

**WALPOLE ISLAND
ECOSYSTEM RECOVERY STRATEGY**

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prepared by

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and

The Walpole Island Recovery Team

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DISCLAIMER

This draft of "*Walpole Island Ecosystem Recovery Strategy*" was prepared by Jane Bowles in consultation with the Walpole Island Recovery Team, members of the Walpole Island First Nation and others relative to a Conservation and Recovery Agreement that was entered into by Walpole Island First Nation and Environment Canada (Ontario Region) to develop an ecosystem-based recovery strategy for species at risk found on the lands and in the waters of Walpole Island First Nation. The purpose of this document is to identify recovery strategies and actions that are deemed necessary to conserve and recover prairie, savannah, forest, wetland and open water ecosystems of Walpole Island and the species they support. The goals, objectives and strategies outlined in the recovery document are subject to appropriations, priorities and budgetary constraints of the partners as well as to modifications resulting from new findings or changing objectives.

ABORIGINAL TREATY RIGHTS/LAND CLAIMS

Nothing in this Strategy shall:

- (1) be construed to diminish, derogate from, or prejudice any treaty or Aboriginal rights of the Walpole Island First Nation;
- (2) prejudice whatsoever any applications, negotiations or settlements with respect to land claims or land entitlements between Canada and the Walpole Island First Nation; or,
- (3) prejudice whatsoever the implementation of the inherent right to self-government nor prejudice in any way negotiations with respect to self-government involving the Walpole Island First Nation.

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EXECUTIVE SUMMARY

Walpole Island First Nation Environmental Philosophy Statement

“To preserve, enhance and maintain a mutual respect and to continue our beneficial dependency upon the environment we shall endeavor to co-exist with Mother Nature and protect this relationship. We the Walpole Island First Nation people pledge to use these resources to the mutual benefit of all peoples. We shall therefore ensure proper respect for all resources. As our elders have done we shall maintain laws that preserve our wildlife, lands and resources.”

Bkejwanong, meaning “Where the Waters Divide”, is located on a delta at the mouth of the St. Clair River in southwestern Ontario and is on the international boundary with Michigan, U.S.A. The Walpole Island First Nation (WIFN) consists of six islands that make up the Canadian portion of the delta. These islands cover approximately 24,000 ha of unceded territory and WIFN includes a further 11,000 ha of open water in Lake St. Clair. WIFN claims the whole of Lake St. Clair as well as land beyond the delta.

Walpole Island is in the species-rich Carolinian Zone of southern Ontario and supports a rich mosaic of natural areas, including some of the most biologically diverse areas remaining in Canada. These include Carolinian forest, open waters, one of the largest wetland systems in the Great Lakes Basin and large areas of rare tallgrass prairie and oak savannah. These features are of global importance and Walpole Island is recognized internationally for them. Highly populated and industrial areas surround Walpole Island. At the same time the population on Walpole Island is growing and demands for housing and infrastructure are increasing. Loss of habitat through land use change is one of the greatest threats to the ecosystems and the species that they support. Economically important activities such as hunting, fishing, farming and timber harvesting are also applying increasing pressures to natural ecosystems as the population grows.

There are over 50 plant and animal species collectively referred to as “Species at Risk” that occur in the 5 major ecosystems on Walpole Island that are listed as Extirpated, Endangered, Threatened or Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2004). Forty-five are listed under Schedule 1 of the Species at Risk Act (SARA). These numbers continue to increase.

The main reason species at risk and their habitats still exist on Walpole Island is because of the culture and traditions of the people of Walpole Island First Nation, therefore, an ecosystem approach is taken in this Recovery Strategy and co-existence between the people and the environment is the dominant theme. This Recovery Strategy seeks to develop First Nations instruments to support the principles of species protection, while maintaining jurisdiction over the Walpole Island Territory and exercising the inherent

rights accorded by occupation of the land from time immemorial and entrenched in Section 35-1 of the Canadian Constitution.

Threats to Species at Risk and their habitats are mainly loss of habitat. This results both from land use change and decline in habitat quality as a result of drainage alterations, succession and invasive species. Declines in First Nations traditions, language and culture are also important threats and barriers to recovery. Successful recovery will only be accomplished with the support of the Walpole Island Community.

