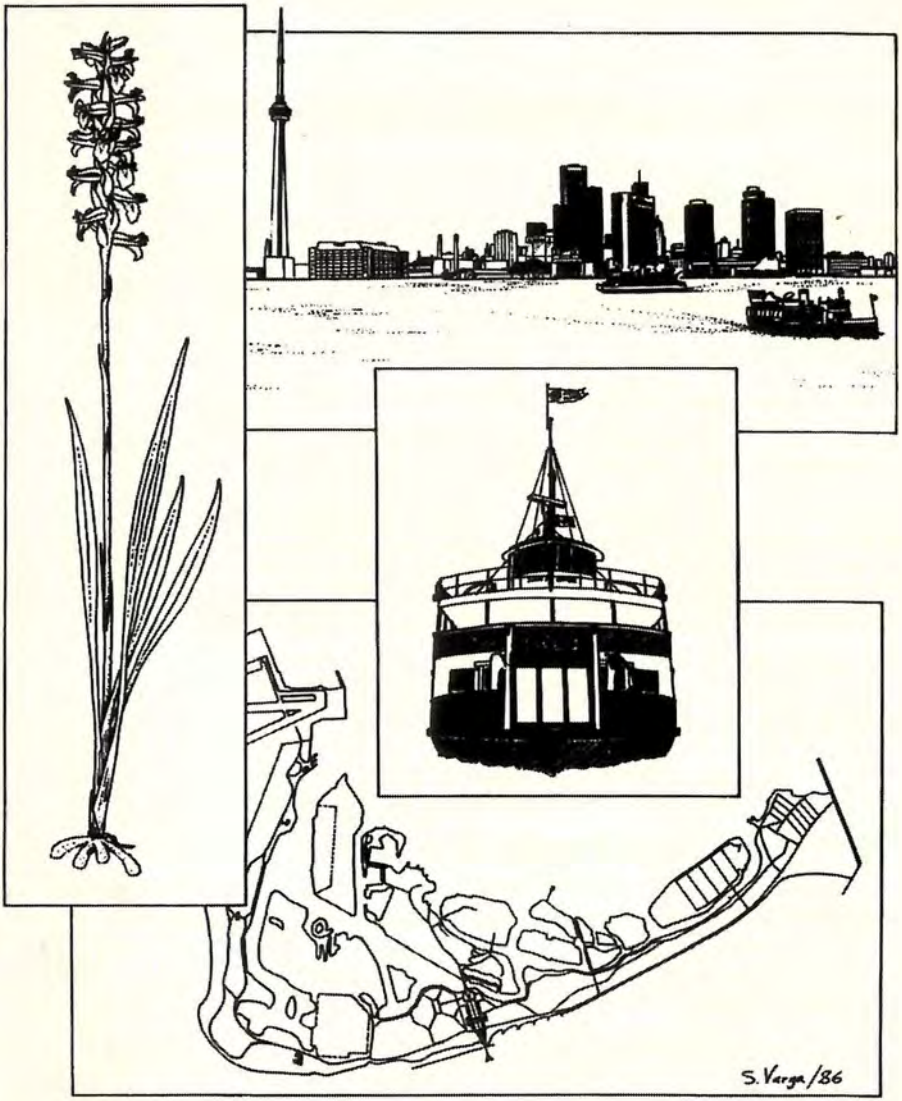
Toronto Islands

Plant Communities and Noteworthy Species

by Steve Varga



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COVER: top left, clockwise

Nodding Ladies'-tresses (Spiranthes cernua)
Toronto skyline
Toronto Islands ferry
map of Toronto Islands

drawing by Steve Varga

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CONTENTS

ACKNOWLEDGEMENTS

I would like to thank Paul Catling and Sheila McKay-Kuja for encouraging my interest in the flora of the Toronto Islands. The material in this booklet is based on fieldwork carried out under an Experience '78 grant for the Ontario Ministry of Natural Resources, Maple District. The booklet has been adapted from a series of articles published in the TORONTO FIELD NATURALIST, the newsletter of the Toronto Field Naturalists. Valuable editorial advice on the manuscript was received from Deborah Metsger, Helen Juhola, Dr. Tim Dickinson and Mary-Louise Stewart. Helen Juhola typed the manuscript and supervised the editing and publication. Cover typesetting was done by Elaine Farragher. The Department of Botany, Royal Ontario Museum, kindly provided access to its dried specimens in the Vascular Plant Herbarium (TRT).

Steve Varga

INTRODUCTION

Only a ten-minute ferry ride from the heart of downtown Toronto we find our region's most significant botanical site. The Toronto Islands contain the last sizeable remnant of natural shoreline communities along the western half of Lake Ontario. Here wet meadows full of showy wildflowers can be found only a few steps from the harsh environment of dunes and beaches. On the older more stable sands where Cottonwoods flourish are openings reminiscent of the Tall-grass Prairies of the Midwest.

This guide will focus on some of the common as well as unusual plant species to be encountered in the Islands' wildlife areas. Most of them are illustrated, the number after the plant name corresponding to the illustration number. For a more complete wildflower guide, refer to the guides listed on page 19.

Ferry service to the Toronto Islands is operated by the Metropolitan Toronto Parks and Property Department from the foot of Bay Street. Ferries will take you to Ward's Island, Centre Island or Hanlan's Point (Figure 2). It is recommended that in the summer you avoid the Centre Island ferry on statutory holidays and Sundays. Service is frequent during the summer months but in the fall you should call ahead to find out the sailing times (392-8193).

