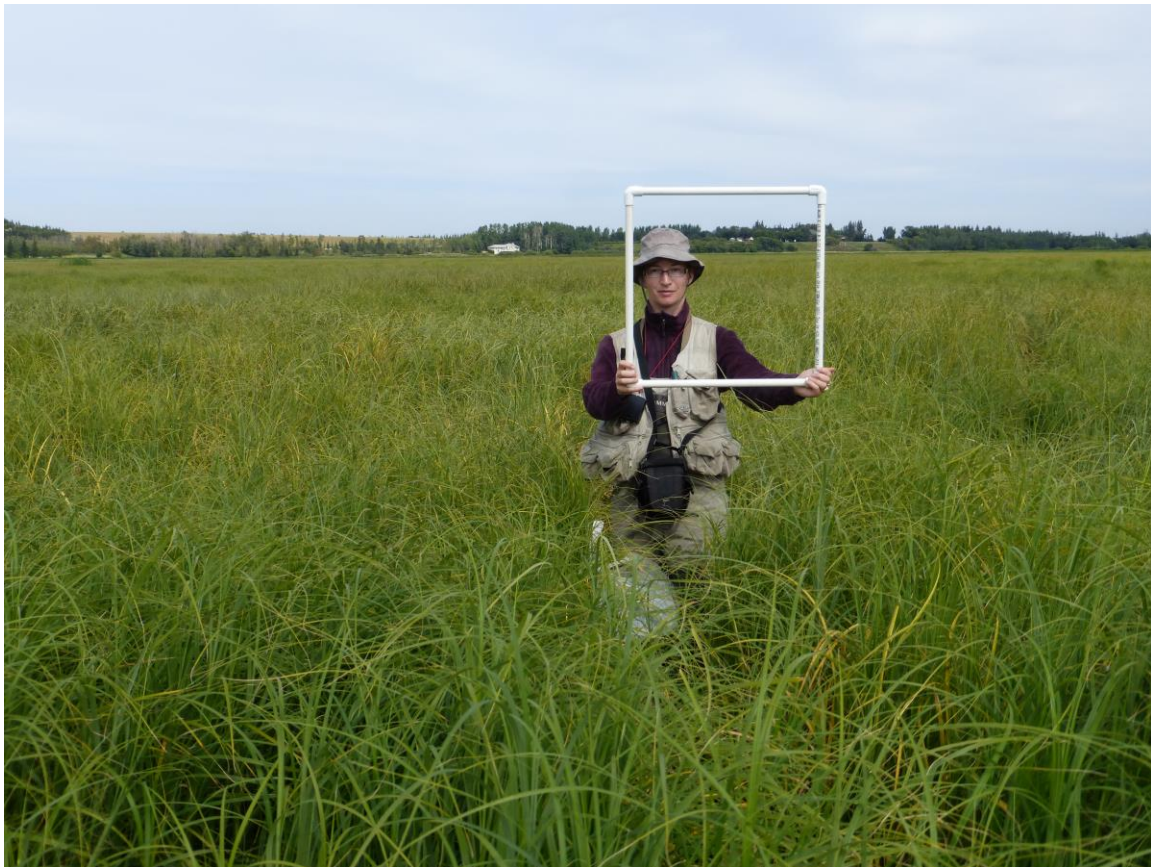


Figure 10. Plot 7: Wet meadow. Site photo facing northeast from rebar marker at Southwest corner of 50X50m plot. Date August 23, 2013. Photo courtesy of Fred Noddin.

Lake Shore and Shallow Water Communities

A total of 850 50cmX50cm plots were surveyed (739 aquatic; 111 terrestrial lake shore) along seventeen 100m by 0.5m transects. The location of transects established on the shore of Big Lake is shown in Figure 11. Natural transitions from upland habitats are first marked by a predictable series of plants depending on the water depth (Figure 12). Meadow Willow is the dominant type of shrub. Other types of willow found in the park include Sandbar Willow, Bebb's Willow, and Pussy Willow where adequate moisture is available. When willows are not abundant, this area of the shore is heavily colonized by invasive species such as Canada Thistle, Tufted Vetch, and Hemp Nettle. Although documented as a common species in prior surveys (Spencer 2006), Scentless False Mayweed was not common. This plant seldom lives for more than a year and relies on disturbed ground for germination of seeds each year. Populations can be expected to vary from year to year depending on a combination of environmental factors and availability of suitable habitat. The rare plant False Dragonhead is found in this zone.

Grass-like plants are the dominant type of vegetation in areas of the lakeshore that are too wet to support stands of willows. Reed Canary Grass is ubiquitous in moist, open areas of Lois Hole Centennial Provincial Park. Along the shore of Big Lake, this species forms a broad band in shallow water and saturated soil. There is a gradual transition from Reed Canary Grass in shallow water to sedges, including Slough Sedge, Water Sedge, and Bottle Sedge as depth increases. Sweetflag, Cattail, and Giant Bur-reed colonize deeper water. Hardstem Bulrush forms colonies in water up to 120cm deep and forms isolated island-like stands throughout the open water of Big Lake. The rare sedge, River Bulrush, forms colonies in water up to 1m deep. Invasive species tolerant of wet soil that persist in this zone include Hemp Nettle and Perennial Sow Thistle. Common forbs found in this area include Western Willow Aster, Field Mint, and Stinging Nettle.

Aquatic plants include emergent (rooted in water and producing most vegetation above the water surface), submerged, or floating species. Common aquatic plants include Duckweed, Bladderwort, Sweetflag, Water Smartweed, Slough Sedge, and Hardstem Bulrush.



Figure 11. Location of 100m by 0.5m transects established on the shore of Big Lake.

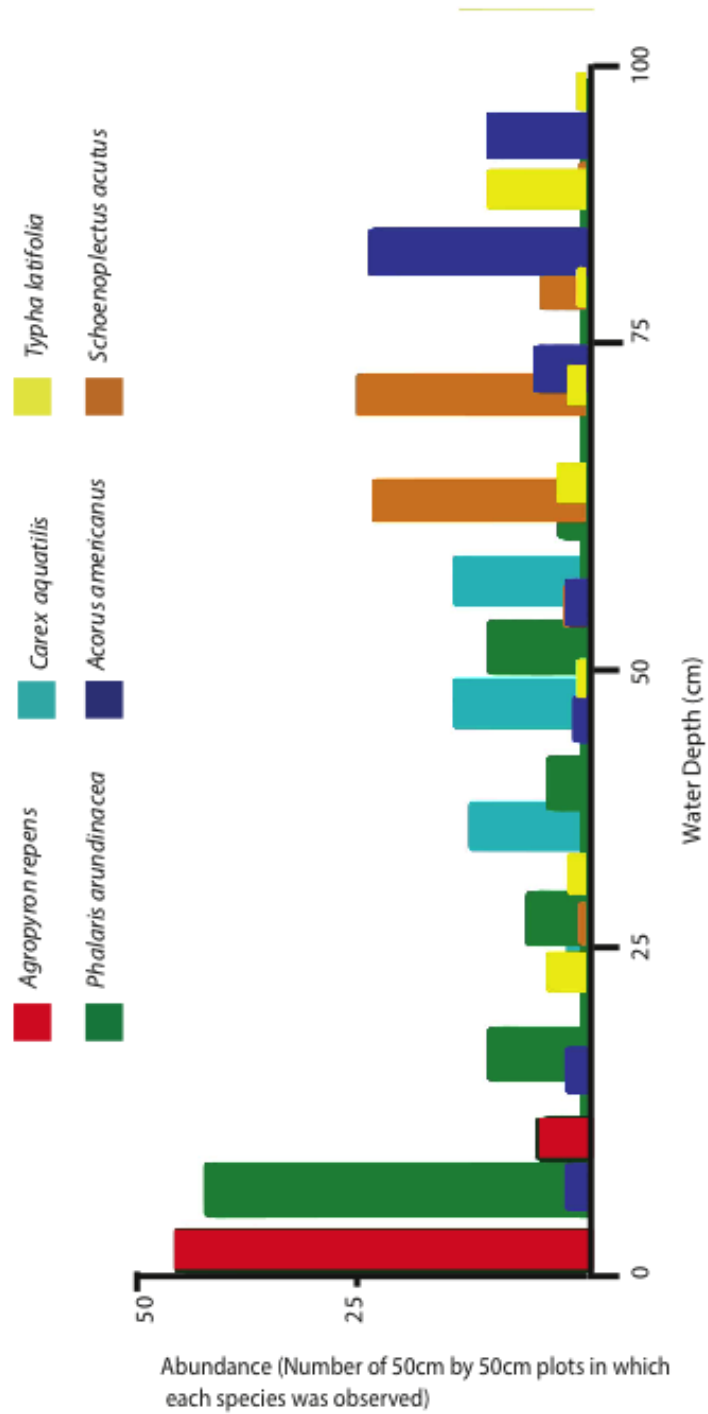


Figure 12. Distribution and abundance of some common emergent aquatic plants in Lois Hole Centennial Provincial Park. Each colour represents a different species.

COMMON PLANT SPECIES

Common native plants found in Lois Hole Centennial Park are typical of community types found in Alberta's Parkland Natural Region. Many common species are agricultural weeds. On a park-wide scale, common plants are those that are abundant (numerous individuals or high proportion of total area covered), and widespread (documented at many sites throughout the park). Some plants are locally abundant and comprise a large proportion of the total area covered, but are not found at many sites throughout the park. These species are discussed independently in the section on plant community types.

Table 2. Common plants in Lois Hole Centennial Park.

Common Name	Latin Name	Native/ Introduced
Reed Canary Grass	<i>Phalaris arundinacea</i>	Native/Introduced
Kentucky Bluegrass	<i>Poa pratensis</i>	Native/ Introduced
Perennial Sow Thistle	<i>Sonchus uliginosus</i>	Introduced
Stinging Nettle	<i>Urtica dioica</i>	Native
Canada Thistle	<i>Cirsium arvense</i>	Introduced
Slough Sedge	<i>Carex atherodes</i>	Native
Bottle Sedge	<i>Carex utriculata</i>	Native
Duck Weed	<i>Lemna minor</i>	Native
Bladderwort	<i>Utriculata vulgaris</i>	Native
Hard Stem Bulrush	<i>Scirpus acutus</i>	Native
Trembling Aspen	<i>Populus tremuloides</i>	Native

Balsam Poplar	<i>Populus balsamifera</i>	Native
Manitoba Maple	<i>Acer negundo</i>	Native/ Introduced
Meadow Willow	<i>Salix petiolaris</i>	Native
Red Raspberry	<i>Rubus ideaus</i>	Native
Water Smartweed	<i>Polygonum amphibium</i>	Native

RARE AND UNCOMMON PLANTS

The Alberta Conservation Information Management System (ACIMS) database ranks rarity in plant species according to the number of observed populations globally, and within Alberta. Species are assigned a subnational status (S rank) according to their rarity in Alberta, and a global status (G rank) for their global abundance. In this ranking system, rare plants are those with few observed populations within Alberta (S1 plants are known from less than five occurrences, S2 plants from less than 20 occurrences, S3 from less than 100 occurrences), or that are otherwise vulnerable due to biological characteristics and habitat requirements. Populations of a subset of rare plants are actively monitored by ACIMS. These species are included on the tracking and watch lists.

Two rare species were previously documented within Lois Hole Centennial Provincial Park: Smooth Sweet Cicely (ACIMS database) and Leafy Pondweed (Spencer Environmental 2006). Results of current ACIMS database searches indicate that several other species grow in areas outside park boundaries (Appendix 1). Of these species, no habitat was found for *Malaxis paludosa*, which grows in Sphagnum moss in bogs and fens. However, *Eupatorium maculata* (moist fields and open woods), *Eleocharis elliptica* and *Rhynchospora capillacea* (calcareous fens), *Muhlenbergia racemosa* (variety of habitats with moist soil), and *Bromus latiglumis* (riparian habitats, including fields, forests, and thickets) could occur in the park, but were not detected in this survey.