The Recovery Goal is to conserve and recover the ecosystems of the Walpole Island Territory in a way that is compliant with the Walpole Island First Nation Environmental Philosophy Statement and provides opportunities for cultural and economic development, and protection and recovery for Canada's species at risk. There are six main recovery objectives outlined in this strategy. These are 1) involving the community in recovery planning and action; 2) developing First Nations instruments to implement recovery; 3) promoting stewardship and capacity building; 4) scientific research and monitoring of Species at Risk and their habitats; 5) building partnerships; and 6) exploring options for compensation of economic loss through recovery actions. Recovery actions are proposed and underway for all of these six recovery objectives.

The first step to recovery is to conserve the existing critical habitat for species at risk on Walpole Island. Reducing threats and beginning recovery through rehabilitation of degraded natural habitats is the next step. Reclamation of habitats that have been lost to land use change is the next level of recovery. Downlisting of species at risk is the ultimate goal of all recovery, but this will require recovery actions well beyond the undisputed boundaries of Walpole Island First Nation. Successful species at risk recovery on Walpole Island alone will not result in downlisting the species at the national level since the area of occupancy (Walpole Island First Nation) is so small. Several of the species involved are already not at all rare on Walpole Island itself. Recovery efforts on Walpole can, however, provide the seed, both literally and figuratively, for recovery over the whole of the Bkejwanong Territory. Walpole Island First Nation can take the lead in such recovery.

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INTRODUCTION

Walpole Island First Nation Environmental Philosophy Statement

“To preserve, enhance and maintain a mutual respect and to continue our beneficial dependency upon the environment we shall endeavor to co-exist with Mother Nature and protect this relationship. We the Walpole Island First Nation people pledge to use these resources to the mutual benefit of all peoples. We shall therefore ensure proper respect for all resources. As our elders have done we shall maintain laws that preserve our wildlife, lands and resources.”

Bkejwanong, meaning “Where the Waters Divide”, is located on a delta at the mouth of the St. Clair River in southwestern Ontario and is on the international boundary with Michigan, U.S.A. An elected Chief and Council governs about 3,840 Ojibway, Pottawatomi and Odawa (H. Dodge, pers. comm.). These three nations are known as the Three Fires Confederacy. Archeological finds on Walpole Island show seasonal occupation up to 3,500 years ago (Walpole Island Heritage Centre and Chreod Ltd., 1997a). Additional evidence indicates aboriginal occupation of the islands goes back at least 6,300 years, and experts agree that 9-11,000 years is not an unreasonable estimate (White, pers. comm.; Nin Da Waab Jig, 2003)

The Walpole Island First Nation (WIFN) consists of six islands that make up the Canadian portion of the delta. These islands cover approximately 24,000 ha, and WIFN includes a further 11,000 ha of open water in Lake St. Clair, adjacent to Lambton County and the Municipality of Chatham-Kent, Ontario. The current territory is unceded land and the boundaries have never been formally defined. WIFN claims the whole of Lake St. Clair as well as land beyond the delta islands (Walpole Island Heritage Centre and Chreod Ltd., 1997b).

Walpole Island is in the species-rich Carolinian Zone of southern Ontario and supports a rich mosaic of natural areas, including some of the most biologically diverse areas remaining in Canada. These include Carolinian forest, open waters, one of the largest wetland systems in the Great Lakes Basin and large areas of rare tallgrass prairie and oak savannah. These features are of global importance and Walpole Island is recognized internationally for them. These ecosystems provide habitat for many rare plant and animal species including some that occur nowhere else in Canada. The people of Walpole Island First Nation have lived off the land and successfully managed these ecosystems for thousands of years. Traditional philosophies, practices and values have contributed to the maintenance of these ecosystems on Walpole Island while they have been lost or severely fragmented on adjacent land.