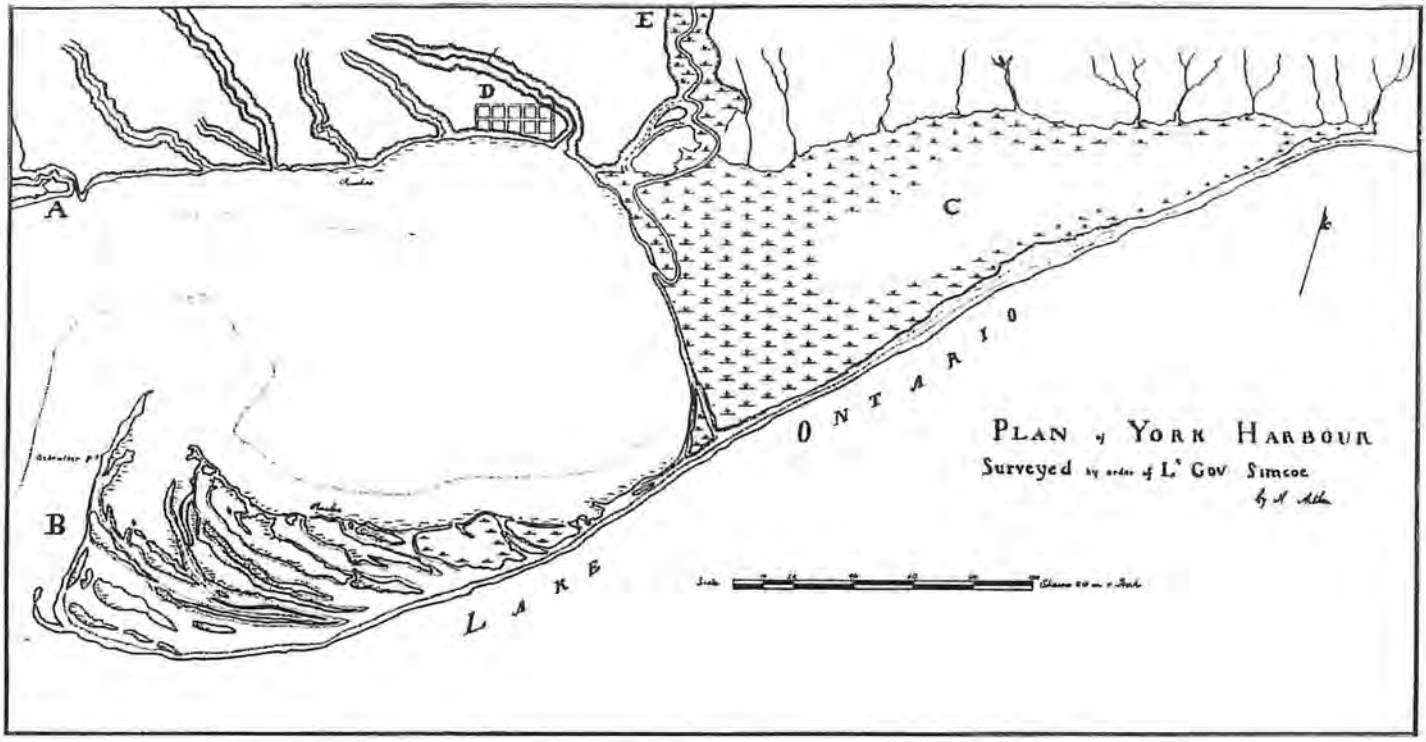


Figure 1. THE PENINSULA OF ELIZABETH SIMCOE'S TIME. This map is based on Alexander Aitken's "Plan of York [Toronto] Harbour", made for Lt.Governor Simcoe in the summer of 1793. The following locations are noted on the map: A. York Barracks [Fort York] B. the Peninsula C. Ashbridges' Marsh D. Town of York E. Don River

HISTORY OF THE TORONTO ISLANDS

The diary of Mrs. Elizabeth Simcoe, wife of the first Lieutenant-Governor of Upper Canada, provides the earliest written account of the Toronto Islands which, at that time, was a peninsula. In 1793, she reported:

> "We rode on the peninsula so I called the spit of sand for it is united to the mainland by a very narrow neck of ground...to the end of the peninsula ...We met with some good natural meadows and several ponds. The trees are mostly the Poplar kind [Eastern Cottonwood] covered with wild Vines and there are some fir [White Pine]. On the ground were everlasting Peas [Beach Pea] creeping in abundance of a purple colour."