Rare and Uncommon Plants in Lois Hole Centennial Provincial Park

Twenty-one species of rare plant with a S-rank of three or less were found during this survey (Table 3). Four of these species are tracked by ACIMS: False Dragonhead (*Physostegia ledinghamii*), River Bulrush (*Bulboschoenus fluviatilis*), Smooth Sweet Cicely (*Osmorhiza longistylis*), and Golden Saxifrage (*Chrysosplenium iowense*). Report sheets were submitted to ACIMS. When adequate material was

available, specimens were collected and submitted to the University of Alberta Vascular Plant Herbarium (ALTA). Although a species similar to Leafy Pondweed, specifically Small Pondweed, was found in open water of Big Lake, this rare species was not observed.

Table 3. Rare and uncommon plants detected in Lois Hole Centennial Park.

* Species tracked by the Alberta Conservation Information System.

Common Name	Latin Name	Location and habitat description	Rank
River Bulrush*	<i>Bulboschoenus fluviatilis</i>	Several patches in water up to 1m deep at margin of Big Lake.	S1G5
Smooth Sweet Cicely*	<i>Osmorhiza longistylis</i>	Individual plants in moist Balsam Poplar forest.	S2G5
Golden Saxifrage*	<i>Chrysosplenium iowense</i>	Moist depressions in forests.	S3G3
False Dragonhead	<i>Physostegia ledinghamii</i>	Seasonally inundated shore of Big Lake.	S3G3G4
Thimbleweed	<i>Anemone riparia</i>	Moist riparian habitat in southeast areas.	S3G4
Jewelweed	<i>Impatiens noli-tangere</i>	Moist forest throughout park.	S3G4G5
Ostrich Fern	<i>Matteuccia struthiopteris</i>	Moist Balsam Poplar forest.	S3G5
Tall Meadow Rue	<i>Thalictrum dasycarpum</i>	Open forest.	S3G5
Marsh Willowherb	<i>Epilobium palustre</i>	Margins of shallow ponds and floating logs.	S3G5
Marsh Cudweed	<i>Gnaphalium palustre</i>	Margins of shallow ponds and floating logs.	S3G5
Highbush Cranberry	<i>Viburnum opulus</i>	Moist Balsam Poplar forest.	S3G5
Tufted Loosestrife	<i>Lysimachia thrysifolia</i>	Seasonally inundated shore of Big Lake.	S3G5
Purple Peavine	<i>Lathyrus venosus</i>	Forest margins and open forest.	S3G5

Spotted Coralroot	<i>Corallorhiza maculata</i>	Upland habitats in southern region of park.	S3G5
Indian Pipe	<i>Monotropa uniflora</i>	Upland habitats in southern region of park.	S3G5
Rough Water-horehound	<i>Lycopus asper</i>	Moist, forested shore of Big Lake.	S3G5
Northern Water-horehound	<i>Lycopus uniflorus</i>	Moist, open areas on the shore of Big Lake.	S3G5
Horned Pondweed	<i>Zannichelia palustris</i>	Shallow to deep water of Big Lake.	S3G5
Hornwort	<i>Ceratophyllum demersum</i>	Shallow to deep water of Big Lake.	S3G5
Retrorse Sedge	<i>Carex retrorsa</i>	Inundated soil under forest canopy, often in association with beaver disturbance.	S3G5
White Wintergreen	<i>Pyrola elliptica</i>	Upland habitat in southern region of park.	S3G5

River Bulrush (*Bulboschoenus fluviatilis*) (Figure 13) is very rare in Alberta (S1 - known from less than five occurrences). It is more common in southern parts of its range, and thus global populations are considered secure (G5). This plant has a high conservation value within Lois Hole Centennial Provincial Park because patches are large and perennial, and can thus be expected to persist in the current locations for many years. Furthermore, fragments of rhizome from large patches were observed spreading to other areas of Big Lake. Importantly, maintenance of these large patches allows colonization of other suitable habitat. In consideration of future development, the stems are brittle and were observed to be intolerant of mechanical damage caused by boating and wading activities.

Plants are distinctive in appearance, but seldom observed because of their location. The flower clusters are comprised of compound umbels tipped with spikelets 1-3 cm long. In July, the three-parted style that distinguishes this plant from *Scirpus paludosa* is clearly visible. Stems are triangular, 1-1.5 m tall, and form patches in water up to 1 m deep at the margin of Big Lake. A specimen was collected and submitted to ALTA.



Figure 13. River Bulrush (*Bulboschoenus fluviatilis*) flower cluster and leaves growing in shallow water of Big Lake. Photo courtesy of Renee Howard.

Golden Saxifrage (*Chrysosplenium iowense*) (Figure 14) is a rare plant (S3) that colonizes moist, shaded soil, often near flowing water. It is never common throughout its range (G3). Within Lois Hole Centennial Provincial Park, it forms small colonies in moist depressions and seepages in forested areas. The persistence of this plant in the park is linked to availability of habitat, and efforts to channelize water flow could reduce available habitat.

Plants are distinctive, but small and easily overlooked. Stems are less than fifteen cm tall. Leaves are round to kidney-shaped with a scalloped margin. Flowers are small and inconspicuous, but are surrounded by yellowish sepals and bracts that are reminiscent of petals. Unequal size of the sepals distinguishes this species from the similar species Northern Golden Saxifrage (*Chrysosplenium tetrandrum*).



Figure 14. Golden Saxifrage (*Chrysosplenium iowense*) plants in a moist depression in a forested area of Lois Hole Centennial Park.

False Dragonhead (*Physostegia ledinghamii*) is a conspicuous, showy rare plant (S3). It is uncommon throughout its range, but global populations are secure (G4). Plants are usually single-stemmed and less than 1m tall, with pairs of leaves on opposite sides of the stem. Flowers are large and showy, rose-pink to purplish in colour, and borne in a terminal spike. Individual plants grow scattered throughout moist woods and thickets near the shore of Big Lake in Lois Hole Centennial Park. The conspicuous flowers and single stems make these plants susceptible to picking.

Smooth Sweet Cicely (*Osmorhiza longistylis*) is rare in Alberta (S2), but common throughout its range in North America (G5). Plants are up to 1m tall and loosely branched. Leaves are softly hairy and twice divided into segments so that they superficially resemble fern or carrot leaves. This species is distinguished from the similar species Sweet Cicely (*Osmorhiza depauperata*) by having persistent bracts in the inflorescence, and longer styles (2-3mm). Within the park, these plants grow in moist Balsam Poplar forests, often bordering trails.

WEEDS AND INVASIVE SPECIES

Weed plants are loosely designated as plants growing where they are not wanted. Within the park, introduced species that displace native vegetation can be considered “weeds”. All introduced species are included in the species list in Appendix 3.

Some weeds pose a more serious management concern than others. In Alberta, the most aggressive species are targeted for eradication when found and are classified as prohibited noxious weeds, whereas species that require management are considered noxious weeds (Alberta Weed Control Act). Noxious species within the park include Canada Thistle (*Cirsium arvense*), Perennial Sow Thistle (*Sonchus arvensis*), Scentsless Chamomile (*Tripleurospermum inodorum*), and Tansy (*Tanacetum vulgare*). Of these, only Canada Thistle was abundant. This unpleasantly spiny plant grows in dense patches in some areas and has effectively invaded all open, upland habitats. No prohibited noxious weed species were observed.

Several introduced species not listed in the Alberta Weed Control Act form a dominant component of the flora in some open areas of the park. Although these species are not actively managed, they potentially displace native species along the shore of Big Lake. The most abundant and ubiquitous of these weeds include Quack Grass, Hemp Nettle, and Tufted Vetch.

Several species with large ranges may be represented in the park by both introduced and native strains, which are difficult to distinguish based on appearance. Reed Canary Grass is an important example because this species forms dense stands in moist areas of the park and along the shore of Big Lake. Other species found within the park that could represent either native and/or introduced populations include Green Ash, Kentucky Bluegrass, Manitoba Maple, and Yarrow.

CONCLUSIONS AND RECOMMENDATIONS

This study identifies five large patch community types in Lois Hole Centennial Provincial Park (LHCPP). The plots and transects established in the summer of 2013 provide a means of monitoring changes in these communities, and the Big Lake ecosystem.

Changes in flora within the park could be caused by changes in water level/flooding regime or disturbance associated with nearby developments and recreational use of the park and surrounding area. Aquatic plant distributions are linked to water depth. Thus, changes in water level or flooding regime will manifest as changes in vegetation along transects. No plants were detected with specific known habitat requirements linked to water quality, however. Abundance of invasive and weedy species is often associated with proximity to development. This study shows that weeds currently form a dominant component of the flora in some areas of LHCPP. While eliminating invasive species is not practical due to the size and extent of colonization in the park and proximity to seed sources from nearby agricultural areas, invasive species can be managed. Suitable habitat is reduced for species with high light requirements (most agricultural weeds) by rehabilitating cleared areas with plantings of native trees and shrubs. Furthermore, although weeds were not detected in aquatic habitats, Flowering Rush (*Botomus umbellatus*), Purple Loosestrife (*Lythrum salicaria*), Yellow Iris (*Iris pseudoacorus*), and Eurasian Watermilfoil (*Myriophyllum spicatum*) could be introduced from nearby horticultural plantings or transported in ballast water from infested areas.

LITERATURE CITED

- Alberta Conservation Information Management System. 2012. Online data accessed April 8, 2013. Alberta Tourism and Recreation, Edmonton, Alberta.
- Alberta Native Plant Council. 2000. ANPC Guidelines for Rare Plant Surveys in Alberta. Garneau P.O. Box 52099, Edmonton, Alberta, T6G 2T5.
- Alberta Biodiversity Monitoring Institute Summer Terrestrial Protocols. Version 2007-12-13.
- Alberta Weed Control Act and Regulations. 2013. Alberta Agriculture and Rural Development.
- Annand AD. 2010. The 1910 fires in Alberta's foothill and rocky mountain regions. Honors Bachelor of Science. Mountain Legacy Project. University of Victoria 2010.
- Bush CD. Ed. 1993. Native Plant Collection and Use Guidelines. Alberta Native Plant Council. Garneau P.O. Box 52099, Edmonton, Alberta, T6G 2T5.
- Bruce Thompson and Associates Inc. 2009. Big Lake Neighbourhood Three Ecological Design Report.
- City of St. Albert Office of Environment. 2012. Sturgeon River State of the Watershed Report; Technical Report. Prepared for the City of St. Albert.
- Kelly C, Pickering CM, and Buckley RC. 2003. Impacts of tourism on threatened plant taxa and communities in Australia. *Ecological Management and Restoration* 4: 37-44.
- Provincial Park Act. 2005. Provincial Park Act Section 6 Lois Hole Centennial Provincial Park Order. Province of Alberta.
- Spencer Environmental Management Services Ltd. 2005. Year 2005 Riel Marsh Baseline Study St. Albert, Alberta. Project Number: EP-223. Prepared for City of St. Albert, Planning and Engineering.
- Stantec Consulting Ltd. 2007. Big Lake Neighbourhood One Ecological Design Report. United Big Lake Limited Partnership 110217625.
- Stantec Consulting Ltd. 2010. Big Lake Neighbourhood Three Neighbourhood Structure Plan.

APPENDICES

APPENDIX 1. Melanie Patchell's Curriculum Vitae

Melanie Patchell

Curriculum Vitae

Edmonton, AB

T5P 1N8

ph: (780) 691-1985

email: patchell@ualberta.net

EDUCATION

Masters of Science in Botany: University of Alberta

Supervisor: Dr. Jocelyn Hall

Project Title: Evolutionary developmental genetics of floral symmetry in *Cleome violacea* (Cleomaceae).

Abstract: Included as Appendix.

Bachelor of Science in Botany, with honours: University of Alberta

Supervisor: Dr. Jocelyn Hall

Project Title: Development of floral symmetry in Old World *Cleome*.