Highly populated and industrial areas surround Walpole Island. The territory is part of the Great Lakes Basin where the St. Lawrence Seaway system carries the world past its shores. This provides opportunities for employment, trade and tourism, but it also presents challenges to protecting wildlife and

the ecosystems that they inhabit from these outside pressures. WIFN is downstream from “Chemical Valley”, a large concentration of petrochemical plants around Sarnia, Ontario. At the same time the population on Walpole Island itself is growing and demands for housing and infrastructure are increasing. Loss of habitat through land use change is one of the greatest threats to the ecosystems and the species that they support. Economically important activities such as hunting, fishing, farming and timber harvesting are also applying increasing pressures to natural ecosystems as the population grows.

There are over 50 plant and animal species collectively referred to as “Species at Risk” that occur in the 5 major ecosystems on Walpole Island that are listed as Extirpated, Endangered, Threatened or Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2004). Forty-five of these are listed under Schedule 1 of the federal Species at Risk Act (SARA). This number continues to increase. For several of these species Walpole Island remains the stronghold for their populations in Ontario. Several are found nowhere else in Canada. Many more plants and animals are considered rare in Ontario by the province’s Natural Heritage Information Centre (www.mnr.gov.on.ca/mnr/nhic) and are ranked S1 (critically imperiled) to S3 (rare). A list of these species is given in Appendix V.

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Timelines for the completion of recovery strategies (shown in Appendix II to IV) for species listed under Schedule 1 of the Species at Risk Act came into force on June 5, 2003. A recovery strategy for listed species must be prepared within the time limits. Since Species at Risk and their habitats cannot be separated from the culture and traditions of the people of Walpole Island First Nation, an ecosystem approach is taken in this Recovery Strategy. An ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (Convention on Biological Diversity, 1999).

The advantages of an ecosystem approach to recovery on Walpole Island include the following:

- it is consistent with First Nations values and traditions for the management of ecosystems and with the WIFN Environmental Philosophy Statement;
- actions can be selected to benefit several species including those that may not be listed;
- implementation is likely to be more cost effective than for single species;
- issues of scale can be addressed more easily;
- it identifies common threats;
- it helps ensure that actions taken to benefit one species do not adversely affect others; and
- it recognizes the interaction between humans, species at risk and their habitats.

Boersma *et al* (2001) showed that multi-species recovery plans have been less likely to succeed in improving species population than single species plans, mainly because resources may be spread too thinly. On the other hand, when several species at risk are concentrated in one area or occur in a particular habitat, an ecosystem approach to recovery appears more logical. Clarke and Harvey (2002) argue that recognition and mitigation of common threats is fundamental to successful recovery planning for multiple species or ecosystems.

In this Recovery Strategy, this philosophy is extended across all five ecosystems, with community involvement, respect and co-existence between the people and the environment as the dominant themes. The Goals of this Recovery Strategy reflect the priorities of the Walpole Island community that were identified from a series of focus groups, public meetings and feedback from earlier drafts. Members of the community want to see a Walpole Island of the future with clean air, clean water and protected green spaces. They are proud of the natural heritage features of Walpole Island. They see loss of language, culture and traditional practices as a major factor in detrimental changes that have taken place. They want to see the development of plans and policies that set a course for the future and they want to see the whole community, especially the youth engaged in the process.

Both Aboriginal Traditional Knowledge (ATK) and science provide valuable background information for species at risk and it is imperative that Walpole Island First Nation controls the direction set out in this Recovery Strategy and works out the issues within the community (Walpole Island Heritage Centre and Chreod Ltd., 1997a). Walpole Island First Nation supports the principles of conservation of species and their habitats that are embodied in the Species at Risk Act. This recovery strategy seeks to develop First Nations instruments to support these principles and to maintain jurisdiction over the Walpole Island Territory by exercising inherent rights accorded by occupation of the land from time immemorial and entrenched in Section 35-1 of the Canadian Constitution in which the aboriginal and treaty rights of the aboriginal peoples of Canada are recognized and affirmed.

According to the Federal Policy Discussion Paper on critical habitats (Environment Canada, 2004), First Nations are to be treated as a level of government and the use of S11 agreements to protect Species at Risk is appropriate. Under SARA, stewardship-type agreements are the preferred approach for securing effective protection on Indian Act Lands.