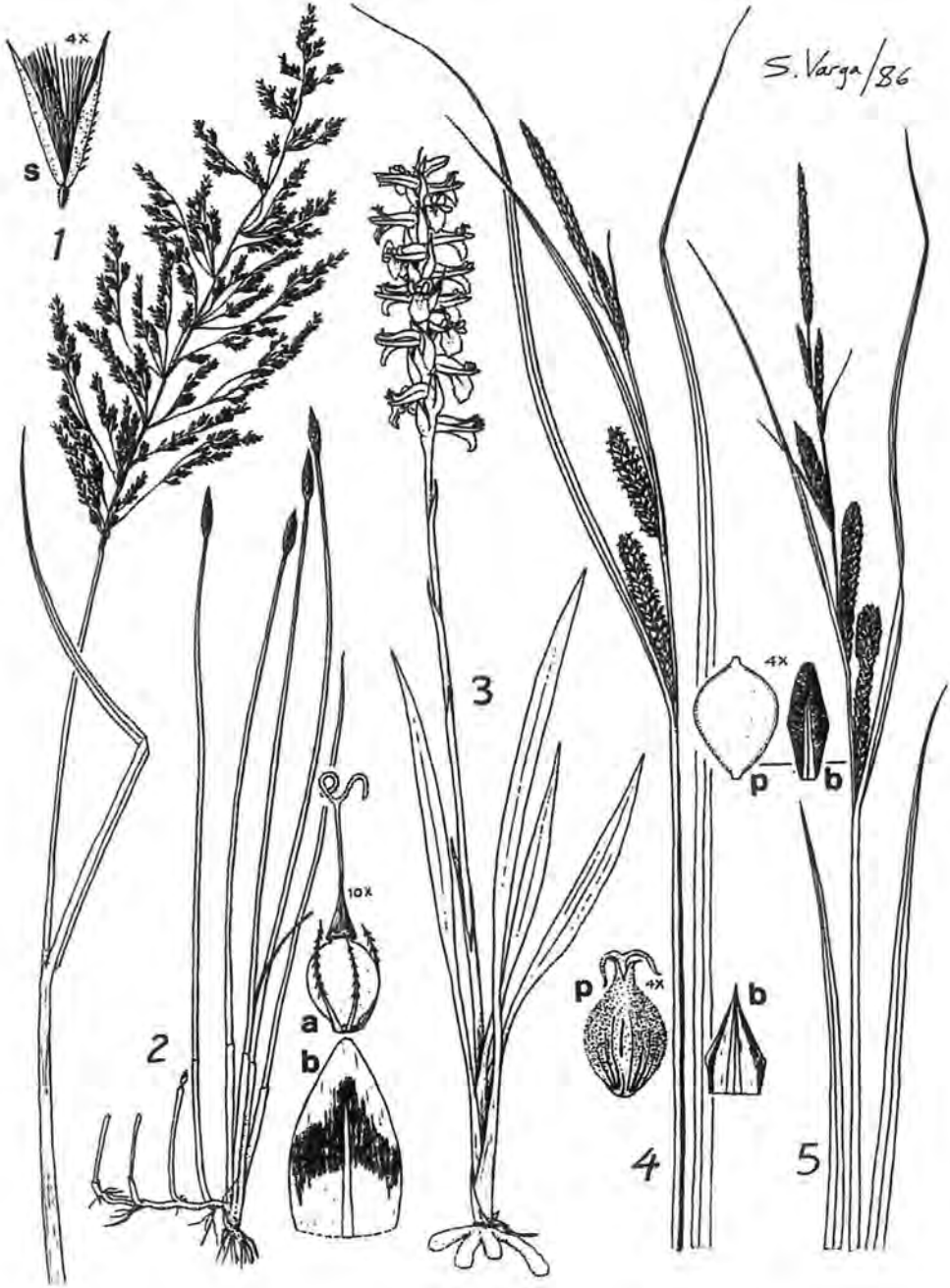
During Mrs. Simcoe's day, the Islands consisted of a series of parallel sand spits (Figure 1) stretching east to what is now the Greenwood racetrack. New spits were continually being formed to the south and west by sediment-laden, long shore currents which carried material eroded from the Scarborough Bluffs.

In 1858 a terrific storm broke through the middle of the main sand spit transforming the western half of the peninsula into the "Toronto Islands".

It was not until 1875 that development began in earnest on the Islands. By the early 1900's dredging and landfill had destroyed many of the marshlands and meadows, while residential areas had taken over most of the woodlands. In the process, Mrs. Simcoe's beloved Beach Pea (Lathyrus japonicus) and 25 other regionally rare plant species were extirpated from the Islands.

Today, most of the Islands are managed as formal parkland with homes confined to Ward's and Algonquin Islands. As well, the Islands support an airport, amusement park, children's farm, water filtration plant and even radio transmitter towers. Of the more than 325 hectares of the Toronto Islands, fewer than 40 remain in a natural state, reminding us of what the peninsula looked like in Mrs. Simcoe's day.

Wet meadows



PLANT COMMUNITIES

The natural areas of the Toronto Islands contain six plant communities: wet meadows, lagoon edges, beach strands, dunes, Cottonwood woodlands and sand prairies (Figure 2). Each of these is considered rare in our region. Moreover, the Islands support one of the region's highest concentrations of rare plant species: 40 regional rarities, 15 species unknown elsewhere in our region and three provincial rarities (see page 20). A total of 338 plant species is known from these natural areas.

WET MEADOWS

Most of the Islands' significant plant species occur in its wet meadows. The best examples are located at Gibraltar Point (wet meadow 2) and north of the filtration plant (wet meadows 4 and 5).

The meadows are flooded in the spring but gradually dry out as lake levels drop during the summer months. Graminoid species such as CANADA BLUE JOINT (Calamagrostis canadensis - 1), a grass, and SEDGES (Carex lanuginosa - 4, and Carex aquatilis - 5) dominate the shallower periphery of the meadows. In June, the shape of the perigynium, a sac-like structure which completely encloses the female flower, is used to identify the sedges. In Carex aquatilis the perigynia are flattened and hairless; in Carex lanuginosa they are triangular in cross-section with a hairy surface. In these Carex species, the female and male flowers are on separate clusters with male clusters located at the top of the plant.

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1 Calamagrostis canadensis and close-up of spikelet (flower) - s
2 Eleocharis erythropoda, close-up of achene (seed) - a and surrounding bract - b
3 Spiranthes cernua
4 Carex lanuginosa, close-up of perygynium - p and surrounding bract - b
5 Carex aquatilis, close-up of perygynium - p and surrounding bract - b

Towards the wetter, central portions of the meadows, SPIKERUSH (Eleocharis erythropoda - 2) is prevalent. In addition, BALTIC RUSH (Juncus balticus - 10) and NELSON'S HORSETAIL (Equisetum X nelsonii - 13) are common associates throughout. The former species is recognized by its row of tall spikes connected by an underground root or rhizome. Nelson's Horsetail is distinguished from other members of its genus by its lack of side branches and the whorl of five to ten small teeth at intervals along the stem.

By September, the green meadows become a kaleidoscope of colour. The prominent hues differ from one meadow to the next. Pinks are most prevalent in meadow 5 where one can find large pink spikes of the FALSE DRAGONHEAD (Physostegia virginiana - 6) and less frequently, the delicate lavender flowers of KALM'S LOBELIA (Lobelia kalmii - 11) and the satin blue funnels of FRINGED GENTIAN (Gentiana crinita - 7). In contrast, meadows 1 and 2 have a carpet of NODDING LADIES'-TRESSES (Spiranthes cernua - 3), a white-flowered orchid, while meadow 7 on Ward's Island is dominated by PURPLE GERARDIA (Agalinus purpurea - 8).