PUBLICATIONS, PRESENTATIONS, POSTERS

- 1) **Melanie J. Patchell, Eric H. Roalson, and Jocelyn C. Hall. 2013. Resolved phylogeny of Cleomaceae based on all three genomes. Taxon. in press.**
- 2) **Melanie J. Patchell. 2013. Evolutionary developmental genetics of floral monosymmetry in *Cleome violacea* (Cleomaceae). M. Sc. Thesis, University of Alberta, Edmonton, Alberta.**
- 3) **Melanie J. Patchell, M.C. Bolton, P. Mankowski, and J.C. Hall. 2011. Comparative floral development in Cleomaceae reveals two distinct pathways leading to monosymmetry. International Journal of Plant Science 172 (3): 352-365.**
- 4) Peter E. Richard Graduate Student Conference Presentation 2011, University of Alberta. That doesn't look like mustard at all: evolution of floral monosymmetry in Cleomaceae.
- 5) Botanical Society of America, Providence, Rhode Island. (2010). Poster: Diverse patterns of early floral development in zygomorphic flowers of Cleomaceae reveal phylogenetic pattern.
- 6) BOT 600 lecture series presentation (2009): Breeding systems in rare plants: implications for survival.

TEACHING EXPERIENCE

1) Department of Biological Science Excellence in Graduate Student Teaching Award (2011) and Letter of Commendation for Teaching Excellence (2010).

2) Teaching Assistantships, University of Alberta:

BOT 322 Field Botany

BOT 205 Fundamentals of Plant Biology

BOT 306 Biology of the Fungi

EXECUTIVE AND PLANNING ROLES

1) SECRETARY ORGANIZATION OF BOTANY STUDENTS: Elected Secretary of student organization (2009-2012). Duties include registration of organization with student Groups Services, taking meeting minutes, and supervising elections. I've organized and lead the following events: Big Things Walk, River Valley Walk, Orchid Propagation Workshop, Growing Aquarium Plants Workshop, Venus Flytraps soccer and volleyball teams, Herbarium Friday Socials, and Club's Fair. I was also involved in reinstating the annual OBS Plant Sale.

2) UNIVERSITY OF ALBERTA MUSEUM OUTREACH PROGRAMS (2010-2011):

Science Sunday and Festival of Ideas.

Worked with Museum Outreach Coordinator, Stephanie Nemsok and Assistant Curator of the Vascular Plant Herbarium, Dorothy Fabijan, to design fun, educational activities that engage children with museum collections.

WORK EXPERIENCE

1) RARE PLANT CONSULTANT: Conducted rare plant surveys in Fort McMurray and Bonnyville.

Date(s): July 2012

Employer: Hired on contract by the Alberta Biodiversity Monitoring Institute

- Conducted rare plant surveys targeting species of concern for the Fort McMurray and Bonneyville area determined using the Alberta Conservation Information Management System (ACIMS) database.
- Identified difficult to identify specimens using technical literature.
- Assessed population size and stability for rare plants and submitted the corresponding Rare Native Plant Report Form to ACIMS.
- Used GPS, compass, and maps for navigation to sites on a daily basis.

2) FIELD TECHNICIAN ALBERTA BIODIVERSITY MONITORING INSTITUTE

(ABMI): Collecting biodiversity data at sites in LaCrete, Grande Prairie, Sundre, and Whitecourt.

Date(s): May-August 2008

Employer: Mr. Collin Twitchell, supervised by Mr. Greg Brooke and Mrs. Eleanor

Edye

Skills and experience gained:

- Conducted plant, bird, and mammal surveys in **Northern Alberta**, with an emphasis on plant identification, ecological site classification, and percent cover estimation.
- Collected vascular plant, moss, lichen, polypore fungi, and soil arthropod specimens for laboratory identification.
- Conducted recordings and point counts of breeding birds
- Used GPS, compass, and maps for navigation to sites on a daily basis.
- Routinely operated a one ton diesel truck with toploader and winch, 31 foot holiday trailer, quad with winch, and an inflatable boat to access sites.
- Worked in a field setting in all weather conditions for ten day shifts from May to the end of July.
- Identified and sorted moss specimens at the Royal Alberta Museum in August.

3) CLIMATE CHANGE AND HERBIVORY INTERACTIONS PROJECT

UNDERGRADUATE LABORATORY TECHNICIAN: Sample preparation and data entry.

Date(s): September-April 2007/2008

Employer: Dr. James Cahill, supervised by Mr. Bryon Shore

Institution: University of Alberta

Skills and experience gained:

- Identification of dried vegetation samples from Alberta grasslands and subsequent processing using mortar and pestle, sieves, and pressurized water.
- Entered data in Excel

4) FIELD TECHNICIAN ALBERTA BIODIVERSITY MONITORING INSTITUTE

(ABMI) - Collected biodiversity data at sites in Medicine Hat, Fort McLeod, Edmonton, and Consort.

Date(s): May-August 2007

Employer: Mr. Collin Twitchell, supervised by Mr. Chris Kolaczan and Ms. Eleanor Edye

Skills and experience gained:

- Conducted plant, bird, and mammal surveys in **Southern Alberta**, with an emphasis on plant identification, ecological site classification, and percent cover estimation.
- Collected vascular plant, moss, lichen, polypore fungi, and soil arthropod specimens for laboratory identification.
- Conducted recordings and point counts of breeding birds
- Used GPS, compass, and maps for navigation to sites on a daily basis
- Worked in a field setting in all weather conditions for ten day shifts from May to the end of July.

-
- Identified and sorted moss specimens at Meanook Biological Research Station in August.

CERTIFICATIONS

Valid Alberta Driver's License
Standard First Aid, CPR "C"
Restricted Marine Radio Certification
Pleasure Craft Operator Certification
Firearms Possession and Acquisition License
Defensive Driving (valid 2012-2014)
Bear Awareness (valid 2011-2013)
Workplace Hazardous Materials Information System (WHMIS) (valid 2011-2013)

RELEVANT SKILLS

Field Identification of common and rare Alberta plants.
Specimen collection and preparation for submission to herbariums
Consultation and request of material from herbariums (KEW and Missouri Botanical Garden)
Scanning electron microscopy (SEM)
DNA extraction from herbarium specimens
DNA amplification using Polymerase Chain Reaction
DNA sequencing and phylogenetic analysis
Standard procedures for working with RNA
In situ hybridization experiments
Presentation and communication of experimental results
Photography
Preparation of figures for publication (Illustrator and Photoshop)

APPENDIX 2. Results of Alberta Conservation Information Management System database search for rare plants and ecological communities near Lois Hole Centennial Provincial Park: TWP 53 RGE 25 MER 4 and TWP 53 RGE 26 MER 4.

Requestor: Consultant						Date: 4/8/2013
Reason for Request: Protected Area Information						
SEC: -- TWP: 053 RGE: 25 MER: 4						
Table of Results						
<input checked="" type="checkbox"/> Sensitive EOs: 0 (Data Updated: November 2012)						
M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - FAQs #13						
<input type="checkbox"/> Non-sensitive EOs: 20 (Data Updated: November 2012)						
M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
4-25-053-20	18949	PDASTE022	S2	Doellingeria umbellata var. pubens	flat-topped white aster	8/29/2003
4-25-053-20	18950	PDASTE022	S2	Doellingeria umbellata var. pubens	flat-topped white aster	8/29/2003
4-25-053-19	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-25-053-29	20178	PDAP11K060	S2	Osmorhiza longistylis	smooth sweet cicely	6/30/2010
4-25-053-29	18965	PMPOT030B0	S2	Potamogeton foliosus	leafy pondweed	8/4/2005
4-25-053-01	13540	PMPOA481D0	S2	Muhlenbergia racemosa	marsh muhly	9/3/1968
4-25-053-35	18819	PDAP11K060	S2	Osmorhiza longistylis	smooth sweet cicely	6/12/2006
4-25-053-01	6725	PDAP11K060	S2	Osmorhiza longistylis	smooth sweet cicely	8/15/1968
4-25-053-01	13190	PMPOA151M0	S1	Bromus latiglumis	Canada brome	8/2/1944
4-25-053-30	20177	PDAP11K060	S2	Osmorhiza longistylis	smooth sweet cicely	6/30/2010
4-25-053-30	18605	CEAB000043	S1S2	Populus balsamifera / Viburnum opulus / Matteuccia struthiopteris	balsam poplar / high-bush cranberry / ostrich fern	9/6/2008
4-25-053-30	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-25-053-30	17983	NBMUS48040	S1	Leskea polycarpa	moss	9/6/2008

4-25-053-29	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-25-053-30	20176	PDAPI1K060	S2	Osmorhiza longistylis	smooth sweet cicely	6/30/2010
4-25-053-34	18821	PDASTEHO22	S2	Doellingeria umbellata var. pubens	flat-topped white aster	6/14/2006
4-25-053-32	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-25-053-29	18605	CEAB000043	S1S2	Populus balsamifera / Viburnum opulus / Matteuccia struthiopteris	balsam poplar / high-bush cranberry / ostrich fern	9/6/2008
4-25-053-31	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-25-053-32	18965	PMPOT030B0	S2	Potamogeton foliosus	leafy pondweed	8/4/2005

Next Steps: [FAQs #13](#)

■ PPA: 11 (Data Updated: Jan. 2011)

M-RR-TTT-SS	Park Name	Type	IUCN
4-25-053-31	Lois Hole Centennial	PP	//
4-25-053-31	Lois Hole Centennial	PP	//
4-25-053-32	Lois Hole Centennial	PP	//
4-25-053-32	Lois Hole Centennial	PP	//
4-25-053-20	Lois Hole Centennial	PP	//
4-25-053-29	Lois Hole Centennial	PP	//
4-25-053-19	Lois Hole Centennial	PP	//
4-25-053-19	Lois Hole Centennial	PP	//
4-25-053-30	Lois Hole Centennial	PP	//
4-25-053-30	Lois Hole Centennial	PP	//
4-25-053-29	Lois Hole Centennial	PP	//

Next Steps: [E-mail Parks](#) or [FAQs #14](#)

Data Note:

■ Sensitive EOs: Data is generalized to the Township level. Information about EOs in a specific Section within the Township must be requested.

■ PPA: A 100m buffer has been placed around all Protected Areas.

Requestor: Consultant

Date: 4/8/2013

Reason for Request: Protected Area Information

SEC: - TWP: 053 RGE: 26 MER: 4

Table of Results

 Sensitive EOs: 0 (Data Updated: November 2012)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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No Sensitive EOs Found: Next Steps - FAQs #13

 Non-sensitive EOs: 42 (Data Updated: November 2012)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
4-26-053-07	5778	NLT0029890	S1S3	Trapeliopsis flexuosa	mottled-disk lichen	9/5/1985
4-26-053-07	21032	NLT0012890	S2S4	Lecania dubitans	bean-spored rim-lichen	9/5/1985
4-26-053-07	5854	NLT0032060	S2S4	Xylographa parallela	black woodscript lichen	9/25/1985
4-26-053-08	21032	NLT0012890	S2S4	Lecania dubitans	bean-spored rim-lichen	9/5/1985
4-26-053-08	7618	PDASTEHO22	S2	Doellingeria umbellata var. pubens	flat-topped white aster	8/8/1991
4-26-053-08	4919	NBMUS93020	SU	Limprichtia cossonii	moss	6/24/1958
4-26-053-07	12996	PMORC1R070	S1	Malaxis paludosa	bog adder's-mouth	7/22/1997
4-26-053-07	3601	NBMUS2J020	S2	Drepanocladus crassicosatus	brown moss	10/26/1989
4-26-053-07	4919	NBMUS93020	SU	Limprichtia cossonii	moss	6/24/1958
4-26-053-07	5438	NLT0013720	S2	Lecanora hybocarpa	bumpy rim-lichen	9/5/1985
4-26-053-07	12398	PMCYP0N070	S1	Rhynchospora capillacea	slender beak-rush	7/22/1997
4-26-053-27	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-26-053-25	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-26-053-08	12342	PMCYP090K0	S2?	Eleocharis elliptica	slender spikerush	7/6/1991

