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INVENTORY, ASSESSMENT, AND RANKING OF NATURAL AREAS OF WALPOLE ISLAND

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Abstract. A two-year study was begun in 1985 to document and assess the highly significant natural history features of the Walpole Island Indian Reserve in southwestern Ontario, Canada. The northern part of the island complex, where extensive prairie, savannah, and hardwood communities remain, was divided into 30 areas. The southern part, consisting of agricultural lands and wetlands was not examined. Through intensive field study and literature search, over 800 vascular plant species have been recorded from Walpole. Of the total, 12% (97) are rare in Ontario, and 1% (8) are not known elsewhere in Canada. Ninety-two species of birds have been confirmed as breeding, including 27 rare and one threatened species. An additional 44 species are probable breeders. Twenty-six species of herptiles were recorded including five of which are rare or declining. Twenty-four species of mammals have been recorded, including one rare species. Fifty-nine species of butterflies are known from Walpole Island, six of which are rare in Ontario. The results of this study confirm that Walpole Island contains the most significant tallgrass prairie and oak sa-

vannah, and associated flora and fauna remaining in Canada. Using six criteria, the 30 areas of the Island were prioritized to provide the native people with a rationale for future conservation strategies.

Key Words. prairie, savannah, prairie/forest transition, inventory, Walpole Island, Ontario

INTRODUCTION

Walpole Island is part of a large delta island complex situated at the mouth of the St. Clair River at the north end of Lake St. Clair (Figure 1). Approximately one-third of the delta complex is made up of more than a dozen islands on the United States side of the border. The remaining two-thirds are made up of six islands on the Canadian side, with the St. Clair International Seaway being the main dividing line between Canada and the United States.