Not all of these showy wildflowers are conspicuous. Occasionally one will encounter the small white flowers of MARSH BELLFLOWER (Campanula aparinoides - 12) hidden among the sedges and grasses. Its weak stems have bristles which allow the plant to cling to other vegetation for support.

Whether or not one sees all the plants illustrated will depend on the lake levels during a particular year. Record low or high lake levels will dramatically affect the abundance and even the presence of wet meadow species. For instance, in the summer of 1978 the level of Lake Ontario was below average; the once flooded central portions of wet meadows 3 and 4 became thickly covered by FALSE PIMPERNEL (Lindernia dubia - 9). This mint-like annual was absent when the lake

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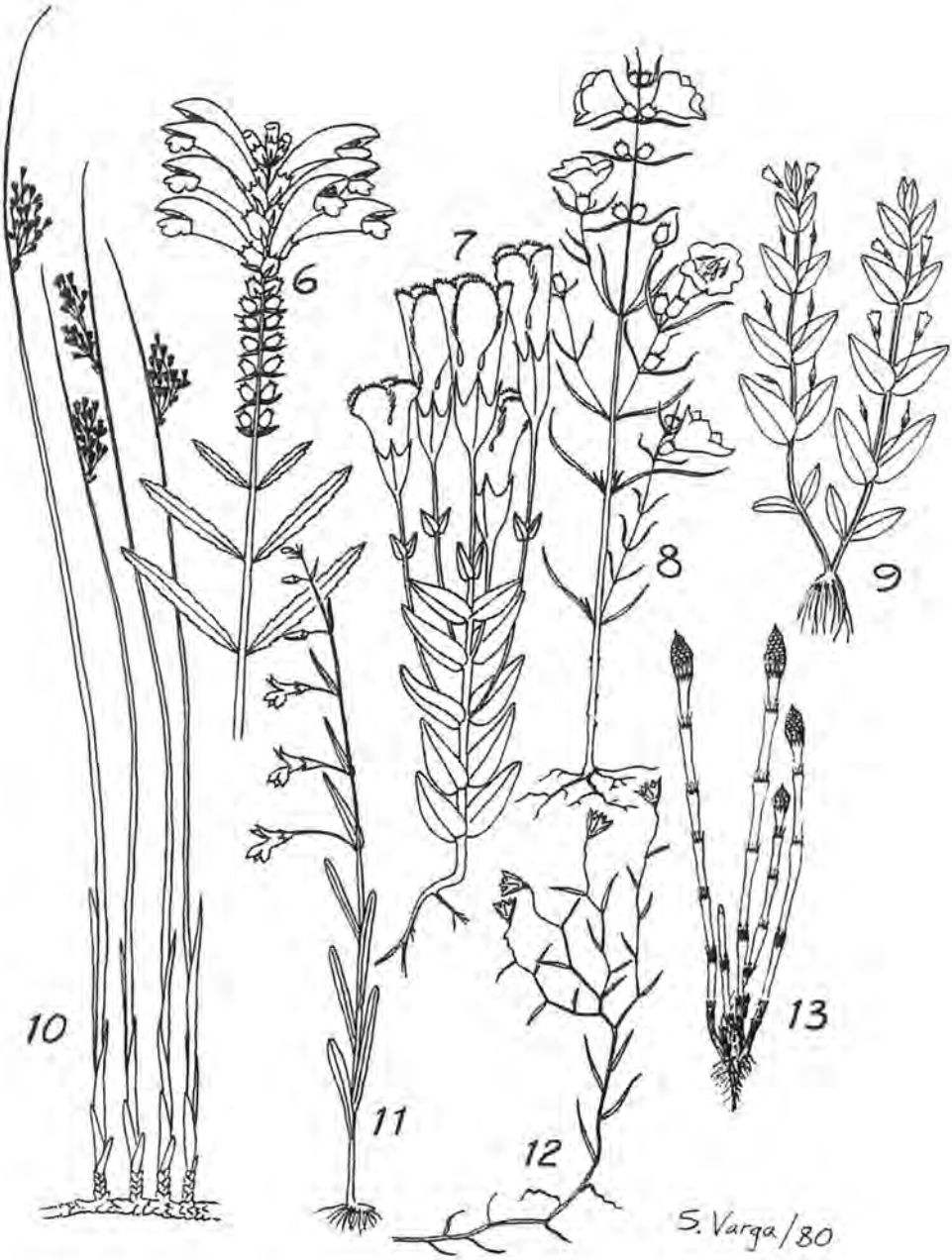
6	Physostegia virginiana	7	Gentiana crinita
8	Agalinus purpurea	9	Lindernia dubia
10	Juncus balticus	11	Lobelia kalmii
12	Campanula aparinoides	13	Equisetum X nelsonii

Wet meadows



level was high between 1972 and 1974. Apparently the seeds of False Pimpernel have the ability to lie dormant in the ground, even for a number of years, until the lake reaches an appropriate level. Then huge numbers of seeds will germinate, renewing the cycle.

LAGOON EDGES

Moist sands along the edges of lagoons support a number of species which are also common in the wet meadows. However, lagoon edges have unique features such as the occasional clump of Common Cattail (Typha latifolia). The finest examples are located along the shoreline margins north of the filtration plant.

BEACH STRANDS

The bathing beaches on the Toronto Islands are great places to stretch out and get a tan, but they are also noteworthy for their unusual plant species, one of which is provincially rare. Ecologically referred to as "beach strands", the best beaches to visit are those on the southeastern part of Ward's Island and west of the Island Airport. One can also find good examples on the Leslie Street Spit. Late August to early October is the best time to explore this community.