4-26-053-28	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-26-053-07	12342	PMCYP090K0	S2?	Eleocharis elliptica	slender spikerush	7/6/1991
4-26-053-07	2530	NBHEP2Y030	S2	Riccardia latifrons	liverwort	9/14/1978
4-26-053-07	2535	NBHEP2Y040	S2S3	Riccardia multifida	liverwort	8/9/1961
4-26-053-06	21032	NLT0012890	S2S4	Lecanora dubitans	bean-spored rim-lichen	9/5/1985
4-26-053-06	21034	NLT0013305	S1	Lecanora caesiorubella ssp. saximontana	frosted rim-lichen	9/5/1986
4-26-053-07	3281	NBMUS1J070	S2	Campyllum radicale	campyllum moss	9/14/1978
4-26-053-07	3396	NBMUS25010	S1	Desmatodon cernuus	narrow-leafed chain-teeth moss	9/14/1978
4-26-053-07	2679	NBMUS05010	S2	Amblyodon dealbatus	moss	8/8/1984
4-26-053-07	2994	NBMUS0Z0L0	S2	Brachythecium plumosum	moss	9/14/1978
4-26-053-08	3396	NBMUS25010	S1	Desmatodon cernuus	narrow-leafed chain-teeth moss	9/14/1978
4-26-053-08	3281	NBMUS1J070	S2	Campyllum radicale	campyllum moss	9/14/1978
4-26-053-08	12398	PMCYP0N070	S1	Rhynchospora capillacea	slender beak-rush	7/22/1997
4-26-053-08	2679	NBMUS05010	S2	Amblyodon dealbatus	moss	8/8/1984
4-26-053-08	2994	NBMUS0Z0L0	S2	Brachythecium plumosum	moss	9/14/1978
4-26-053-13	12347	PMCYP090K0	S2?	Eleocharis elliptica	slender spikerush	6/29/2002
4-26-053-15	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-26-053-08	7231	PDAST3P140	S1S2	Eupatorium maculatum	spotted Joe-pye weed	1990-06-XX
4-26-053-08	21034	NLT0013305	S1	Lecanora caesiorubella ssp. saximontana	frosted rim-lichen	9/5/1986
4-26-053-22	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX

4-26-053-23	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-26-053-18	3031	NBMUS0Z0R0	S2?	Brachythecium rutabulum	moss	10/25/1968
4-26-053-24	22912	IMGASM7010	S3	Menetus opercularis	Button Sprite	2001-XX-XX
4-26-053-24	12347	PMCYP090K0	S2?	Eleocharis elliptica	slender spikerush	6/29/2002
4-26-053-07	21034	NLT0013305	S1	Lecanora caesiorubella ssp. saximontana	frosted rim-lichen	9/5/1986
4-26-053-08	2535	NBHEP2Y040	S2S3	Riccardia multifida	liverwort	8/9/1961
4-26-053-17	7238	PDAST3P140	S1S2	Eupatorium maculatum	spotted Joe-pye weed	8/21/1999
4-26-053-08	2530	NBHEP2Y030	S2	Riccardia latifrons	liverwort	9/14/1978

Next Steps: [CADs #13](#)

■ PPA: 37 (Data Updated: Jan. 2011)

M-RR-TTT-SS	Park Name	Type	IUCN
4-26-053-26	Lois Hole Centennial	PP	II
4-26-053-27	Lois Hole Centennial	PP	II
4-26-053-25	Lois Hole Centennial	PP	II
4-26-053-28	Lois Hole Centennial	PP	II
4-26-053-27	Lois Hole Centennial	PP	II
4-26-053-25	Lois Hole Centennial	PP	II
4-26-053-24	Lois Hole Centennial	PP	II
4-26-053-28	Lois Hole Centennial	PP	II
4-26-053-29	Lois Hole Centennial	PP	II
4-26-053-20	Lois Hole Centennial	PP	II
4-26-053-19	Lois Hole Centennial	PP	II
4-26-053-21	Lois Hole Centennial	PP	II
4-26-053-20	Lois Hole Centennial	PP	II
4-26-053-17	Lois Hole Centennial	PP	II
4-26-053-16	Lois Hole Centennial	PP	II
4-26-053-18	Wagner	NA	III
4-26-053-22	Lois Hole Centennial	PP	II

4-26-053-22	Lois Hole Centennial	PP	//
4-26-053-21	Lois Hole Centennial	PP	//
4-26-053-23	Lois Hole Centennial	PP	//
4-26-053-24	Lois Hole Centennial	PP	//
4-26-053-23	Lois Hole Centennial	PP	//
4-26-053-07	Wagner	NA	///
4-26-053-07	Wagner	NA	///
4-26-053-08	Wagner	NA	///
4-26-053-06	Wagner	NA	///
4-26-053-05	Wagner	NA	///
4-26-053-06	Wagner	NA	///
4-26-053-15	Lois Hole Centennial	PP	//
4-26-053-15	Lois Hole Centennial	PP	//
4-26-053-16	Lois Hole Centennial	PP	//
4-26-053-14	Lois Hole Centennial	PP	//
4-26-053-08	Wagner	NA	///
4-26-053-14	Lois Hole Centennial	PP	//
4-26-053-30	Lois Hole Centennial	PP	//
4-26-053-30	Lois Hole Centennial	PP	//
4-26-053-29	Lois Hole Centennial	PP	//

Next Steps: [E-mail Parks](#) or [FAQs #14](#)

Data Note:

- **Sensitive EOs:** Data is generalized to the Township level. Information about EOs in a specific Section within the Township must be requested.
- **PPA:** A 100m buffer has been placed around all Protected Areas.

APPENDIX 3. Species inventory: species names and collection information for species detected in Lois Hole Centennial Provincial Park. Common names listed as used in local tradition. Latin names are listed from both the Moss Flora of Alberta, 2nd Edition and current Integrated Taxonomic Information System (ITIS) searches. Abundance is based on observations made during survey of 50x50m plots and plotless surveys. Absence of data is indicated by "--".

Full Latin Name (Moss 1994)	Full Latin Name (current 2013)	Family	Origin	Abundance	Habitat	Common Name
Aquatic Plants						
<i>Acorus americanus</i> (Raf.) Raf.	<i>Acorus americanus</i> (Raf.) Raf.	Araceae (Arum Family)	Native	Common	Shallow water at margin of lake and ponds.	Sweetflag
<i>Alisma plantago- aquatica</i> L.	<i>Alisma plantago- aquatica</i> L.	Alismataceae (Water-plantain Family)	Native	Occasional	Moist, open areas and ditches.	Broad-leaved Water- plantain
<i>Callitriche verna</i> L.	<i>Callitriche palustris</i> L.	Callitrichaceae (Water Starwort Family)	Native	Occasional	Exposed mud along lake and stream margins.	Vernal Water-starwort
<i>Carex aquatilis</i> Wahlenb.	<i>Carex aquatilis</i> Wahlenb.	Cyperaceae (Sedge Family)	Native	Common	Saturated soil and shallow water.	Water Sedge
<i>Carex atherodes</i> Spreng.	<i>Carex atherodes</i> Spreng.	Cyperaceae (Sedge Family)	Native	Common	Saturated, open areas and shallow water.	Slough Sedge
<i>Carex rostrata</i> Stokes	<i>Carex utriculata</i> Boott	Cyperaceae (Sedge Family)	Native	Common	Saturated, open areas and shallow water.	Bottle Sedge
<i>Ceratophyllum demersum</i>	<i>Ceratophyllum demersum</i> L.	Ceratophyllaceae (Hornwort Family)	Native	Common	Shallow water of streams and lake.	Hornwort; Coon's Tail
<i>Eleocharis acicularis</i> (L.) R. & S.	<i>Eleocharis acicularis</i> (L.) R. & S.	Cyperaceae (Sedge Family)	Native	Uncommon	Disturbed wet areas, including old quad trails along shore of lake.	Needle Spikerush
<i>Eleocharis palustris</i> (L.) R. & S.	<i>Eleocharis acicularis</i> (L.) R. & S.	Cyperaceae (Sedge Family)	Native	Common	Shallow water at lake shore.	Common Spikerush
<i>Equisetum fluviatile</i> L.	<i>Equisetum fluviatile</i> L.	Equisetaceae (Horsetail Family)	Native	Occasional	Shallow water at margin of lake.	Water Horsetail
<i>Lemna minor</i> L.	<i>Lemna minor</i> L.	Lemnaceae (Duckweed Family)	Native	Common	Floating on surface of quiet water.	Common Duckweed

<i>Lemna trisulca</i> L.	<i>Lemna trisulca</i> L.	Lemnaceae (Duckweed Family)	Native	Common	Suspended near surface of water column.	Ivy Duckweed
<i>Myriophyllum exallescens</i> Fern.	<i>Myriophyllum sibiricum</i> Kom.	Haloragaceae (Water-milfoil Family)	Native	Occasional	Water of streams and lake.	Northern Watermilfoil
<i>Potamogeton alpinus</i> Balbis.	<i>Potamogeton alpinus</i> Balbis.	Potamogetonaceae (Pondweed Family)	Native	Uncommon	Shallow water of Big Lake.	Alpine Pondweed
<i>Potamogeton natans</i> L.	<i>Potamogeton natans</i> L.	Potamogetonaceae (Pondweed Family)	Native	Occasional	Shallow water at lake shore.	Floatingleaf Pondweed
<i>Potamogeton pectinatus</i> L.	<i>Stuckenia pectinata</i> (L.) Borner	Potamogetonaceae (Pondweed Family)	Native	Dominant	Shallow water of Big Lake.	Sago Pondweed
<i>Potamogeton pusillus</i> L.	<i>Potamogeton pusillus</i> L.	Potamogetonaceae (Pondweed Family)	Native	Uncommon	Shallow water of Big Lake.	Small Pondweed
<i>Potamogeton richardsonii</i> (Benn.) Rydb.	<i>Potamogeton richardsonii</i> (Benn.) Rydb.	Potamogetonaceae (Pondweed Family)	Native	Occasional	Shallow water of Big Lake.	Richardson's Pondweed
<i>Sagittaria cuneata</i> Sheld.	<i>Sagittaria cuneata</i> Sheld.	Alismataceae (Water-plantain Family)	Native	Uncommon	Shallow water at lake shore.	Arrowhead
<i>Scirpus acutus</i> Muhl. ex. Bigel.	<i>Schoenoplectus acutus</i> (Muhl. ex Bigel) A. Love & D. Love	Cyperaceae (Sedge Family)	Native	Common	Shallow, calm water.	Hardstem Bulrush
<i>Scirpus fluviatilis</i> (Torr.) A. Gray	<i>Bulboschoenus fluviatilis</i> (Torr.) J. Sojak	Cyperaceae (Sedge Family)	Native	Locally abundant	Shallow, calm water.	River Bulrush
<i>Scirpus validus</i> Vahl	<i>Schoenoplectus tabernaemontani</i> (C.C. Gmel.) Palla	Cyperaceae (Sedge Family)	Native	Common	Saturated, open areas and shallow water.	Softstem Bulrush
<i>Sparganium eurycarpum</i> Engelm.	<i>Sparganium eurycarpum</i> Engelm.	Sparganiaceae (Bur-reed Family)	Native	Common	Shallow water near lake margin.	Giant Bur-reed
<i>Spirodella polyrhiza</i> (L.) Schleiden	<i>Spirodella polyrhiza</i> (L.) Schleiden	Lemnaceae (Duckweed Family)	Native	Common	Floating on surface of quiet water.	Giant Duckweed