The Walpole Island First Nation Band Council and Environment Canada (Ontario Region) signed a Conservation and Recovery Agreement on December 31, 2001. This agreement committed the two parties to work together to produce a Recovery Strategy for the ecosystems and species at risk on Walpole Island. This nation-to-nation agreement was the first of its kind linking the Government of Canada and the Walpole Island First Nation in a combined effort to sustain and enhance the natural areas and species of Walpole Island. Environment Canada (Ontario Region) and the Walpole Island Heritage Centre are responsible for developing this strategy. A further agreement was signed in April 2005 outlining the species at risk recovery activities to be undertaken by WIFN and Environment Canada (Ontario Region) for a 1-year period. Funding is provided by Environment Canada.

The recovery strategy provides an opportunity for the community of Walpole Island to continue to lead in *the protection of species at risk over the whole of the Bkejwanong Territory, while maintaining its cultural, spiritual and economic relationship with the natural environment.* Because the area of Walpole Island is so small, Species at Risk recovery on Walpole is unlikely to alter the status of species whose area of occupancy is limited to Walpole Island First Nation. Several of the species involved are already not at all rare on Walpole Island itself. Downlisting of these species, the ultimate goal of all recovery, will require recovery efforts outside Walpole Island.

Background information used in the preparation of this recovery strategy includes COSEWIC status reports for listed species, a life science inventory of natural areas on Walpole Island (Woodliffe and Allen, 1998), a ranking of the top natural heritage sites on Walpole Island (Woodliffe and Allen, 2003) and various reports listed in the bibliography that are on file at the Walpole Island Heritage Centre.

I BACKGROUND

1. ECOSYSTEM AND HABITAT INFORMATION

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The islands of Walpole Island First Nation form part of what has been described as “a splendid example of a bird’s-foot delta”, with channels that spread from north to south (Chapman and Putnam, 1984). Generally the land is flat and low-lying, but highest at the north end of the delta and around the edge. Poor drainage due to high water levels is prevalent throughout the islands. A series of dykes separates the land from extensive marshes to the south that make up most of the delta.

The deltaic deposits of Walpole Island form a complex of gently grading ridges and sloughs with different moisture regimes that support a diversity of vegetation communities (Woodliffe and Allen, 1998). The deposits are composed mainly of fine to medium sands and coarse silts that have been carried down the St. Clair River (Ecologistics, 1979). The soils of Walpole Island have these deposits as their parent materials and are mostly imperfectly to poorly drained fine sandy loams, but pockets of sand are present at the north end of the island. Low-lying wet areas have additional silt and loams (Ecologistics, 1979). Soils that have developed under prairie are very distinctive and are well represented on Walpole Island (Faber-Langendoen and Maycock, 1987).

Tallgrass Prairies (mshkode) have a tree cover of generally less than 10% and are dominated by grasses, sedges and wildflowers, many of them specialists of prairie habitat. Historically prairies covered huge expanses of North America east of the Rocky Mountains. Tallgrass prairies, which occupied the eastern portions of the prairie where rainfall is highest, extended over about 100,000 hectares through southern Ontario. Plant assemblages in prairies are extremely diverse, but grasses such as Big Bluestem (*Andropogon gerardii*) and Indian Grass (*Sorghastrum nutans*) are very often dominant. Prairies are

maintained by a combination of fire and grazing that prevents tree encroachment. Following European settlement much of the tallgrass prairie was converted to farmland. Today less than 1% of the original prairies remain in Ontario, the largest and best known remnants being at Walpole Island and at Windsor.

Most of the prairies on Walpole Island are in excellent condition because of the regular burns that occur. They represent the most outstanding prairie in Ontario, with the greatest species richness (Draper *et al*, 2002) and a high concentration of rare species. There are 110 prairie indicator plant species that have been recorded here. The associations present represent those that existed prior to European settlement. Aboriginal land uses have continued to the present. Many areas have never been logged or plowed and frequent burns have occurred. The tallgrass prairies in Ontario are at the eastern edge of their range, with higher rainfall than further west. This means that woody growth is faster. Without fire to suppress the trees, prairie can quickly change to savannah and savannah to woodland. This is particularly true on Walpole Island where the water table is relatively high (Woodliffe and Allen, 1998; Woodliffe, 2000). Some prairies may have expanded since the First Nations started maintaining a permanent settlement and agriculture on the islands in the early 1800s, but many areas have been lost to agriculture and development. In the last 25 years, estimates from 1972 and 1998 air photos suggest that prairies at Walpole Island have been reduced from about 730 ha to about 470 ha, a loss of 36% (Crow *et al*, 2003). Some of this is a result of conversion to agriculture and housing, but most is due to encroachment by forest and woodland in the absence of regular fires.