Growing on notoriously unstable environments, beach strand plants have to contend with shifting sands and fluctuating lake levels. Under such conditions, annual plants fare best. The species present depend on the amount of moisture in the sands.

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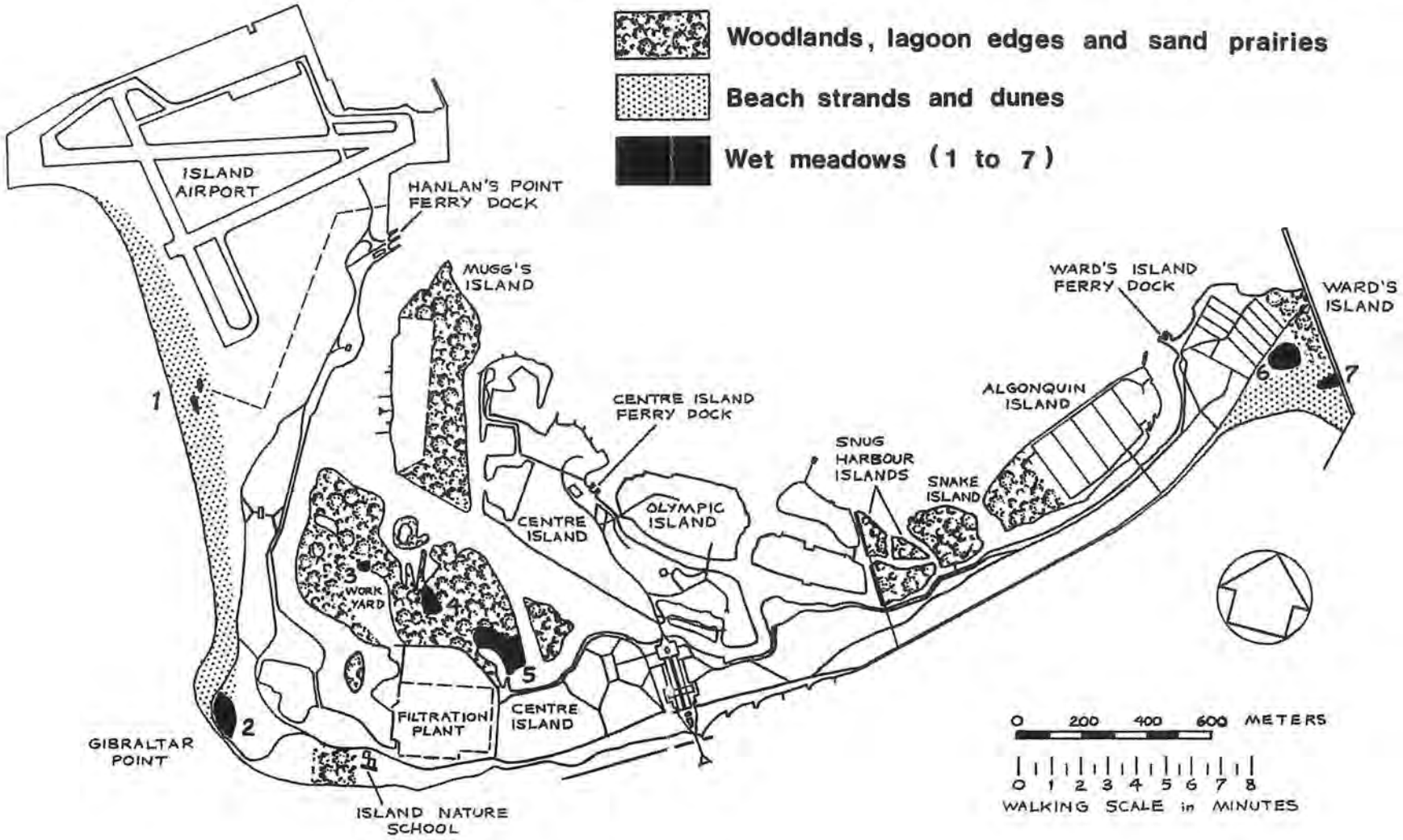
14 Cyperus rivularis and close-up of bracts - b
15 Cyperus engelmannii bracts - b
16 Cyperus odoratus var. squarrosus and close-up of bracts - b
17 Cakile edentula var. lacustris and close-up of fruit - f
18 Cycloloma atriplicifolium
19 Juncus bufonius
20 Potentilla paradoxa
21 Euphorbia polygonifolia

Beach strands

Figure 2: NATURAL AREAS ON THE TORONTO ISLANDS



The moister parts of the beach strands, such as along the edges of sheltered pools, are dominated by three sedge species: RIVER CYPERUS (Cyperus rivularis - 14), ENGELMANN'S UMBRELLA-SEDGE (Cyperus engelmannii - 15), and FRAGRANT CYPERUS (Cyperus odoratus var. squarrosus - 16). These are small plants with linear leaves arranged in three vertical ranks on a triangular stem. The species are distinguished by the small scale-like bracts which enclose the minute flowers; the bracts are grouped into elongated clusters. River Cyperus is characterized by its reddish bracts, while the other two are identified by the arrangement of the bracts. In Engelmann's Umbrella-sedge, the bracts do not overlap on the same side of the cluster; on Fragrant Cyperus, they do. Among the Cyperus species you will also find small clumps of TOAD RUSH (Juncus bufonius - 19).

The drier parts of the beach strands feature large patches of BUSHY CINQUEFOIL (Potentilla paradoxa - 20) -- a species rare in Ontario. It is easily identified, as the common name suggests, by its bushy appearance and its highly dissected leaves and five-petalled yellow flowers. A common associate is the WINGED PIGWEED (Cycloloma atriplicifolium - 18); it resembles a tumbleweed and during the fall the dead plant actually breaks off at the ground and tumbles in the wind.