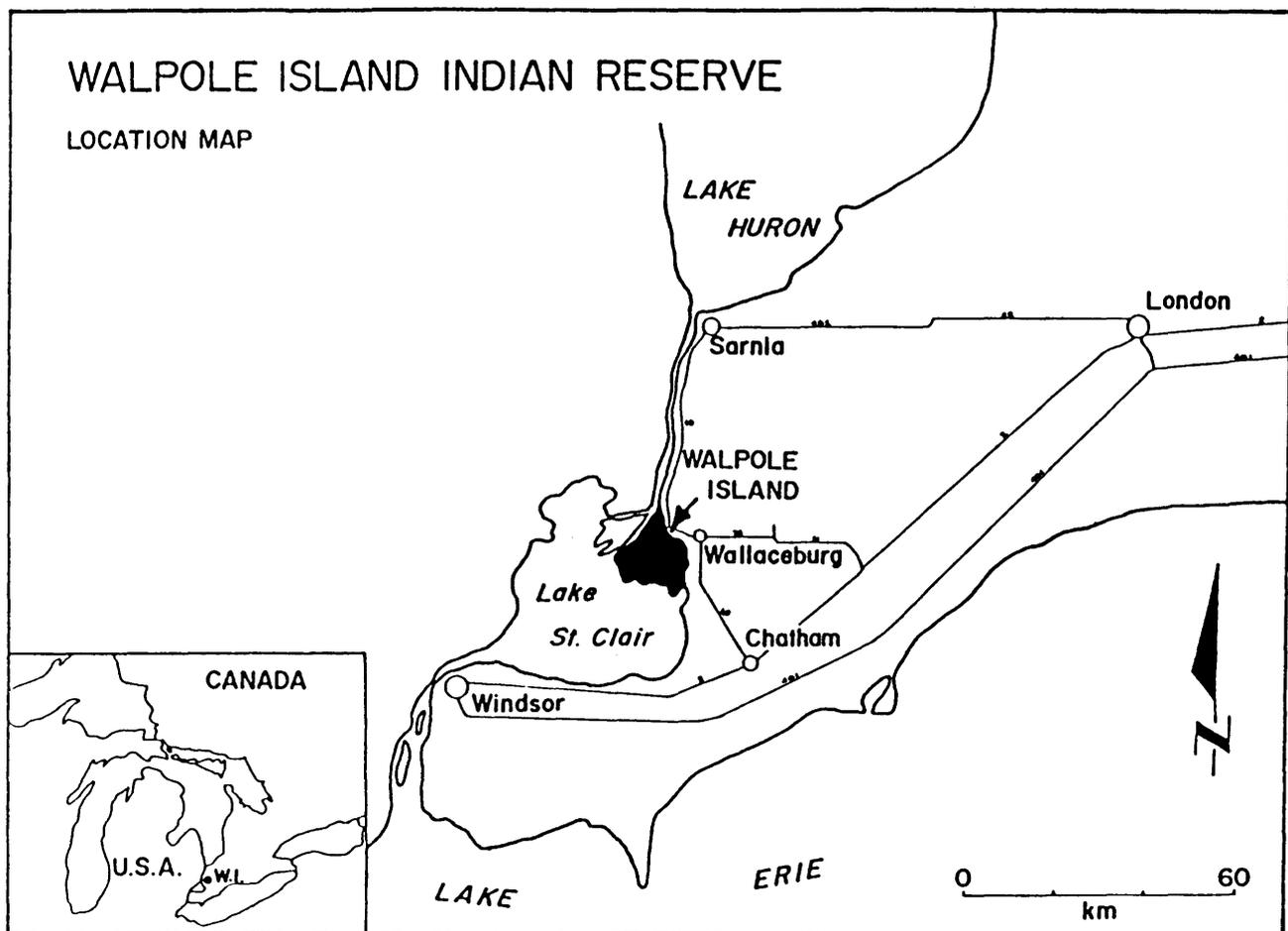


FIG. 1. Regional setting of Walpole Island Indian Reserve (from Hildebrand 1985).

The Canadian islands are wholly occupied by the Walpole Island Indian Reserve and cover approximately 24,000 ha. Almost 16,000 ha of the reserve are wetland, consisting of marshes, sloughs, channels, and the adjacent waters of Lake St. Clair. The remaining 8,000 ha, almost one-half of which are in agriculture, also include prairie, savannah, and hardwood forest. The Walpole Island Reserve is under the jurisdiction of the Walpole Island First Nation. All territory within the Reserve with the exception of public areas (ie. roads, waterways, beaches, buildings, etc.) are not generally open to the public unless otherwise posted. As a result, off-road sightseeing is strictly prohibited unless authorized by the Walpole Island Council and/or by individual private landowners.

Walpole Island has long been known for a rich mosaic of natural history features, including wetlands, wet woods, oak forest, oak savannah, and tallgrass prairie. It has been noted by the Carolinian Canada Identification Subcommittee as one of the top 36 unprotected natural areas in the Carolinian life zone of Canada (Eagles and Beechy 1985), and it was the only natural area which fulfilled all ten criteria used for selection.

Although Walpole Island is famous for its resources, no extensive surveys or documentation have taken place. Visits by naturalists have been sporadic over the decades due to the relative inaccessibility owing to its Indian Reserve status. In 1985, a two-year study was begun to carry out a natural history inventory of the terrestrial natural areas of Walpole Island was begun.

METHODS

The majority of the north one-half of Walpole Island could be considered a single natural area, the exceptions being land utilized for agriculture or residential development. However, for ease of documentation, the area was subdivided into 30 natural areas, each being separated by some distinct feature of the landscape such as a road or drainage channel. Each of these 30 natural areas contained some combination of prairie, savannah, and woodland. Original field data were collected for five different biotic groups: vegetation, birds, herptiles, mammals, and butterflies. In addition to data collection, efforts were made to search the literature, make contact with field naturalists or residents who had personal knowledge and information regarding Walpole Island, and to access the breeding bird atlas data.