All the prairie vegetation types and Ecosites that are found on Walpole Island are considered extremely rare in Ontario and have a provincial ranking of S1 (5 or fewer occurrences in the province of very few remaining hectares) (Bakowsky, 1997). Woodliffe and Allen (2003) identified and ranked 17 of the top prairie sites, but almost all prairie pockets are important to protect species and maintain linkages and connections across all the Walpole prairies.

Savannahs (jiiigaakwa) are transitional between prairie and forest, but maintain many prairie elements that are absent from forests (Lee *et al*, 1998). Tree cover is higher than in prairies, but the canopy is not closed as it is in a forest. Many sun-requiring prairie species are present, but some savannah specialists grow under the shade of the trees and are not found in open prairie. The dominant trees that characterize savannahs in Ontario are oaks. Prior to European settlement oak savannahs covered some 12 million hectares, but this has been reduced to about 0.02%. Like prairies, periodic grazing and fire maintain savannahs.

Walpole Island contains some of the most significant areas of oak savannah remaining in Canada. Increasing development on Walpole Island means that the use of fire to manage and maintain savannahs has been reduced. An estimated 570 ha of oak savannah in 1972, based on aerial photography, was

reduced to some 360 ha by 1998, a 37% loss mainly attributable to closing in of the tree canopy (Crow et al. 2003).

All oak savannah vegetation types are considered extremely rare in Ontario with a provincial ranking of S1 (5 or fewer occurrences in the province of very few remaining hectares) (Bakowsky, 1997).

Carolinian Forests (mtigwaaki) that make up the Eastern Deciduous Forests of North America are the dominant forest in the eastern United States (Greller, 1988). They extend from the Carolinas in the south and reach their northern limit in the extreme south of Ontario, south of a line from Grand Bend to Toronto. Carolinian forests are the richest forest ecosystem in Canada and include many species that are found nowhere else in the country. On Walpole Island, forest and woodland occupy some 1780 ha, much of it on wetter soils, but not all of this is well-developed, mature Carolinian forest. The amount of forest on Walpole Island has increased almost 400 ha since 1972 as a result of the growing in of savannah (Crow et al, 2003). These younger forests are losing or have lost the characteristic savannah elements and do not have the same structural and species diversity as older forest ecosystems. For recovery and management purposes it is important to distinguish the areas that should be protected as “true” forest from treed areas that are overgrown savannahs that may need to be restored.

Wetlands (waabshkoki) are areas that have standing water at or above the soil surface for a substantial portion of the year. Many wetlands draw down and are dry in summer, but they can be recognized by the characteristic wetland soils and the presence of plant species that are wetland specialists (Lee et al, 1997). Walpole Island First Nation contains over 12,000 hectares of World Class Wetlands, one of the largest wetland complexes in the Great Lake Basin, composed primarily of cattail and sedge marshes, swamps and swales (The Nature Conservancy, 1995). The wetlands on Walpole Island are an enormously important resource that forms the economic base of the community through fishing, hunting and harvesting other aquatic life. The marshes at the south end of Walpole Island are an important staging area for migrating waterfowl on the Atlantic and Central Mississippi flyways. Since European settlement some 88% of the original wetlands in Lambton County and the Municipality of Chatham-Kent have been drained (Snell, 1987). On Walpole, St. Anne, Squirrel and Pottawatami Islands of the Walpole Island First Nation more than 3,600 hectares of the original wetlands have been drained and converted to farmland since the 1920s.