Two additional species in this community, SEA ROCKET (Cakile edentula var. lacustris - 17) and SEASIDE SPURGE (Euphorbia polygonifolia - 21), have an interesting distribution in North America. As suggested by the "sea" adjective, these plants are essentially confined to the Atlantic Coast with an isolated population along the shores of the Great Lakes. It has been postulated that their ranges expanded into the Great Lakes, just after the glaciers retreated, when today's St. Lawrence River Valley was a brackish sea connected to the Atlantic. Seaside Spurge forms a flattened mat on the sand, while Sea Rocket is an erect mustard with four-petalled white flowers.

Sea Rocket is the classic example of a plant adapted to life on the shifting sands of beach strands. It has a distinctive

two-parted fruit of which the basal portion stays on after the plant dies. If the plant is buried by the sands, a dense clump of Sea Rockets will be produced the next spring. Meanwhile the terminal part of the fruit breaks off the plant; this can be transported a great distance by winds and waves. The following spring a linear band of Sea Rockets will appear along drift lines on the beach where these seeds have germinated.

DUNES

The Toronto Islands has a large dune system stretching from Gibraltar Point to the Island Airport and a smaller one just behind the Ward's Island beach. These are the only sand dunes within 150 kilometers of Toronto. The best time to visit this community is from late August to early October.

The open dunes are a harsh environment for plants. Survival depends on adaptation to droughts, direct sunlight, strong winds and shifting sands. Once established these "pioneer" plants will grip loose sand, binding and stabilizing it. This enables less hardy species to colonize the dunes, eventually resulting in a succession towards a forest of Eastern Cottonwood (Populus deltoides).

One of the first pioneers of the open dunes is MARRAM GRASS (Ammophila breviligulata - 27) which, in fact, does best on shifting sands. Only on these sites will it produce seeds. Elsewhere it spreads vegetatively by underground rhizomes. Marram grass is characterized by long leaf blades with prominent ridges along the inner surface; the leaves actually roll up during dry periods to conserve moisture. This species has adapted to the shifting sands by continually growing upwards and developing new lateral roots as sand piles up around it. Over the years this can produce a tap root which may descend as much as five meters into the sand.

Two other important dune species which bind the sand are WOOLLY-HEADED WILLOW (Salix eriocephala - 23) and SANDBAR WILLOW (Salix exigua - 24). The former is distinguished by

its wider leaves and the presence of stipules, small leaf-like structures at the base of each leaf blade.

Common associates with these important colonizers are two grass species: CANADA WILDRYE (Elymus canadensis - 28) which has very long spines in the flowering head and DROPSEED (Sporobolus cryptandrus - 25) which is easily identified by the fringe of hairs at the base of its leaf blades. The only herbaceous species common to the dunes is WORMWOOD (Artemisia campestris ssp. caudata - 22). It is distinguished by its silvery gray colour and its deeply dissected leaves. The odd colour of Wormwood is produced by a dense mat of silvery hairs which, by reflecting intense sunlight, act as insulators.

Finally, the dunes contain a regionally rare SEDGE called Cyperus schweinitzii - 26. It has a triangular stem, is about 25 cm tall and has linear leaves arranged in three vertical ranks.

COTTONWOOD WOODLANDS

Many naturalists know that the woodlands on the Toronto Islands support one of North America's largest concentrations of Saw-whet Owls during the fall migration, yet few realize that this woodland community is found nowhere else in our region. The finest examples occur north of the filtration plant and west of the Island Nature School.

Characteristic of these woodlands is a tree layer of EASTERN COTTONWOOD (Populus deltoides - 29) with a dense shrub layer of willows and Red-osier Dogwood (Cornus stolonifera), the latter easily recognized by its red branches, white fruits and opposite leaves.

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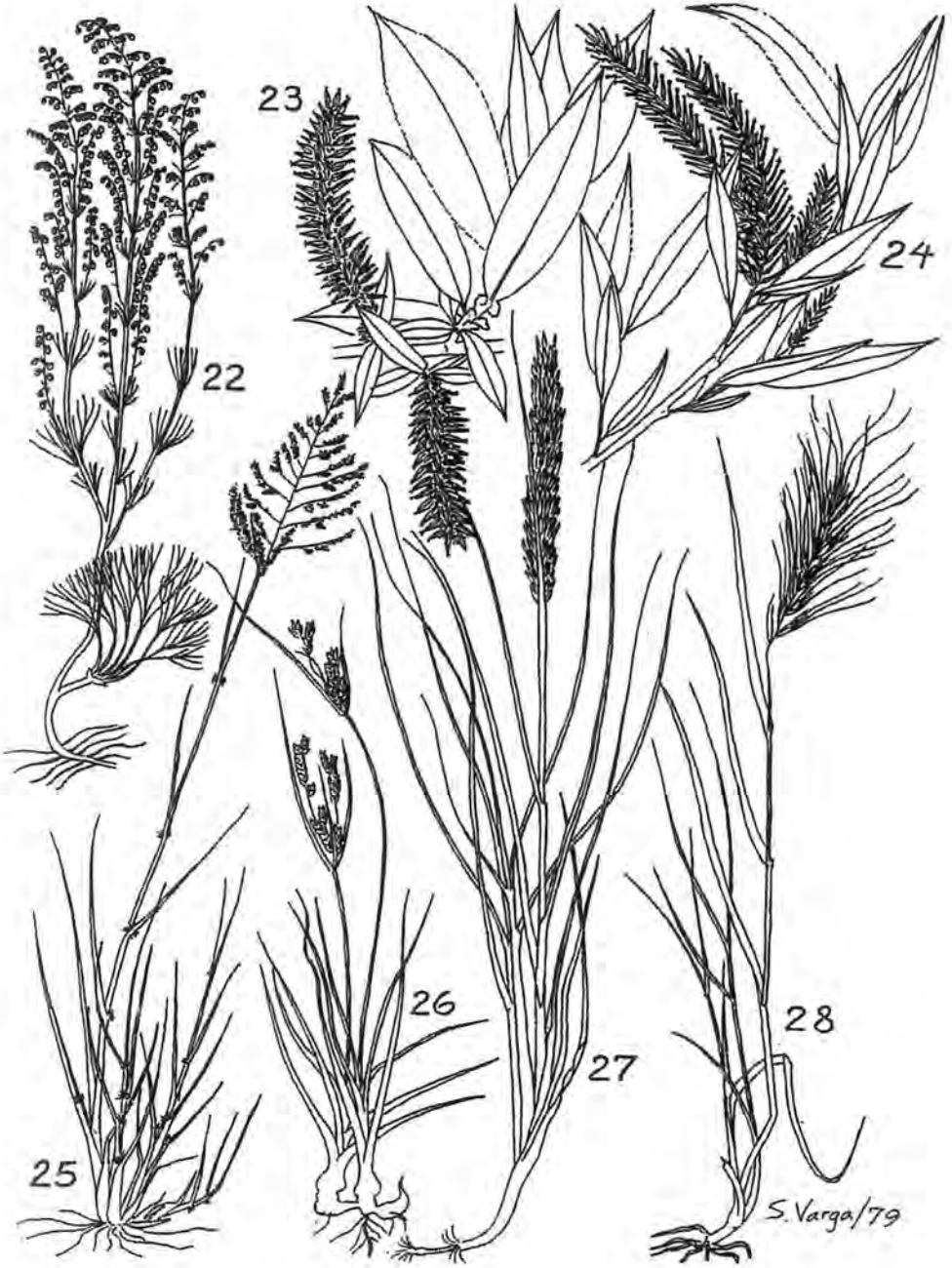
22 Artemisia campestris ssp. caudata
23 Salix eriocephala with female catkins
24 Salix exigua with female catkins
25 Sporobolus cryptandrus 26 Cyperus schweinitzii
27 Ammophila breviligulata 28 Elymus canadensis