Vegetation

Aerial photos were used to determine initially the variety of vegetative communities likely to be encountered in each natural area. At least two ground searches were then carried out in each community, to document both early to mid season and mid to late season species. Community descriptions were then written up. Community boundaries and significant species (i.e. those species listed in the most recent Atlas of the Rare Vascular Plants of Ontario) were noted on aerial photos and in field notes. A voucher specimen was collected for most significant or difficult to identify species. Photographic documentation was taken of significant flora and communities.

Several references were utilized for scientific names, in order to make use of recent taxonomic work. Lycopodiaceae to Dryopteridoideae followed Britton (1984 and 1985), Taxaceae to Iridaceae followed Voss (1972), except for the genus *Dichantheium* which followed Gould and Clark (1978), and the family Orchidaceae which followed Luer (1975). Saururaceae to Cornaceae followed Voss (1975). Pyrolaceae to Compositae followed Gleason and Cronquist (1963), except for *Solidago* and *Euthamia* which followed Semple and Ringius (1983).

Birds

Aerial photos were used initially to determine the communities likely to be encountered in each natural area. Morning ground searches were then conducted at random in each natural area at least once during the breeding season. In the more significant areas,

visits were made on two or more occasions in order to further document bird activity and confirm breeding. Additional observations were made during casual site visits and visits for other purposes. All species encountered were recorded with locations of significant species noted on aerial photos and in field notes. The level of breeding activity was recorded on standard atlas cards using the standard activity codes (Cadman *et al.* 1987). Most of the data were collected in 1986 only.

Herptiles

Field visits to each natural area to search for herptiles were made in conjunction with those made for vegetation and birds. Specific searches such as turning over logs and boards were made along with casual observations during field visits. Road-kills were also noted. All species were recorded with significant species being noted on air photos and in field notes.

Mammals

Field visits to each natural area to search for mammals were made in 1986 only. Trap lines using pitfall traps, snap traps, and live traps were employed to inventory small mammals. Other evidence (tracks, scats, and direct observations) were also noted during these and other field visits.

Butterflies

Each natural area was surveyed by volunteer lepidopterists primarily during the flight season in 1986 only. Random searches were made through each natural area. Efforts were also made to concentrate on some of the more significant plant host species, especially those suspected of being host to uncommon or rare butterflies. Casual observations were made on other field visits during the study. Specimens were caught and recorded.

RESULTS

Vegetation

More than 800 species of vascular plants are now known from Walpole Island. Of the total, 12% (97) are rare in Ontario (Argus *et al.* 1982-87) and 1% (8) are not known elsewhere in Canada (Table 1). A complete listing of the flora of Walpole Island is on file with the author.

Birds

A total of 138 species of birds are now known to be breeding or potentially breeding on Walpole Island. Of these, 92 species have been confirmed as breeding. Twenty-eight species (Table 2) are considered rare in Ontario, and 14 of these have been confirmed as breeding. One species, Henslow's sparrow (*Ammodramus henslowii*), is considered threatened by the Committee on the Status of Endangered Wildlife in Canada. A complete listing of the birds of Walpole Island is on file with the author.

Herptiles

A total of 26 species of reptiles and amphibians are now known from Walpole Island (Table 3). Of these, five species, queen snake (*Regina septemvittata*), eastern fox snake (*Elaphe vulpina*), Butler's garter snake (*Thamnophis butleri*), eastern spiny softshell turtle (*Trionyx spinifera*), and spotted turtle (*Clemmys guttata*), are considered to be rare or declining in Ontario (Ontario Ministry of Natural Resources 1983).

Mammals

A total of 24 species of mammals have been recorded for Walpole Island (Table 4). Of these, only the southern flying squirrel (*Glaucomys volans*) is considered rare in Ontario (Committee on the Status of Endangered Wildlife in Canada 1988).

Butterflies

A total of 59 species of butterflies were noted during the study. Of these, six species were considered to be at least rare in Ontario (Table 5). A complete listing of the butterflies of Walpole Island are on file with the author.