Open water communities (gaaming miiinwa siiibiing) of Walpole Island First Nation occupy the south channel of the St. Clair River, the Basset Channel, the Johnston Channel and the Chenail Ecarte (The Snye) as well as Goose Lake and many smaller openings in the marshes. In the south the marshes open up and grade into several square kilometers of open water in Lake St. Clair including Walpole and Johnston Bays. These open water areas share their economic and ecological importance with the

wetlands. Most of the banks of the St. Clair River and Chenal Ecarte are hardened. The St. Clair River is an important shipping channel, the gateway to the upper Great Lakes. The chemical industries upstream in Sarnia and Port Huron are major sources of actual and potential pollution. In the 1970s pollutant levels in the river were high enough to be a danger to public health and the Lake St. Clair fishery was closed (Walpole Island Heritage Centre and Cherod Ltd., 1997a). By the late 1980s most toxins entering the river were from accidental spills and the fishery was reopened, although there are still suggested limits on the consumption of fish and wildlife. The Sydenham River, one of the biologically rich rivers in southern Ontario, enters the Chenail Ecarte opposite St. Anne Island. In addition to waterfowl and fish, the freshwater mussel population is particularly diverse and important in the Sydenham River and Lake St. Clair and includes several species at risk. What appears to be an important refugium for freshwater mussels from Zebra Mussel infestations has been found in the waters of WIFN (Metcalf-Smith, pers. comm., 2003).

2. SPECIES INFORMATION

The following table lists species at risk that have recorded occurrences on the land and in the waters of WIFN. The approximate percent of the Canadian population that occurs on Walpole Island First Nation is indicated. Walpole Island has a greater responsibility to protect species for which a high percent of the Canadian population occurs on WIFN. The ecosystem(s) where the species are found is indicated. COSEWIC Status, according to the Committee on the Status of Endangered Wildlife in Canada is indicated as follows: END = Endangered: THR = Threatened: SC = Special Concern; EXT = Extirpated; REV = Under Review

SPECIES	SCIENTIFIC NAME	NISHNAABEMWIN NAME	COSEWIC	% of Canadian Population at WIFN	Ecosystem				
					Prairie	Savannah	Forest	Wetland	Open Waters
Plants		Zaagkigoog							
Gattinger's Agalinis	<i>Agalinis gattingeri</i>		END	<5%	X				
Small White Lady's-slipper	<i>Cypripedium candidum</i>	Coo coom mkazin	END	<10%	X	X			
White Prairie Gentian	<i>Gentiana alba</i>		END	100%		X			
Butternut	<i>Juglans cinerea</i>		END	<1%			X		
Pink Milkwort	<i>Polygala incarnata</i>		END	>95%	X	X			
Eastern Prairie White Fringed-orchid	<i>Platanthera leucophaea</i>		END	<10%	X	X			
Showy Goldenrod	<i>Solidago speciosa</i>	Azaawaabigwan	END	100%		X			
Skinner's Agalinis	<i>Agalinis skinneriana</i>		END	c. 90%	X				
Colicroot	<i>Aletris farinosa</i>	Miishkoon nangoons	THR	c. 10%	X	X			
Kentucky Coffee Tree	<i>Gymnocladus dioicus</i>		THR	c. 10%		X	X		
Goldenseal	<i>Hydrastis canadensis</i>	Mne mne tthibek	THR	c. 30%			X		
Dense Blazingstar	<i>Liatris spicata</i>		THR	c. 80%	X	X			
Common Hop-tree	<i>Ptelea trifoliata</i>		THR	<1%		X			