Dunes



COTTONWOOD WOODLANDS (cont'd)

This woodland has developed on old dune systems, but could do just as well on new land created by sand fill. For example, sandy areas on the Leslie Street Spit are being rapidly colonized by Eastern Cottonwood probably introduced as seeds blown from the Toronto Islands. During July the Eastern Cottonwood seeds, which have long white hairs that act like parachutes, fill the sky. In some places they pile up on the ground to depths of 15 cm.

The most noteworthy woodland herb is the CUP PLANT (Silphium perfoliatum - 30). This sunflower-like plant is confined to a small colony along the woodland edge abutting the western side of the Metro Parks work yard. Native populations are restricted in Ontario to the Thames River Valley near London and to High Park in Toronto; however, the Cup Plant is known to spread from cultivation.

SAND PRAIRIES

Sand prairies occur in woodland openings on the northwestern corner of Mugg's Island, around wet meadows 4 and 5, and west of the Metro Parks work yard.

Two grass species, typical of the Tall-grass Prairie of the Midwest, dominate these sand prairies. BIG BLUESTEM (Andropogon gerardii - 34) is largely confined to the moister openings while SWITCH GRASS (Panicum virgatum - 35) prefers the drier openings. Big Bluestem is distinguished by its long cluster of flowers which spread out from a common centre. In contrast, Switch grass has its flowers on widely spreading stalks. A third species, CORD GRASS (Spartina pectinata - 32) is restricted to Mugg's Island.

Among the one to two-meter high grass tussocks can be found such common herbs as Wild Strawberry (Fragaria virginiana)

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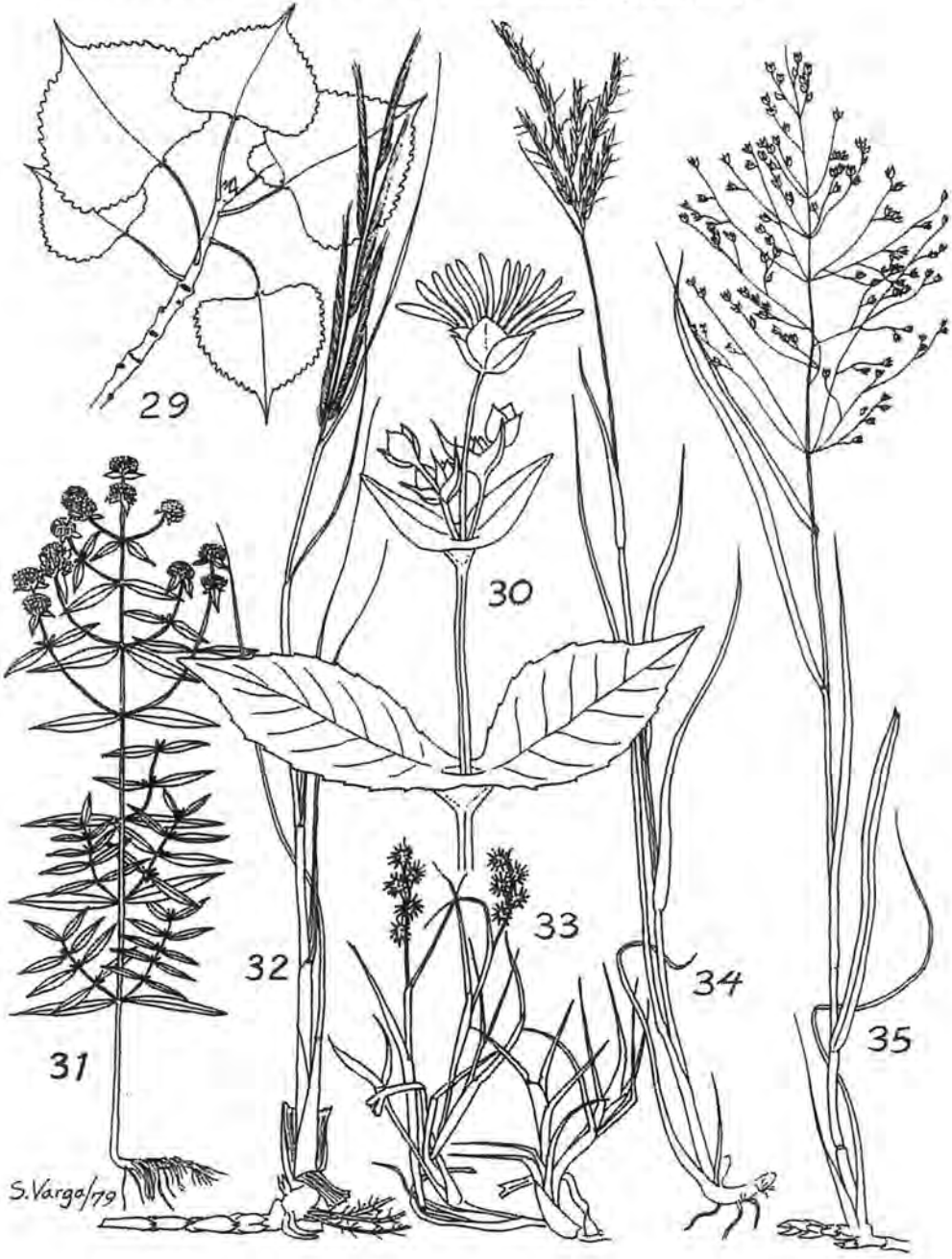
29 Populus deltoides
30 Silphium perfoliatum
31 Pycnanthemum virginianum
32 Spartina pectinata
33 Cenchrus longispinus
34 Andropogon gerardii
35 Panicum virgatum