Table 1. Rare vascular plants of Walpole Island Indian Reserve (Allen and Oldham 1987, from Argus *et al.* 1982-87).

<i>Scientific Name</i>	<i>Common Name</i>	<i>Habitat</i>
<i>Eragrostis capillaris</i> (L.) Nees ¹	Lace grass	sandpit
<i>Koeleria cristata</i> (Ledeb.) Schultes	June grass	prairie/savannah
<i>Leptoloma cognatum</i> (Schultes) Chase	Fall witch grass	prairie
<i>Dichantherium clandestinum</i> (L.) Gould & Clark	Broadleaf panic grass	woods
<i>Dichantherium leibergii</i> (Vasey) Freckmann	Leiberg's panic grass	prairie
<i>Dichantherium praecocius</i> Hitchcock & Chase	Early-branching panic grass	prairie
<i>Dichantherium meridionale</i> Ashe ¹	Panic grass	prairie
<i>Dichantherium sphaerocarpon</i> (Ell.) Gould	Panic grass	prairie/savannah
<i>Sphenopholis obtusata</i> (Michx.) Scribn.	Early bunchgrass	prairie/savannah
<i>Stipa spartea</i> Trin.	Needle grass	prairie/savannah
<i>Bulbostylis capillaris</i> (L.) Clarke	Hair-like bulbostylis	disturbed area
<i>Carex bicknellii</i> Britton	Sedge	prairie
<i>Carex conoidea</i> Willd.	Sedge	prairie/savannah
<i>Carex emoryi</i> Dewey	Sedge	prairie
<i>Carex formosa</i> Dewey	Sedge	prairie/woods
<i>Carex gracilescens</i> Steudel	Sedge	prairie
<i>Carex meadii</i> Dew.	Sedge	prairie
<i>Carex muskingumensis</i> Schw.	Sedge	wet woods
<i>Carex suberecta</i> (Olney) Britt.	Sedge	prairie
<i>Carex swanii</i> (Fern.) Mack.	Sedge	savannah
<i>Carex tetanica</i> Schkuhr	Sedge	prairie
<i>Cyperus erythrorhizos</i> Muhl.	Red-rooted cyperus	savannah
<i>Fimbristylis spadicea</i> (L.) Vahl ¹	Fimbristylis	prairie
<i>Scirpus clintonii</i> Gray	Clinton's club-rush	prairie
<i>Scleria triglomerata</i> Michx.	Tall nut-rush	prairie
<i>Scleria verticillata</i> Muhl. ex Willd.	Low nut-rush	prairie
<i>Tradescantia ohioensis</i> Raf.	Ohio spiderwort	prairie/savannah
<i>Juncus acuminatus</i> Michx.	Sharp-fruited rush	prairie/disturbed area
<i>Juncus greenei</i> Oakes & Tuckerm.	Rush	prairie/savannah
<i>Aletris farinosa</i> L.	Colic-root	prairie/savannah
<i>Hypoxis hirsuta</i> (L.) Cov.	Yellow star-grass	prairie
<i>Sisyrinchium albidum</i> Raf.	Blue-eyed grass	prairie
<i>Aplectrum hyemale</i> (Muhl. ex Willd.) Nutt	Putty-root	woods
<i>Cypripedium candidum</i> Muhl. ex Willd.	Small white lady's-slipper	prairie
<i>Platanthera blephariglottis</i> (Willd.) Hooker	White-fringed orchid	roadside ditch
<i>Platanthera leucophaea</i> (Nutt.) Lindl.	Prairie white-fringed orchid	prairie
<i>Spiranthes lacera</i> Raf. var. <i>gracilis</i> (Bigel.) Luer	Southern slender ladies'-tresses	prairie
<i>Spiranthes magnicamporum</i> Sheriak	Great Plains ladies'-tresses	prairie/savannah
<i>Spiranthes ochroleuca</i> (Rydb. ex Britt.) Rydb.	Yellow ladies'-tresses	savannah]
<i>Spiranthes ovalis</i> Lindley ¹	Oval ladies'-tresses	prairie
<i>Carya laciniosa</i> (Michx. f.) Loud.	Big shellbark hickory	woods/savannah
<i>Quercus palustris</i> Muenchh.	Pin oak	woods/savannah]
<i>Polygonum tenue</i> Michx.	Knotweed	roadside/savannah
<i>Cerastium velutinum</i> Raf.	Chickweed	savannah
<i>Hydrastis canadensis</i> L.	Golden-seal	woods
<i>Thalictrum revolutum</i> D.C.	Waxy meadow-rue	savannah
<i>Liriodendron tulipifera</i> L.	Tulip-tree	woods
<i>Agrimonia parviflora</i> Ait.	Agrimony	prairie
<i>Geum vernum</i> (Raf.) Torr & Gray	Spring avens	prairie
<i>Rosa setigera</i> Michx.	Prairie rose	prairie/savannah
<i>Baptisia tinctoria</i> (L.) R. Br.	Wild indigo	prairie/savannah
<i>Desmodium rotundifolium</i> (Michx.) DC.	Prostrate tick-trefoil	woods
<i>Gymnocladus dioica</i> (L.) K. Koch	Kentucky coffee-tree	wood edge
<i>Lupinus perennis</i> L.	Wild lupine	savannah
<i>Vicia caroliniana</i> Walt	Carolina vetch	prairie/savannah
<i>Ptelea trifoliata</i> L.	Hop-tree	shorelines
<i>Polygala incarnata</i> L. ¹	Pink milkwort	prairie
<i>Aesculus glabra</i> Willd. ¹	Ohio buckeye	woods
<i>Lechea pulchella</i> Raf.	Pinweed	savannah
<i>Lechea villosa</i> Ell.	Hairy pinweed	savannah