<i>Typha latifolia</i> L.	<i>Typha latifolia</i> L.	Typhaceae (Cattail Family)	Native	Common	Shallow, calm water.	Cattail
<i>Utricularia vulgaris</i> L.	<i>Utricularia vulgaris</i> L.	Lentibulariaceae (Bladderwort Family)	Native	Common	Shallow water of lake margin and ditches.	Bladderwort
<i>Zannichellia palustris</i> L.	<i>Zannichellia palustris</i> L.	Zannichelliaceae (Horned Pondweed Family)	Native	Occasional	Shallow water.	Horned Pondweed
Ferns						
<i>Botrychium virginianum</i> (L.) Sw.	<i>Botrychium virginianum</i> (L.) Sw.	Ophioglossaceae (Adder's-tongue Family)	Native	Occasional	Moist forest.	Grape Fern
<i>Dryopteris carthusiana</i> (Vill.) H. P. Fuchs	<i>Dryopteris carthusiana</i> (Vill.) H. P. Fuchs	Polypodiaceae (Fern Family)	Native	Occasional	Damp woods in southeast corner of park.	Narrow Spinulose Shield Fern
<i>Matteuccia struthiopteris</i> (L.) Torado	<i>Matteuccia struthiopteris</i> (L.) Torado	Polypodiaceae (Fern Family)	Native	Locally abundant	Damp woods in southeast corner of park.	Ostrich Fern
Grass-like Plants						
<i>Agropyron trachycaulum</i> (Link) Malte	<i>Elymus trachycaulus</i> (Link) Gould ex Shinnars	Poaceae (Grass Family)	Native	Common	Open forests and meadows.	Slender Wheatgrass
<i>Agropyron repens</i> (L) Beauv.	<i>Elymus repens</i> (L.) Gould	Poaceae (Grass Family)	Introduced	Common	Lake margin and moist open areas.	Quack Grass
<i>Alopecurus aequalis</i> Sobol.	<i>Alopecurus aequalis</i> Sobol.	Poaceae (Grass Family)	Native	Occasional	Moist meadows and open areas of lakeshore.	Water Foxtail
<i>Alopecurus pratensis</i> L.	<i>Alopecurus pratensis</i> L.	Poaceae (Grass Family)	Introduced	Occasional	Moist meadows.	Meadow Foxtail
<i>Avena fatua</i> L.	<i>Avena fatua</i> L.	Poaceae (Grass Family)	Introduced	Uncommon	Disturbed ground of roadsides and well pads.	Wild Oats
<i>Beckmannia syzigachne</i> (Steud.) Fern	<i>Beckmannia syzigachne</i> (Steud.) Fern	Poaceae (Grass Family)	Native	Common	Moist lake shore and ditches.	Slough Grass
<i>Bromus ciliatus</i> L.	<i>Bromus ciliatus</i> L.	Poaceae (Grass Family)	Native	Occasional	Disturbed soil in moist forest, including margins of trails.	Fringed Brome

<i>Bromus inermis</i> Leys.	<i>Bromus inermis</i> Leys.	Poaceae (Grass Family)	Introduced	Common	Open upland habitats, including trail margins.	Smooth Brome
<i>Calamagrostis canadensis</i> (Michx.) Beauv.	<i>Calamagrostis canadensis</i> (Michx.) Beauv.	Poaceae (Grass Family)	Native	Common	Upland woods and field margins.	Bluejoint; Marsh Reed Grass
<i>Calamagrostis inexpansa</i> A. Gray	<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i> (A. Gray) C. W. Greene	Poaceae (Grass Family)	Native	Common	Lake shore.	Northern Reed Grass
<i>Carex deweyana</i> Schwein.	<i>Carex deweyana</i> Schwein.	Cyperaceae (Sedge Family)	Native	Occasional	Moist forest.	Deweys' Sedge
<i>Carex disperma</i> Dewey	<i>Carex disperma</i> Dewey	Cyperaceae (Sedge Family)	Native	Common	Moist, shady forest.	Two-seeded Sedge; Softleaved Sedge
<i>Carex praegracilis</i> W. Boott	<i>Carex praegracilis</i> W. Boott	Cyperaceae (Sedge Family)	Native	Frequent	Moist meadows and lakeshore.	Graceful Field Sedge
<i>Carex retrorsa</i> Schwein.	<i>Carex retrorsa</i> Schwein.	Cyperaceae (Sedge Family)	Native	Occasional	Swampy woods and margin of beaver trails.	Retrorse Sedge
<i>Carex sartwellii</i> Dewey	<i>Carex sartwellii</i> Dewey	Cyperaceae (Sedge Family)	Native	Occasional	Moist meadows.	Sartwells's Sedge
<i>Carex sychnocephala</i> Carey	<i>Carex sychnocephala</i> Carey	Cyperaceae (Sedge Family)	Native	Occasional	Open lakeshore and floating logs.	Many-headed Sedge
<i>Cinna latifolia</i> (Trev.) Giseb.	<i>Cinna latifolia</i> (Trev.) Giseb.	Poaceae (Grass Family)	Native	Locally abundant	Moist woods in southeast corner of park.	Drooping Wood Reed
<i>Echinochloa crus-galli</i> (L.) Beauv.	<i>Echinochloa crus-galli</i> (L.) Beauv.	Poaceae (Grass Family)	Introduced	Occasional	Roadsides and well pads.	Barnyard Grass
<i>Glyceria striata</i> (Lam.) A.S. Hitchc.	<i>Glyceria striata</i> (Lam.) A.S. Hitchc.	Poaceae (Grass Family)	Native	Occasional	Moist meadows and lakeshore.	Fowl Manna Grass
<i>Hierochloa odorata</i> (L.) Beauv.	<i>Hierochloa odorata</i> (L.) Beauv.	Poaceae (Grass Family)	Native	Occasional	Open areas near roadsides.	Sweetgrass
<i>Hordeum jubatum</i> L.	<i>Hordeum jubatum</i> L.	Poaceae (Grass Family)	Introduced	Occasional	Roadsides and well pads.	Foxtail Barley
<i>Phalaris arundinacea</i> L.	<i>Phalaris arundinacea</i> L.	Poaceae (Grass Family)	Native	Dominant	Saturated, open areas and shallow water.	Reed Canary Grass

<i>Phleum pratense</i> L.	<i>Phleum pratense</i> L.	Poaceae (Grass Family)	Introduced	Occasional	Meadows and open areas.	Timothy
<i>Poa annua</i> L.	<i>Poa annua</i> L.	Poaceae (Grass Family)	Introduced	Occasional	Disturbed ground of roadsides and well pads.	Annual Bluegrass
<i>Poa palustris</i> L.	<i>Poa palustris</i> L.	Poaceae (Grass Family)	Native	Common	Moist woods and meadows.	Fowl Bluegrass
<i>Poa pratensis</i> L.	<i>Poa pratensis</i> L.	Poaceae (Grass Family)	Native	Common	Open woods and meadows.	Kentucky Bluegrass
<i>Schizachne purpurascens</i> (Torr.) Swallen	<i>Schizachne purpurascens</i> (Torr.) Swallen	Poaceae (Grass Family)	Native	Common	Moist woods.	False Melic
<i>Scolochloa festucacea</i> (Willd.) Link	<i>Scolochloa festucacea</i> (Willd.) Link	Poaceae (Grass Family)	Native	Frequent	Moist ground.	Common Rivergrass
Shrubs						
<i>Alnus crispa</i> (Ait.) Pursh	<i>Alnus viridis</i> subsp. <i>crispa</i> (Ait.) Pursh	Betulaceae (Birch Family)	Native	Occasional	Moist forest and lake shore.	Green Alder
<i>Alnus tenuifolia</i> Nutt.	<i>Alnus incana</i> subsp. <i>tenuifolia</i> Nutt.	Betulaceae (Birch Family)	Native	Occasional	Moist forest, stream and lake shore.	River Alder
<i>Amelanchier alnifolia</i> Medic.	<i>Amelanchier alnifolia</i> Medic.	Rosaceae (Rose Family)	Native	Common	Hillsides and open forest.	Saskatoon; Service Berry
<i>Cornus stolonifera</i> Michx.	<i>Cornus sericea</i> L.	Cornaceae (Dogwood Family)	Native	Common	Open woods.	Red Osier Dogwood
<i>Corylus cornuta</i> Marsh.	<i>Corylus cornuta</i> Marsh.	Betulaceae (Birch Family)	Native	Common	Forests.	Beaked Hazelnut
<i>Cotoneaster lucidus</i> Schltld.	<i>Cotoneaster lucidus</i> Schltld.	Rosaceae (Rose Family)	Introduced	Occasional	Moist woods.	Cotoneaster
<i>Lonicera dioica</i> L.	<i>Lonicera dioica</i> L.	Caprifoliaceae (Honeysuckle Family)	Native	Common.	Forests.	Twining Honeysuckle
<i>Lonicera involucrata</i> (Richards.) Banks	<i>Lonicera involucrata</i> (Richards.) Banks	Caprifoliaceae	Native	Common	Forests.	Bracted Honeysuckle
<i>Prunus pensylvanica</i> L.f.	<i>Prunus pensylvanica</i> L.f.	Rosaceae (Rose Family)	Native	Common	Open woods and clearings.	Pin Cherry
<i>Prunus virginiana</i> L.	<i>Prunus virginiana</i> L.	Rosaceae (Rose Family)	Native	Occasional	Open woods and clearings.	Choke Cherry

<i>Ribes americanum</i> Mill.	<i>Ribes americanum</i> Mill.	Grossulariaceae (Gooseberry Family)	Native	Common	Moist woods around lake margin.	Wild Black Currant
<i>Ribes glandulosum</i> Grauer	<i>Ribes glandulosum</i> Grauer	Grossulariaceae (Gooseberry Family)	Native	Occasional	Moist forests.	Skunk Currant
<i>Ribes hudsonianum</i> Richards.	<i>Ribes hudsonianum</i> Richards.	Grossulariaceae (Gooseberry Family)	Native	Occasional	Moist woods and willow thickets.	Wild Black Currant
<i>Ribes oxycanthoides</i> L.	<i>Ribes oxycanthoides</i> L.	Grossulariaceae (Gooseberry Family)	Native	Occasional	Open forests and meadows.	Wild Gooseberry
<i>Ribes triste</i> Pall.	<i>Ribes triste</i> Pall.	Grossulariaceae (Gooseberry Family)	Native	Occasional	Open forests.	Wild Red Currant
<i>Rosa acicularis</i> Lindl.	<i>Rosa acicularis</i> Lindl.	Rosaceae (Rose Family)	Native	Common	Open woods.	Prickly Rose
<i>Rosa woodsii</i> Lindl.	<i>Rosa woodsii</i> Lindl.	Rosaceae (Rose Family)	Native	Occasional	Open woods and clearings.	Common Wild Rose
<i>Rubus idaeus</i> L.	<i>Rubus idaeus</i> L.	Rosaceae (Rose Family)	Native	Common	Open forests.	Wild Red Raspberry
<i>Salix bebbiana</i> Sarg.	<i>Salix bebbiana</i> Sarg.	Salicaceae (Willow Family)	Native	Common	Moist forest and lake margin.	Bebb's Willow
<i>Salix candida</i> Gluegge ex Willd.	<i>Salix candida</i> Gluegge ex Willd.	Salicaceae (Willow Family)	Native	Occasional	Wet meadows in southwestern areas of park.	Sageleaf Willow
<i>Salix discolor</i> Muhl.	<i>Salix discolor</i> Muhl.	Salicaceae (Willow Family)	Native	Common	Moist forest and lake margin.	Pussy Willow
<i>Salix exigua</i> Nutt.	<i>Salix exigua</i> Nutt.	Salicaceae (Willow Family)	Native	Common	Open areas near lake margin.	Sandbar Willow
<i>Salix lucida</i> Muhl.	<i>Salix lucida</i> Muhl.	Salicaceae (Willow Family)	--	Occasional	Moist woods	Shining Willow
<i>Salix maccalliana</i> Rowlee	<i>Salix maccalliana</i> Rowlee	Salicaceae (Willow Family)	Native	Occasional	Moist thickets near lake margin.	McCalla's Willow
<i>Salix maccalliana</i> Rowlee.	<i>Salix maccalliana</i> Rowlee.	Salicaceae (Willow Family)	Native	Occasional	Wet meadows in southwestern areas of park.	McCalla's Willow