SPECIES	SCIENTIFIC NAME	NISHNAABEMWIN NAME	COSEWIC	% of Canadian Population at WIFN	Ecosystem				
					Prairie	Savannah	Forest	Wetland	Open Waters
Willowleaf Aster	<i>Symphyotrichum praelatum</i>		THR	c.10%	X	X			
Climbing Prairie Rose	<i>Rosa setigera</i>	Bizhkiwigini	SC	c10%	X	X			
Riddell's Goldenrod	<i>Solidago riddellii</i>		SC	c. 10%	X	X			
Swamp Rose-mallow	<i>Hibiscus moscheutos</i>		SC	>5%				X	X
Shumard's Oak	<i>Quercus shumardii</i>	Miizhmizh	SC	<1%		X	X		
Birds		Bneshiinyag							
Greater Prairie Chicken	<i>Tympanuchus cupido</i>		EXT	Historic					
Henslow's Sparrow	<i>Ammodramus henslowii</i>	Gumwin bneshiiah	END	?	X				
Northern Bobwhite	<i>Colinus virginianus</i>	She kadabnaa	END	?	X	X			
Acadian flycatcher	<i>Empidonax virescens</i>		END	?			X		
King Rail	<i>Rallus elegans</i>	Moo kaa saapa	END	?				X	X
Least Bittern	<i>Ixobrychus exilis</i>	Moosh kagoom	THR	?10%				X	
Hooded Warbler	<i>Wilsonia citrina</i>		THR	?			X		
Cerulean Warbler	<i>Dendroica cerulea</i>		SC	?			X		
Eastern Yellow-breasted Chat	<i>Icteria virens virens</i>		SC	?					
Red-headed Woodpecker	<i>Melanerpes</i>	Baa paa se	SC	?		X	X		
Louisiana Waterthrush	<i>Seiurus motacilla</i>		SC	?			X		
Mammals		Wesiinyag							
Southern Flying Squirrel	<i>Glaucomys volans</i>	Shuhgush kauduh	SC				X		
Reptiles		Zhignebig							
Eastern Massasauga	<i>Sistrurus catenatus</i>	Wahbunoongn zhenuhwa	END	Historic	X	X		X	
Eastern Fox Snake	<i>Elaphe vulpina gloydi</i>		THR	<10%	X	X	X	X	
Queen Snake	<i>Regina septemvittata</i>	Kimakaqua nabgosh	THR	?				X	X
Butler's Garter Snake	<i>Thamnophis butleri</i>	Wenda gnebig	THR	<10%	X	X	X		
Spotted Turtle	<i>Clemmys guttata</i>	Mooskadoo	END	?				X	
Eastern Spiny Softshell	<i>Apalone spinifera spinifera</i>	Nookzi kinaak	THR	?1%				X	X
Stinkpot	<i>Sternotherus odoratus</i>		THR	?				X	X
Northern Map Turtle	<i>Graptemys geographica</i>		SC	?				X	X
Eastern Milksnake	<i>Lampropeltis triangulum</i>		SC	?			X		
Five-line Skink	<i>Eumeces fasciatus</i>	Kaadignebig	SC	?1%		X	X		
Fishes		Giigoonyag							
Pugnose Shiner	<i>Notropis anogenus</i>		END	?				X	X
Northern Madtom	<i>Noturus stigmosus</i>	Mon meg	END	?				X	X
Lake Chubsucker	<i>Erimyzon sucetta</i>		THR	?				X	X
Spotted Sucker	<i>Minytrema melanops</i>	Nmebneh gaade	SC	?>50%				X	X
Channel Darter	<i>Percina copelandi</i>	Geegoons	THR	?				X	X
Lepidoptera		Memengwaanyag							
Monarch Butterfly	<i>Danaus plexippus</i>	Memengwenh	SC		X	X	X	X	
Molluscs									
Northern Riffleshell	<i>Epioblasma torulosa</i>		END	<1%					X
Wavy-rayed Lampmussel	<i>Lampsilis fasciola</i>		END	EXT					X

SPECIES	SCIENTIFIC NAME	NISHNAABEMWIN NAME	COSEWIC	% of Canadian Population at WIFN	Ecosystem				
					Prairie	Savannah	Forest	Wetland	Open Waters
Round Hickorynut	<i>Obovania subrotunda</i>		END	?90%					X
Round Pigtoe	<i>Pleurobema sintoxia</i>		END						X
Kidneyshell	<i>Ptychobranchus fasciolaris</i>		END	?50%					X
Rayed Bean	<i>Villosa fabalis</i>		END	?0%					X

3. THREATS

The threats to the Walpole Island ecosystems listed below have been identified through input from knowledgeable individuals within and outside the community, from community feedback from questionnaires, and from threats identified from COSEWIC species status reports. Threats are identified mainly at the ecosystem or habitat level and are specific to Walpole Island, although they may threaten similar species and habitats elsewhere. Threats specific to individual species are identified in the species recovery strategies attached as addenda to this document. For each threat, the main ecosystems that are likely to be affected have been identified and an indication as to whether it is a direct threat to species populations, or their habitat is indicated. Other threats, or more specific threats may be identified during the development of recovery plans.