Table 1. Continued

Scientific Name	Common Name	Habitat
<i>Hibiscus moscheutos</i> L.	Swamp rose mallow	marshes
<i>Lythrum alatum</i> Pursh	Wing-angled loosestrife	prairie
<i>Nyssa sylvatica</i> Marsh.	Black gum	roadsides
<i>Ludwigia polycarpa</i> Short & Peters	Many-seeded ludwigia	woods/disturbed
<i>Bartonia virginica</i> (L.) BSP.	Virginia bartonia	woods/disturbed areas
<i>Gentiana alba</i> Muhl.	White gentian	savannah
<i>Gentiana puberulenta</i> Pringle	Downy gentian	N/A
<i>Gentianella quinquefolia</i> (L.) Small	Stiff gentian	prairie/savannah
<i>Asclepias purpurascens</i> L.	Purple milkweed	prairie/savannah
<i>Asclepias sullivantii</i> Engelm.	Sullivant's milkweed	prairie
<i>Cuscuta cephalanthi</i> Engelm.	Dodder	prairie
<i>Cuscuta coryli</i> Engelm.	Dodder	prairie/savannah
<i>Phyla lanceolata</i> Michx.	Fog fruit	
<i>Blephilia ciliata</i> (L.) Benth.	Downy wood-mint	prairie
<i>Lycopus rubellus</i> Moench	Stalked water-horehound	woods
<i>Agalinis gattingeri</i> (Small) Small	Gattinger's agalinis	prairie
<i>Agalinis skinneriana</i> (Wood) Britt.	Skinner's agalinis	prairie
<i>Aureolaria pedicularia</i> (L.) Raf.	Fern-leaved false foxglove	savannah
<i>Veronicastrum virginicum</i> (L.) Farw.	Culver's-root	prairie/savannah
<i>Aster dumosus</i> L. var. <i>strictior</i> T. & G.	Bushy aster	prairie/savannah
<i>Aster praealtus</i> Poir. var. <i>praealtus</i>	Willow aster	prairie/savannah
<i>Bidens coronata</i> (L.) Britt	Southern tickseed	wetlands
<i>Cirsium hillii</i> (Canby) Fern	Hill's Thistle	prairie
<i>Coreopsis tripteris</i> L.	Tall coreopsis	prairie/savannah
<i>Eupatorium purpureum</i> L.	Purple-jointed joe-pye weed	woods
<i>Hieracium longipilum</i> Torr.	Long-bearded hawkweed	N/A
<i>Krigia biflora</i> (Walt.) Blake	Two-flowered cynthia	prairie/savannah
<i>Liatis aspera</i> Michx.	Rough blazing star	savannah
<i>Liatis spicata</i> (L.) Willd.	Dense blazing star	prairie/savannah
<i>Ratibida pinnata</i> (Vent.) Barnh.	Gray-headed coneflower	prairie
<i>Silphium terebinthinaceum</i> Jacq.	Prairie dock	prairie
<i>Solidago riddellii</i> Frank	Riddell's goldenrod	prairie
<i>Solidago rigida</i> L.	Stiff-leaved goldenrod	prairie/savannah
<i>Solidago speciosa</i> Nutt.	Showy goldenrod	prairie/savannah
<i>Vernonia gigantea</i> (Walt.) Trel. ex Banner & Coville	Tall ironweed	prairie/savannah