<i>Salix petiolaris</i> J. E. Smith	<i>Salix petiolaris</i> J. E. Smith	Salicaceae (Willow Family)	Native	Dominant	Lake margin, deltas, and sedge meadows.	Meadow Willow
<i>Salix pseudomonticola</i> Ball.	<i>Salix pseudomonticola</i> Ball.	Salicaceae (Willow Family)	Native	Occasional	Lake shore and moist, open woods.	White Mountain Willow
<i>Sambucus racemosa</i> L.	<i>Sambucus racemosa</i> L.	Caprifoliaceae (Honeysuckle Family)	Native	Occasional	Open, upland areas.	Red Elderberry
<i>Shepherdia canadensis</i> (L.) Nutt.	<i>Shepherdia canadensis</i> (L.) Nutt.	Elaeagnaceae (Oleaster Family)	Native	Common	Open forest.	Canadian Buffalo Berry
<i>Sorbus aucuparia</i> L.	<i>Sorbus aucuparia</i> L.	Rosaceae (Rose Family)	Introduced	Occasional	Moist woods.	European Mountain Ash
<i>Sorbus scopulina</i> Greene	<i>Sorbus scopulina</i> Greene	Rosaceae (Rose Family)	Native	Locally abundant	Moist woods.	Western Mountain Ash
<i>Symphoricarpos albus</i> (L.) Blake	<i>Symphoricarpos albus</i> (L.) Blake	Caprifoliaceae (Honeysuckle Family)	Native	Common	Forests.	Snowberry
<i>Symphoricarpos occidentalis</i> Hook	<i>Symphoricarpos occidentalis</i> Hook	Caprifoliaceae (Honeysuckle Family)	Native	Common	Open forests and thickets.	Buckbrush
<i>Viburnum edule</i> (Michx.) Raf.	<i>Viburnum edule</i> (Michx.) Raf.	Caprifoliaceae (Honeysuckle Family)	Native	Locally Abundant	Moist woods.	Lowbush Cranberry
<i>Viburnum opulus</i> L.	<i>Viburnum opulus</i> L.	Caprifoliaceae (Honeysuckle Family)	Native	Locally Abundant	Moist woods.	Highbush Cranberry
Trees						
<i>Acer negundo</i> L.	<i>Acer negundo</i> L.	Aceraceae (Maple Family)	Native/ Introduced	Common	Moist woods and lake shore.	Manitoba Maple
<i>Betula neoalaskana</i> Sargent	<i>Betula neoalaskana</i> Sargent	Betulaceae (Birch Family)	Native	Occasional	Open forests.	Alaskan Birch
<i>Betula papyrifera</i> Marsh.	<i>Betula papyrifera</i> Marsh.	Betulaceae (Birch Family)	Native	Common	Upland lake shore.	Paper Birch
<i>Fraxinus pennsylvanica</i> Marsh.	<i>Fraxinus pennsylvanica</i> Marsh.	Oleaceae (Olive Family)	Introduced	Uncommon	Margin of forests.	Green Ash

<i>Picea glauca</i> (Moench) Voss	<i>Picea glauca</i> (Moench) Voss	Pinaceae (Pine Family)	Native	Common	Upland areas.	White Spruce
<i>Picea mariana</i> (Mill.) BSP.	<i>Picea mariana</i> (Mill.) BSP.	Pinaceae (Pine Family)	Native	Occasional	Moist forest.	Black Spruce
<i>Populus balsamifera</i> L.	<i>Populus balsamifera</i> L.	Salicaceae (Willow Family)	Native	Dominant	Moist upland lake shore.	Balsam Poplar
<i>Populus tremuloides</i> Michx.	<i>Populus tremuloides</i> Michx.	Salicaceae (Willow Family)	Native	Common	Upland lake shore, often mixed with Balsam Poplar.	Trembling Aspen.
Forbs						
<i>Achillea millefolium</i> L.	<i>Achillea millefolium</i> L.	Asteraceae (Aster Family)	Native	Common	Upland habitats.	Yarrow
<i>Achillea sibirica</i> Ledeb.	<i>Achillea alpina</i> L.	Asteraceae (Aster Family)	Native	Occasional	Moist woods.	Siberian Yarrow
<i>Actaea rubra</i> (Ait.) Willd.	<i>Actaea rubra</i> (Ait.) Willd.	Ranunculaceae (Buttercup Family)	Native	Common	Forests.	Baneberry
<i>Adoxa moschatellina</i> L.	<i>Adoxa moschatellina</i> L.	Adoxaceae (Moschatel Family)	Native	Locally abundant	Moist woods.	Moschatel
<i>Agastache foeniculum</i> (Pursh) Ktze.	<i>Agastache foeniculum</i> (Pursh) Ktze.	Lamiaceae (Mint Family)	Native	Occasional	Open areas in moist woods.	Giant Hyssop
<i>Agrimonia striata</i> Michx.	<i>Agrimonia striata</i> Michx.	Rosaceae (Rose Family)	Native	Common	Disturbed soil in moist forest, including margins of trails.	Agrimony
<i>Anemone canadensis</i> L.	<i>Anemone canadensis</i> L.	Ranunculaceae (Buttercup Family)	Native	Common	Moist forests and meadows.	Canada Anemone
<i>Anemone riparia</i> Fern.	<i>Anemone virginiana</i> var. <i>alba</i> (Oakes) Alph. Wood	Ranunculaceae (Buttercup Family)	Native	Occasional	Stream margins in shady forest.	Thimbleweed
<i>Aralia nudicaulis</i> L.	<i>Aralia nudicaulis</i> L.	Araliaceae (Ginseng Family)	Native	Common	Upland forests.	Wild Sarsaparilla
<i>Artemisia biennis</i> Willd.	<i>Artemisia biennis</i> Willd.	Asteraceae (Aster Family)	Native	Occasional	Moist ground in disturbed areas.	Biennial Sagewort

<i>Aster brachyactis</i> Blake	<i>Symphiotrichum ciliatum</i> (Ledeb.) G.L. Nesom	Asteraceae (Aster Family)	Introduced	Occasional	Moist open areas near lake shore.	Rayless Aster
<i>Aster ciliolatus</i> Lindl.	<i>Symphiotrichum ciliolatum</i> Lindl.	Asteraceae (Aster Family)	Native	Common	Upland woods and meadows.	Lindley's Aster
<i>Aster conspicuus</i> Lindl.	<i>Eurybia conspicua</i> (Lindl.) G.L. Nesom	Asteraceae (Aster Family)	Native	Common	Upland woods.	Showy Aster
<i>Aster hesperius</i> A. Gray	<i>Symphiotrichum lanceolatum</i> (Willd.) G.L. Nesom subsp. <i>hesperium</i> (A. Gray) G.L. Nesom	Asteraceae (Aster Family)	Native	Common	Open areas and ditches.	Western Willow Aster
<i>Aster puniceus</i> L.	<i>Symphiotrichum puniceum</i> (L.) A. Love & D. Love var. <i>puniceum</i>	Asteraceae (Aster Family)	Native	Common	Moist woods.	Purple-stemmed Aster
<i>Bidens cernua</i> L.	<i>Bidens cernua</i> L.	Asteraceae (Aster Family)	Native	Occasional	Open areas of lake shore and floating logs.	Nodding Beggar-ticks
<i>Caltha palustris</i> L.	<i>Caltha palustris</i> L.	Ranunculaceae (Buttercup Family)	Native	Occasional	Moist thickets near flowing water.	Marsh Marigold
<i>Caragana arborescens</i> Lam.	<i>Caragana arborescens</i> Lam.	Fabaceae (Pea Family)	Introduced	Occasional	Open forests.	Caragana
<i>Cardamine pennsylvanica</i> Muhl. ex Willd	<i>Cardamine pennsylvanica</i> Muhl. ex Willd	Brassicaceae (Mustard Family)	Native	Occasional	Wet ground along streams.	Pennsylvania Bittercress
<i>Chenopodium album</i> L.	<i>Chenopodium album</i> L.	Chenopodiaceae (Goosefoot Family)	Introduced	Rare	Disturbed ground in upland habitats.	Lamb's Quarters
<i>Chenopodium salinum</i> Stand.	<i>Chenopodium glaucum</i> var. <i>salinum</i> (Stand.) B. Boivin	Chenopodiaceae (Goosefoot Family)	Native	Occasional	Moist lakeshore.	Oak-leaved Goosefoot

<i>Chrysosplenium iowense</i> Rydb.	<i>Chrysosplenium iowense</i> Rydb.	Saxifragaceae (Saxifrage Family)	Native	Rare	Shady, moist stream banks.	Golden Saxifrage
<i>Cicuta bulbifera</i> L.	<i>Cicuta bulbifera</i> L.	Apiaceae (Carrot Family)	Native	Occasional	Swamps.	Bulblet-bearing Water Hemlock
<i>Cicuta maculata</i> L. var. <i>angustifolia</i>	<i>Cicuta maculata</i> L. var. <i>angustifolia</i>	Apiaceae (Carrot Family)	Native	Common	Saturated soil at lake margin and moist depressions.	Spotted Water Hemlock
<i>Circaea alpina</i> L.	<i>Circaea alpina</i> L.	Onagraceae (Evening Primrose Family)	Native	Locally abundant	Damp woods in southeast corner of park.	Enchanter's Nightshade
<i>Circaea alpina</i> L.	<i>Circaea alpina</i> L.	Onagraceae (Evening Primrose Family)	Native	Locally abundant	Moist woods.	Enchanter's Nightshade
<i>Cirsium arvense</i> (L.) Scop.	<i>Cirsium arvense</i> (L.) Scop.	Asteraceae (Aster Family)	Introduced	Dominant	Throughout park.	Canada Thistle
<i>Corallorhiza maculata</i> Raf.	<i>Corallorhiza maculata</i> (Raf.) Raf.	Orchidaceae (Orchid Family)	Native	Rare	Moist woods.	Spotted Coralroot
<i>Cornus canadensis</i> L.	<i>Cornus canadensis</i> L.	Cornaceae (Dogwood Family)	Native	Common	Open woods.	Bunchberry
<i>Corydalis aurea</i> Willd.	<i>Corydalis aurea</i> Willd.	Fumariaceae (Fumitory Family)	Native	Occasional	Open woods.	Golden Corydalis
<i>Descurania sophia</i> (L.) Webb	<i>Descurania sophia</i> (L.) Webb ex Prantl.	Brassicaceae (Mustard Family)	Introduced	Occasional	Dry disturbed soil near roadside washouts on north perimeter of park.	Flixweed
<i>Disporum trachycarpum</i> (S. Wats.) B. & H.	<i>Prosartes trachycarpa</i> S. Watson	Liliaceae (Lily Family)	Native	Occasional	Moist woods.	Rough-fruited Fairybells
<i>Epilobium angustifolium</i> L.	<i>Chamerion angustifolium</i> subsp. <i>angustifolium</i> (L.) Holub	Onagraceae (Evening Primrose Family)	Native	Common	Moist, open woods and meadows.	Fireweed

<i>Epilobium ciliatum</i> subsp. <i>ciliatum</i> Raf.	<i>Epilobium ciliatum</i> subsp. <i>ciliatum</i> Raf.	Onagraceae (Evening Primrose Family)	Native	Common	Moist, disturbed areas, including stream margins and floating logs.	Northern Willowherb; Hairy Willowherb
<i>Epilobium palustre</i> L.	<i>Epilobium palustre</i> L.	Onagraceae (Evening Primrose Family)	Native	Common	Saturated ground in southwestern lake margin.	Marsh Willowherb
<i>Equisetum arvense</i> L.	<i>Equisetum arvense</i> L.	Equisetaceae (Horsetail Family)	Native	Common	Upland habitats.	Field Horsetail
<i>Equisetum palustre</i> L.	<i>Equisetum palustre</i> L.	Equisetaceae (Horsetail Family)	Native	Occasional	Saturated soil in open clearings.	Marsh Horsetail
<i>Equisetum pratense</i> Ehrh.	<i>Equisetum pratense</i> Ehrh.	Equisetaceae (Horsetail Family)	Native	Common	Meadows and damp woodlands.	Meadow Horsetail
<i>Equisetum pratense</i> Ehrh.	<i>Equisetum pratense</i> Ehrh.	Equisetaceae (Horsetail Family)	Native	Common	Forests.	Meadow Horsetail
<i>Equisetum sylvaticum</i> L.	<i>Equisetum sylvaticum</i> L.	Equisetaceae (Horsetail Family)	Native	Occasional	Moist forest.	Woodland Horsetail
<i>Erigeron canadensis</i> L.	<i>Conyza canadensis</i> (L.) Cronquist	Asteraceae (Aster Family)	Native	Occasional	Disturbed areas and roadsides.	Horseweed
<i>Erigeron glabellus</i> Nutt.	<i>Erigeron glabellus</i> Nutt.	Asteraceae (Aster Family)	Native	Uncommon	Moist woods.	Smooth Fleabane
<i>Erigeron philadelphicus</i> L.	<i>Erigeron philadelphicus</i> L.	Asteraceae (Aster Family)	Native	Occasional	Moist woods and stream banks.	Philadelphia Fleabane
<i>Erysimum cheiranthoides</i> L.	<i>Erysimum cheiranthoides</i> L.	Brassicaceae (Mustard Family)	Native	Occasional	Moist woods and lake shore.	Wormseed Mustard
<i>Fragaria vesca</i> L.	<i>Fragaria vesca</i> L.	Rosaceae (Rose Family)	Native	Common	Moist forest.	Woodland Strawberry
<i>Fragaria virginiana</i> Duchesne.	<i>Fragaria virginiana</i> Duchesne.	Rosaceae (Rose Family)	Native	Common	Forest and meadows.	Wild Strawberry
<i>Galeopsis speciosa</i> Mill.	<i>Galeopsis speciosa</i> Mill.	Lamiaceae (Mint Family)	Introduced	Rare	Open upland habitats, growing with <i>Galeopsis tetrahit</i> .	Yellow Hemp Nettle
<i>Galeopsis tetrahit</i> L.	<i>Galeopsis tetrahit</i> L.	Lamiaceae (Mint Family)	Introduced	Common	Open upland habitats.	Hemp Nettle