Cottonwood woodlands & sand prairies



and Gray Goldenrod (Solidago nemoralis). Less frequently found is the regionally rare VIRGINIA MOUNTAIN MINT (Pycnanthemum virginianum - 31). This mint bears a cluster of small white flowers in July. It occurs in small colonies west of wet meadow 4.

One grass species which is particularly troublesome to humans is SANDBUR (Cenchrus longispinus - 33). Its presence is usually noticed when its sharp, spiny burs prick one's ankles. A nuisance of sandy areas in the United States, Sandbur appears to have been introduced to Ontario. On the Islands it is confined to a few clumps in the sand prairies; however, it also does well on the disturbed sands of the Metro Parks work yard.

CONSERVATION

The botanical significance of the Toronto Islands has been recognized by the City of Toronto which has designated the remaining natural areas "Environmental Resource Areas" and by the Metropolitan Toronto and Region Conservation Authority which has designated them "Environmentally Sensitive Areas".

Let us hope that the managers of the Islands, the Metropolitan Toronto government, will put forward a protection strategy for our region's most important botanical site.

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APPENDIX

REGIONALLY RARE PLANT SPECIES

In this guide, "our region" refers to the Regional Municipalities of York and Metropolitan Toronto, formerly known as York County.

In the following list, species marked * are unknown elsewhere in our region; species marked ** are provincially rare.

	Beach Strands	Dunes	Wet Meadows	Lagoon Edges	Woodlands, Sand Prairies
Agalinus purpurea (Purple Gerardia)			+		
*Ammophila breviligulata (Marram Grass)		+			
Aster laevis (Smooth Aster)					+
*A. pringlei (Pringle's Aster)					+
A. urophyllus (Arrow-leaved Aster)					+
Cakile edentula var. lacustris (Sea Rocket)	+				
Carex aquatilis (a sedge)			+	+	
C. fluviatilis				+	
*C. garberi			+		
*C. viridula			+		
Cyperus engelmannii (Engelmann's Umbrella-sedge)	+				
*C. schweinitzii		+			

RARE PLANTS (cont'd)

	Beach Strands	Dunes	Wet Meadows	Lagoon Edges	Woodlands, Sand Prairies
Eleocharis elliptica (a spikerush)			+		
*E. pauciflora			+	+	
*Equisetum X nelsonii (Nelson's Horsetail)			+	+	
Euphorbia polygonifolia (Seaside Spurge)	+				
Gentiana crinita (Fringed Gentian)			+		
Hypericum majus (a St. John's-wort)			+		
*Juncus acuminatus (a rush)			+		
J. alpinus			+		
J. balticus (Baltic Rush)			+	+	
*J. brachycephalus			+		
Lindernia dubia (False Pimpernel)			+		
Lobelia kalmii (Kalm's Lobelia)			+		
Oenothera oakesiana (an evening-primrose)		+			
*O. villosa		+			
*Panicum flexile (Wiry Witch Grass)			+		
P. virgatum (Switch Grass)		+			+
Physostegia virginiana (False Dragonhead)			+	+	
Potamogeton gramineus (a pondweed)			+		
P. perfoliatus var. richardsonii				+	

RARE PLANTS (cont'd)

	Beach Strands	Dunes	Wet Meadows	Lagoon Edges	Woodlands, Sand Prairies
**Potentilla paradoxa (Bushy Cinquefoil)	+				
Pycnanthemum virginianum (Virginia Mountain Mint)					+
*Salix cordata (Heart-leaved Willow)		+			
***Scleria verticillata (Nut Rush)			+		
**Silphium perfoliatum (Cup Plant)					+
*Spartina pectinata (Cord Grass)					+
Spiranthes romanzoffiana (Hooded Ladies'-tresses)			+		
*Stachys palustris (Woundwort)			+	+	
Utricularia minor (a bladderwort)			+		
TOTAL	4	6	22	8	7

PLEASE!!!

Stay on the trails to minimize disturbance of fragile plant communities.

Do not collect plants, flowers or seeds. Bring back notes, sketches, photos and happy memories.

Carry away any garbage.

Toronto Field Naturalists

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