¹Only known Canadian location.

Table 2. Significant breeding birds of Walpole Island Indian Reserve.

Species	Breeding Status	Source ¹	Species	Breeding Status	Source ¹
Horned grebe	(+)	ORBB	Acadian flycatcher	+	ORBBP, MNR
Least bittern	*	ORBBP, MNR	Tufted titmouse	*	ORBBP
Great egret	(*)	ORBBP	Eastern bluebird	*	COSEWIC
Cattle egret	+	ORBBP	White-eyed vireo	+	ORBBP
Cooper's hawk	+	MNR, COSEWIC	Prothonotary warbler	+	ORBBP, MNR, COSEWIC
Bald eagle	+	ORBBP, MNR, COSEWIC	Louisiana waterthrush	+	ORBBP, MNR
Northern bobwhite	*		Hooded warbler	+	ORBBP, MNR
Canvasback	(*)	ORBBP, MNR	Yellow-breasted chat	+	ORBBP
Redhead	(*)	MNR	Yellow-headed blackbird	(+)	ORBBP, MNR
Northern shoveler	(+)	MNR	Orchard oriole	*	ORBBP
Ruddy duck	(+)	MNR	Henslow's sparrow	*	ORBBP, MNR, COSEWIC
Sandhill crane	(*)	ORBBP			
King rail	(*)	ORBBP, MNR, COSEWIC			
Little gull	(*)	ORBBP, MNR			
Forster's tern	(*)	ORBBP, MNR			
Caspian tern	(+)	ORBBP, MNR, COSEWIC			
Black tern	(*)	MNR			

* Confirmed breeding in study area

(*) Confirmed breeding on Walpole Island, but not in study area

+ Possible/probable breeding in study area

(+) possible/probable breeding on Walpole Island, but not in study area

¹Sources of significance status: MNR (Ministry of Natural Resources 1983), COSEWIC (Committee on the Status of Endangered Wildlife in Canada 1988), and ORBBP (Ontario Rare Breeding Bird Program 1989).

Table 3. Reptiles and amphibians of Walpole Island Indian Reserve.