<i>Galium boreale</i> L.	<i>Galium boreale</i> L.	Rubiaceae (Madder Family)	Native	Common	Upland meadows and open forest.	Northern Bedstraw
<i>Galium trifidum</i> subsp. <i>trifidum</i> L.	<i>Galium trifidum</i> subsp. <i>trifidum</i> L.	Rubiaceae (Madder Family)	Native	Common	Shores of lakes and wet depressions	Small Bedstraw
<i>Galium triflorum</i> Michx.	<i>Galium triflorum</i> Michx.	Rubiaceae (Madder Family)	Native	Occasional	Moist woods.	Sweet-scented Bedstraw
<i>Geranium bicknellii</i> Briton	<i>Geranium bicknellii</i> Briton	Geraniaceae (Geranium Family)	Native	Occasional	Moist, disturbed ground.	Bicknell's Geranium
<i>Geum aleppicum</i> Jacq.	<i>Geum aleppicum</i> Jacq.	Rosaceae (Rose Family)	Native	Common	Moist woods.	Yellow Avens
<i>Geum macrophyllum</i> subsp. <i>perincisum</i> Willd.	<i>Geum macrophyllum</i> subsp. <i>perincisum</i> Willd.	Rosaceae (Rose Family)	Native	Common	Moist woods and meadows.	Large-leaf Avens
<i>Geum rivale</i> L.	<i>Geum rivale</i> L.	Rosaceae (Rose Family)	Native	Occasional	Margins of moist depressions.	Purple Avens; Water Avens
<i>Gnaphalium palustre</i> Nutt.	<i>Gnaphalium palustre</i> Nutt.	Asteraceae (Aster Family)	Native	Occasional	Moist areas near stream banks and floating logs.	Marsh Cudweed
<i>Habenaria hyperborea</i> (L.) R.Br	<i>Platanthera aquilonis</i> Sheviak	Orchidaceae (Orchid Family)	Native	Rare	Moist woods.	Northern Green Orchid
<i>Halenia deflexa</i> (Sm.) Griseb.	<i>Halenia deflexa</i> (Sm.) Griseb.	Gentianaceae (Gentain Family)	Native	Occasional	Open forests.	Spurred Gentian
<i>Heracleum lanatum</i> Michx.	<i>Heracleum spondylium</i> subsp. <i>montanum</i> (Schleich ex Gaudin) Briq.	Apiaceae (Carrot Family)	Native	Common	Moist woods.	Cow Parsnip
<i>Hieracium umbellatum</i> L.	<i>Hieracium umbellatum</i> L.	Asteraceae (Aster Family)	Native	Occasional	Open forest.	Narrow-leaved Hawkweed
<i>Hippuris vulgaris</i> L.	<i>Hippuris vulgaris</i> L.	Hippuridaceae (Mare's Tail Family)	Native	Occasional	Margin and shallow water of lake shore.	Mare's Tail
<i>Impatiens capensis</i> Meerb.	<i>Impatiens capensis</i> Meerb.	Balsaminaceae (Touch-me-not Family)	Native	Locally abundant	Moist woods and stream banks.	Jewelweed

<i>Impatiens noli-tangere</i> L.	<i>Impatiens noli-tangere</i> L.	Balsaminaceae (Touch-me-not Family)	Native	Locally abundant	Moist woods and stream banks.	Touch-me-not; Jewelweed
<i>Juncus balticus</i> Willd.	<i>Juncus balticus</i> Willd.	Juncaceae (Rush Family)	Native	Occasional	Moist meadows.	Wire Rush
<i>Juncus bufonius</i> L.	<i>Juncus bufonius</i> L.	Juncaceae (Rush Family)	Native	Common	Saturated, disturbed open areas near streams and lake margin.	Toad Rush
<i>Lappula squarrosa</i> (Retz.) Dumort	<i>Lappula squarrosa</i> (Retz.) Dumort	Boraginaceae (Borage Family)	Introduced	Occasional	Disturbed ground in upland areas.	Blue-bur
<i>Lathyrus ochroleucus</i> Hook.	<i>Lathyrus ochroleucus</i> Hook.	Fabaceae (Pea Family)	Native	Common	Forests.	Cream Peavine
<i>Lathyrus venosus</i> Muhl.	<i>Lathyrus venosus</i> Muhl. ex Willd.	Fabaceae (Pea Family)	Native	Common	Edges between forests and meadows.	Purple Peavine
<i>Ledum groenlandicum</i> Oeder	<i>Rhododendron groenlandicum</i> (Oeder) Kron and Judd	Ericaceae (Heath Family)	Native	Occasional	Moist spruce woods.	Labrador Tea
<i>Lepidium densiflorum</i> Schrad.	<i>Lepidium densiflorum</i> Schrad.	Brassicaceae (Mustard Family)	Native	Occasional	Disturbed ground of roadsides and well pads.	Peppergrass
<i>Linnaea borealis</i> L.	<i>Linnaea borealis</i> L.	Caprifoliaceae (Honeysuckle Family)	Native	Common	Forests.	Twinflower
<i>Lycopus asper</i> Greene	<i>Lycopus asper</i> Greene	Lamiaceae (Mint Family)	Native	Common	Moist, open areas of lake shore.	Rough Water-horehound
<i>Lycopus uniflorus</i> Michx.	<i>Lycopus uniflorus</i> Michx.	Lamiaceae (Mint Family)	Native	Occasional	Margin of lake in moist woods.	Northern Water-horehound
<i>Lysimachia ciliata</i> L.	<i>Lysimachia ciliata</i> L.	Primulaceae (Primrose Family)	Native	Common	Moist woods.	Fringed Loosestrife
<i>Lysimachia thrysiflora</i> L.	<i>Lysimachia thrysiflora</i> L.	Primulaceae (Primrose Family)	Native	Common	Moist woods and lake margin.	Tufted Loosestrife
<i>Maianthemum canadense</i> Desf.	<i>Maianthemum canadense</i> Desf.	Liliaceae (Lily Family)	Native	Common	Upland woods.	Wild Lily-of-the-valley
<i>Matricaria perforata</i> Merat	<i>Tripleurospermum inodorum</i> (L.) Sch. Bip.	Asteraceae (Aster Family)	Introduced	Occasional	Disturbed areas.	Scentless Chamomile; Scentless False Mayweed

<i>Medicago lupulina</i> L.	<i>Medicago lupulina</i> L.	Fabaceae (Pea Family)	Introduced	Occasional	Roadsides and well pads.	Black Medic
<i>Medicago sativa</i> L.	<i>Medicago sativa</i> L.	Fabaceae (Pea Family)	Introduced	Occasional	Roadsides and well pads.	Alfalfa
<i>Melilotus alba</i> Desr.	<i>Melilotus albus</i> Medik.	Fabaceae (Pea Family)	Introduced	Occasional	Disturbed upland habitat.	White Sweet Clover
<i>Melilotus officinalis</i> (L.) Lam	<i>Melilotus officinalis</i> (L.) Lam	Fabaceae (Pea Family)	Introduced	Occasional	Disturbed upland habitat.	Yellow Sweet Clover
<i>Mentha arvensis</i> L.	<i>Mentha arvensis</i> L.	Lamiaceae (Mint Family)	Native	Common	Lakeshore and moist open areas.	Wild Mint
<i>Mertensia paniculata</i> (Ait) G. Don.	<i>Mertensia paniculata</i> (Ait) G. Don.	Boraginaceae (Borage Family)	Native	Common	Forest.	Tall Bluebells
<i>Mitella nuda</i> L.	<i>Mitella nuda</i> L.	Saxifragaceae (Saxifrage Family)	Native	Common	Moist forest.	Bishop's-cap
<i>Moehringia lateriflora</i> (L.) Fenzl.	<i>Moehringia lateriflora</i> (L.) Fenzl.	Caryophyllaceae (Pink Family)	Native	Occasional	Moist woods and lakeshore.	Blunt Leaved Sandwort
<i>Monotropa uniflora</i> L.	<i>Monotropa uniflora</i> L.	Monotropaceae (Indian-pipe Family)	Native	Locally abundant	Open forest in southeast corner of park.	Indian Pipe
<i>Orthilia secunda</i> (L.) House	<i>Orthilia secunda</i> (L.) House	Pyrolaceae (Wintergreen Family)	Native	Occasional	Forest.	One-sided Wintergreen
<i>Orthilia secunda</i> (L.) House	<i>Orthilia secunda</i> (L.) House	Pyrolaceae (Wintergreen Family)	Native	Common	Forests.	One-sided Wintergreen
<i>Osmorhiza depauperata</i> Philippi	<i>Osmorhiza depauperata</i> Philippi	Apiaceae (Carrot Family)	Native	Common	Moist woods.	Blunt-fruited Sweet Cicely
<i>Osmorhiza longistylis</i> (Torr.) DC.	<i>Osmorhiza longistylis</i> (Torr.) DC.	Apiaceae (Carrot Family)	Native	Locally abundant	Moist woods in southeastern corner of park.	Smooth Sweet Cicely
<i>Petasites palmatus</i> (Ait.) A. Gray	<i>Petasites frigidus</i> var. <i>palmatus</i> (Ait.) Cronquist	Asteraceae (Aster Family)	Native	Common	Forests.	Palmate-leaved Coltsfoot

<i>Petasites sagittatus</i> (Pursh) A. Gray	<i>Petasites frigidus</i> var. <i>sagittatus</i> (Banks ex Pursh) Chern	Asteraceae (Aster Family)	Native	Common	Moist meadows and willow thickets.	Arrow-leaved Coltsfoot
<i>Physostegia</i> <i>parviflora</i> Nutt.	<i>Physostegia</i> <i>parviflora</i> Nutt. ex A. Gray	Lamiaceae (Mint Family)	Native	Occasional	Willow thickets and lake margin.	False Dragonhead
<i>Plantago major</i> L.	<i>Plantago major</i> L.	Plantaginaceae (Plantain Family)	Introduced	Occasional	Moist, disturbed areas.	Common Plantain
<i>Polygonum</i> <i>amphibium</i> L.	<i>Persicaria</i> <i>amphibia</i> (L.) Delarbre	Polygonaceae (Buckwheat Family)	Native	Common	Shallow water of lake and ditches.	Water Smartweed
<i>Polygonum</i> <i>lapathifolium</i> L.	<i>Persicaria</i> <i>lapathifolium</i> (L.) Gray	Polygonaceae (Buckwheat Family)	Native	Common	Moist, open areas.	Pale Smartweed
<i>Potentilla anserina</i> L.	<i>Potentilla anserina</i> L.	Rosaceae (Rose Family)	Native	Common	Moist margin of lake and ditches.	Silverweed
<i>Potentilla</i> <i>norvegica</i> L.	<i>Potentilla</i> <i>norvegica</i> L.	Rosaceae (Rose Family)	Native	Common	Open areas and disturbed ground.	Rough Cinquefoil
<i>Potentilla rivalis</i> Nutt.	<i>Potentilla rivalis</i> Nutt.	Rosaceae (Rose Family)	Native	Occasional	Shallow water at lake shore.	River Cinquefoil
<i>Pyrola asarifolia</i> Michx.	<i>Pyrola asarifolia</i> Michx.	Pyrolaceae (Wintergreen Family)	Native	Common	Forest.	Common Pink Wintergreen
<i>Pyrola elliptica</i> Nutt.	<i>Pyrola elliptica</i> Nutt.	Ericaceae (Heather Family)	Native	Occasional		White Wintergreen
<i>Ranunculus acris</i> L.	<i>Ranunculus acris</i> L.	Ranunculaceae (Buttercup Family)	Introduced	Occasional	Moist meadows.	Tall Buttercup
<i>Ranunculus</i> <i>aquatilis</i> L.	<i>Ranunculus</i> <i>aquatilis</i> L.	Ranunculaceae (Buttercup Family)	Native	Occasional	Shallow water and mud.	White Water Crowfoot
<i>Ranunculus</i> <i>macounii</i> Britt.	<i>Ranunculus</i> <i>macounii</i> Britt.	Ranunculaceae (Buttercup Family)	Native	Occasional	Moist woods and margins of lake and streams.	Macoun's Buttercup
<i>Ranunculus</i> <i>sceleratus</i> L.	<i>Ranunculus</i> <i>sceleratus</i> L.	Ranunculaceae (Buttercup Family)	Native	Common	Lake shore.	Celery-leaved Buttercup

<i>Rorippa palustris</i> (L.)	<i>Rorippa palustris</i> (L.)	Brassicaceae (Mustard Family)	Native	Common	Moist woods and margins of lake and streams.	Yellow Cress
<i>Rubus pubescens</i> Raf.	<i>Rubus pubescens</i> Raf.	Rosaceae (Rose Family)	Native	Common	Moist woods throughout park.	Dewberry; Running Raspberry
<i>Rumex crispus</i> L.	<i>Rumex crispus</i> L.	Polygonaceae (Buckwheat Family)	Introduced	Occasional	Moist lake shore and ditches.	Curled Dock
<i>Rumex maritimus</i> L.	<i>Rumex maritimus</i> L.	Polygonaceae (Buckwheat Family)	Native	Occasional	Open areas of disturbed lake shore, including floating logs.	Golden Dock
<i>Rumex occidentalis</i> S. Wats.	<i>Rumex occidentalis</i> S. Wats.	Polygonaceae (Buckwheat Family)	Native	Common	Moist lake shore and ditches.	Western Dock
<i>Rumex triangulivalvis</i> (Dans.) Rech. f.	<i>Rumex triangulivalvis</i> (Dans.) Rech. f.	Polygonaceae (Buckwheat Family)	Native	Occasional	Moist, open areas.	Narrow-leaved Dock
<i>Sanicula marilandica</i> L.	<i>Sanicula marilandica</i> L.	Apiaceae (Carrot Family)	Native	Locally abundant	Moist forest.	Black Sanicle
<i>Scutellaria galericulata</i> L.	<i>Scutellaria galericulata</i> L.	Lamiaceae (Mint Family)	Native	Common	Moist lake margin, including floating logs.	Marsh Skullcap
<i>Senecio congestus</i> (R. Br.) DC.	<i>Tephrosieris palustris</i> (L.) Reichenbach	Asteraceae (Aster Family)	Native	Occasional	Moist open areas of lakeshore in southwest corner of park.	Marsh Ragwort
<i>Senecio eremophilus</i> Richards	<i>Senecio eremophilus</i> Richards	Asteraceae (Aster Family)	Native	Occasional	Moist, open woods.	Ragwort
<i>Senecio vulgaris</i> L.	<i>Senecio vulgaris</i> L.	Asteraceae (Aster Family)	Introduced	Occasional	Disturbed, open ground.	Common Groundsel
<i>Silene crassifolia</i> Ehrh.	<i>Silene crassifolia</i> Ehrh.	Caryophyllaceae (Pink Family)	Native	Occasional	Moist ground at margin of ponds and moist depressions.	Thickleaved Chickweed
<i>Sisymbrium altissimum</i> L.	<i>Sisymbrium altissimum</i> L.	Brassicaceae (Mustard Family)	Introduced	Occasional	Roadsides and well pads.	Tall Hedge-mustard
<i>Sium suave</i> Walt.	<i>Sium suave</i> Walt.	Apiaceae (Carrot Family)	Native	Common	Wet meadows and sedge flats.	Water Parsnip
<i>Smilacina stellata</i> (L.) Desf.	<i>Maianthemum stellatum</i> (L.) Desf.	Liliaceae (Lily Family)	Native	Common	Upland woods and open meadows.	Star-flowered Solomon's Seal

<i>Smilacina stellata</i> (L.) Desf.	<i>Maianthemum stellatum</i> (L.) Link	Liliaceae (Lily Family)	Native	Common	Woods and meadows.	Star-flowered Solomon's Seal
<i>Solidago canadensis</i> L.	<i>Solidago canadensis</i> L.	Asteraceae (Aster Family)	Native	Common	Open forests and meadows.	Canada Goldenrod
<i>Sonchus asper</i> (L.) Hill	<i>Sonchus asper</i> (L.) Hill	Asteraceae (Aster Family)	Introduced	Uncommon	Moist, disturbed ground.	Spiny Sowthistle
<i>Sonchus uliginosus</i> Bieb.	<i>Sonchus arvensis</i> subsp. <i>uliginosus</i> (Bieb.) Nyman	Asteraceae (Aster Family)	Native	Common	Moist, open forest.	Perennial Sow Thistle
<i>Stachys palustris</i> L.	<i>Stachys palustris</i> L.	Lamiaceae (Mint Family)	Native	Common	Moist meadows and open woods.	Marsh Hedge Nettle
<i>Stellaria longifolia</i> Muhl.	<i>Stellaria longifolia</i> Muhl. ex Willd.	Caryophyllaceae (Pink Family)	Native	Common	Moist woods and lakeshore.	Long-leaved Chickweed
<i>Stellaria media</i> (L.) Vill.	<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae (Pink Family)	Introduced	Occasional	Margins of trails and open forest.	Chickweed
<i>Streptopus amplexifolius</i> (L.) DC.	<i>Streptopus amplexifolius</i> (L.) DC.	Liliaceae (Lily Family)	Native	Occasional	Moist woods.	Twisted Stalk
<i>Tanacetum vulgare</i> L.	<i>Tanacetum vulgare</i> L.	Asteraceae (Aster Family)	Introduced	Occasional	Margins of trails and open forest.	Tansy
<i>Taraxacum officinale</i> Weber	<i>Taraxacum officinale</i> Weber	Asteraceae (Aster Family)	Introduced	Occasional	Throughout upland habitat.	Common Dandelion
<i>Thalictrum dasycarpum</i> Fisch & Ave-Lall.	<i>Thalictrum dasycarpum</i> Fisch & Ave-Lall.	Ranunculaceae (Buttercup Family)	Native	Occasional	Moist open forest in southeast corner of park.	Tall Meadow Rue
<i>Thalictrum venulosum</i> Trel.	<i>Thalictrum venulosum</i> Trel.	Ranunculaceae (Buttercup Family)	Native	Common	Upland habitats, including meadows and open forests.	Veiny Meadow Rue
<i>Thlaspi arvense</i> L.	<i>Thlaspi arvense</i> L.	Brassicaceae (Mustard Family)	Introduced	Occasional	Disturbed upland habitats.	Stinkweed; Pennycress
<i>Trifolium hybridum</i> L.	<i>Trifolium hybridum</i> L.	Fabaceae (Pea Family)	Introduced	Common	Margins of forest and disturbed open areas.	Alsike Clover
<i>Trifolium pratense</i> L.	<i>Trifolium pratense</i> L.	Fabaceae (Pea Family)	Introduced	Common	Moist, open areas.	Red Clover
<i>Trifolium repens</i> L.	<i>Trifolium repens</i> L.	Fabaceae (Pea Family)	Introduced	Common	Margins of forest and disturbed open areas.	White Clover

<i>Triglochin maritima</i> L.	<i>Triglochin maritima</i> L.	Juncaginaceae (Arrow-grass Family)	Native	Occasional	Moist, open areas in western regions of park.	Seaside Arrow Grass
<i>Urtica dioica</i> subsp. <i>gracilis</i> (Aiton) Selander	<i>Urtica dioica</i> subsp. <i>gracilis</i> (Aiton) Selander	Urticaceae (Nettle Family)	Native	Dominant	Lake margin and berms, moist open forest.	Stinging Nettle; Common Nettle
<i>Veronica americana</i> (Raf.) Schw.	<i>Veronica americana</i> (Raf.) Schw.	Plantaginaceae (Plantain Family)	Native	Occasional	Margins of lake and streams, including floating woody debris.	American Brooklime
<i>Vicia americana</i> Muhl.	<i>Vicia americana</i> Muhl. ex Willd	Fabaceae (Pea Family)	Native	Common	Upland habitats.	American Vetch
<i>Vicia cracca</i> L.	<i>Vicia cracca</i> L.	Fabaceae (Pea Family)	Introduced	Dominant	Open margins of lakeshore.	Tufted Vetch
<i>Viola adunca</i> J.E. Smith	<i>Viola adunca</i> J.E. Smith	Violaceae (Violet Family)	Native	Occasional	Open forests.	Early Blue Violet
<i>Viola canadensis</i> L.	<i>Viola canadensis</i> L.	Violaceae (Violet Family)	Native	Common	Moist woods.	Canada Violet

APPENDIX 4. GPS coordinates for the southwest corner of 50m by 50m plots and each end of transects on the shore of Big Lake. TS = shallow end of transect; TD = deep end of transect; P = southwest corner of 50m by 50m plots. GPS position format: WGS 72.

Plot/ Transect Number	GPS Coordinates
TS1	N 53°34'53.7 W 113°45'43.7
TD1	N 53°34'56.0 W 113°45'40.3
TS2	N 53°35'29.6 W 113°42'50.4
TD2	N 53°36'31.1 W 113°42'40.5
TS3	N 53°36'31.1 W 113°45'58.2
TD3	N 53°36'27.8 W 113°45'58.6
TS4	N 53°35'32.7 W 113°46'00.5
TD4	N 53°35'35.9 W 113°45'58.5
TS5	N 53°35'36.6 W 113°46'00.5
TD5	N 53°35'39.1 W 113°46'11.0
TS6	N 53°36'15.0 W 113°44'39.4
TD6	N 53°36'13.2 W 113°44'44.1
TS7	N 53°36'37.2 W 113°39'32.5
TD7	N 53°36'38.6 W 113°39'37.4
TS8	N 53°36'07.9 W 113°40'02.2
TD8	N 53°36'09.8 W 113°40'06.7
TS9	N 53°36'20.0 W 113°40'49.2
TD9	N 53°36'17.7 W 113°40'45.4
TS10	N 53°35'29.3 W 113°42'03.7
TD10	N 53°35'32.5 W 113°42'03.3
TS11	N 53°35'42.4 W 113°42'14.1
TD11	N 53°35'39.3 W 113°42'16.2
TS12	N 53°35'48.8 W 113°43'19.3

Plot/ Transect Number	GPS Coordinates
TD12	N 53°35'45.9 W 113°43'16.8
TS13	N 53°37'15.6 W 113°40'09.5
TD13	N 53°37'14.9 W 113°40'14.8
TS14	N 53°36'13.9 W 113°41'25.8
TD14	N 53°36'11.4 W 113°41'22.7
TS15	N 53°36'48.2 W 113°39'28.7
TD15	N 53°36'49.1 W 113°39'34.0
TS16	N 53°36'53.7 W 113°41'03.3
TD16	N 53°36'53.4 W 113°41'02.8
TS17	N 53°35'04.5 W 113°44'01.1
TD17	N 53°35'06.5 W 113°44'02.5
P1	N 53°36'09.5 W 113°39'54.3
P2	N 53°35'29.5 W 113°47'12.3
P3	N 53°36'26.0 W 113°39'29.0
P4	N 53°35'04.4 W 113°46'14.2
P5	N 53°35'11.0 W 113°46'14.8
P6	N 53°35'15.9 W 113°46'25.5
P7	N 53°36'02.8 W 113°46'48.0