Scientific Name	Common Name
<i>Notophthalmus viridescens</i>	Eastern newt
<i>Ambystoma tremblayi</i>	Tremblay's salamander
<i>Ambystoma laterale</i>	Blue-spotted salamander
<i>Bufo americanus</i>	American toad
<i>Hyla crucifer</i>	Spring peeper
<i>Hyla versicolor</i>	Tetraploid gray treefrog
<i>Pseudacris triseriata</i>	Striped chorus frog
<i>Rana pipiens</i>	Northern leopard frog
<i>Rana catesbeiana</i>	Bullfrog
<i>Chelydra serpentina</i>	Common snapping turtle
<i>Chrysemys picta</i>	Painted turtle
<i>Graptemys geographica</i>	Map turtle
<i>Emydoidea blandingi</i>	Blanding's turtle
<i>Clemmys guttata</i>	Spotted turtle
<i>Trionyx spiniferus</i>	Spiny softshell
<i>Eumeces fasciatus</i>	Five-lined skink
<i>Thamnophis sirtalis</i>	Common garter snake
<i>Thamnophis butleri</i>	Butler's garter snake
<i>Nerodia sipedon</i>	Northern water snake
<i>Regina septemvittata</i>	Queen snake
<i>Storeria dekayi</i>	Brown snake
<i>Opheodrys vernalis</i>	Smooth green snake
<i>Elaphe vulpina</i>	Fox snake
<i>Lampropeltis triangulum</i>	Milk snake
<i>Sistrurus catenatus</i>	Massasauga

Table 4. Mammals of the Walpole Island Indian Reserve.

Scientific Name	Common Name
<i>Sorex cinereus</i>	Masked shrew
<i>Blarina brevicauda</i>	Short-tailed shrew
<i>Eptesicus fuscus</i>	Big brown bat
<i>Lasiurus borealis</i>	Red bat
<i>Lepus europaeus</i>	European hare
<i>Sylvilagus floridanus</i>	Eastern cottontail
<i>Tamias striatus</i>	Eastern chipmunk
<i>Marmota monax</i>	Woodchuck
<i>Sciurus carolinensis</i>	Grey squirrel
<i>Tamiasciurus hudsonicus</i>	American red squirrel
<i>Glaucomys volans</i>	Southern flying squirrel
<i>Castor canadensis</i>	Beaver
<i>Peromyscus maniculatus</i>	Deer mouse
<i>Peromyscus leucopus</i>	White-footed mouse
<i>Microtus pennsylvanicus</i>	Meadow vole
<i>Ondatra zibethica</i>	Muskrat
<i>Canis latrans</i>	Coyote
<i>Vulpes vulpes</i>	Red fox
<i>Procyon lotor</i>	Raccoon
<i>Mustela erminea</i>	Short-tailed weasel
<i>Mustela vison</i>	Mink
<i>Taxidea taxus</i>	Badger
<i>Mephitis mephitis</i>	Striped skunk
<i>Odocoileus virginianus</i>	White-tailed deer

Table 5. Significant butterfly species of Walpole Island (From Kulon et al. 1987).

Scientific Name	Common Name
<i>Erynnis baptisiae</i>	Wild indigo duskywing
<i>Erynnis horatius</i>	Horace's duskywing
<i>Erynnis martialis</i>	Mottled duskywing
<i>Erynnis persius</i>	Hairy duskywing
<i>Poanes massasoit</i>	Mulberry wing
<i>Libytheana bachmanii</i>	Snout

DISCUSSION

This study confirmed that outstanding natural areas remain on Walpole Island. A majority of the rare flora and fauna are directly or indirectly associated with prairie or savannah communities. These communities are generally in superb condition, due to the regular practice of setting fire to these areas by the island residents. Fully one-third of the flora is made up of grasses, sedges, and composites. This assemblage of rare and more common prairie and savannah species, combined with the excellent overall condition of the communities which they make up, gives Walpole Island undoubtedly the distinction of harboring the most significant tallgrass prairie and oak savannah vegetation remaining in Canada.

As a result of this study, the best sites have been identified and ranked in order of priority. Six hundred and thirty-eight ha of portions of the original 30 natural areas have been selected to represent the areas in most need of protection. The majority of these areas are tallgrass prairie and oak savannah communities. A feasibility study is presently underway to investigate the possibility of conserving these significant properties through leasing or other arrangements with their respective landowners.

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