Threats	Notes	Ecosystem Affected					Threat to	
		Prairie	Savannah	Forest	Wetland	Open water	Habitat	Species
Land use planning and designation	• Development on Walpole Island First Nation is currently somewhat haphazard. There is no official designation for conservation land or protected areas.	X	X	X			X	
	• The Capital Planning Study and its updates do not incorporate natural ecosystems or "green infrastructure planning".	X	X	X			X	
	• There is no comprehensive management or land use plan for Walpole Island First Nation	X	X	X	X		X	
	• There is no enforceable bylaw or policy to protect significant areas that have been identified.	X	X	X			X	
	• There is no infrastructure to implement and oversee plans and policies.	X	X	X			X	
Land use change	• Population and the need for houses is increasing. Development and infrastructure is increasing, often at the expense of natural areas.	X	X	X			X	
	• Some natural areas are converted to agriculture.	X	X	X			X	X
Decline in tradition, language and culture	• Traditional connections with the land are being lost.	X	X	X	X	X	X	X
	• There are few remaining fluent speakers of native languages and most are middle-aged or elderly.	X	X	X	X	X	X	X
	• Traditions, language and knowledge of the land are not always being passed down to younger generations.	X	X	X	X	X	X	X
	• Most people do not even know the names of the plants and animals in their native language.	X	X	X	X	X		X
Lack of awareness	• Acquired cultures of consumerism dominate including such practices as mowing and manicuring land.	X	X	X			X	X

Threats	Notes	Ecosystem Affected					Threat to	
		Prairie	Savannah	Forest	Wetland	Open water	Habitat	Species
Lack of awareness	• There is little appreciation of the value of prairies, which are know colloquially as “the weeds”.	X	X				X	
	• There is a perception of a treed landscape being a desired recovery goal.	X					X	
Land tenure	• Non-traditional private ownership of land limits community control over land use.	X	X	X			X	
	• Land is divided into smaller and smaller parcels as it is handed down from generation to generation. Land management is more difficult.	X	X	X			X	
	• Scattered individual land parcels of natural areas are used for houses as population increases	X	X	X			X	X
	• There is no real long-term protection guaranteed for land set aside for conservation.	X	X	X			X	
Invasive species	• <i>Phragmites</i> is a major and rapid invader of wetland and moist prairies with significant spread on Walpole Island in the last 20 years.	X			X	X	X	X
	• Hybrid Cattail covers many hectares of shallow marshes				X		X	
	• Purple Loosestrife has invaded many marshes and wetlands, but the threat appears to be receding under the invasion of <i>Phragmites</i> .				X		X	
	• Sweet White Clover invades prairies along tracks and edges	X	X				X	
	• Garlic Mustard was first recorded in 2003. It poses a threat to ground layer diversity in woodlands.			X			X	
	• Black Locust is an important invader in some prairies and savannahs.	X	X	X			X	
	• Emerald Ash Borer was confirmed in 2005 and is a threat to forest ecology where ash is an important component of the canopy, and to traditional crafts where Black Ash is used.			X			X	X
	• Mute swans are affecting wildfowl populations that are important to the local economy.							
Drainage and dykes	• Zebra mussels have decimated clam populations in waters around Lake St. Clair.				X	X		X
	• Over 6,200 ha of wetlands in WIFN have been drained and converted to agriculture since the 1900s.				X		X	X
	• Ditches and tile drains lower the water table and drain moist prairies and swamps.	X		X			X	X
	• Dyking causes changes in water level fluctuations and affects marsh processes.				X		X	
	• Dykes limit species movement, causing loss of species richness and change in species composition. Sensitive species are affected most.				X	X	X	X
Lack of fire management	• Walpole Island has no policies and no formal agreements to coordinate water level management in different areas.				X		X	
	• Lack of fire and fire suppression results in natural succession of prairie and savannah and conversion of these habitats to forest.	X	X				X	X
	• Uncontrolled fires pose a danger to property and people that increases with intensity of development	X	X	X			X	
	• Many fires are not planned as part of a management plan. Arson is common.	X	X				X	
	• Fire impacts forest habitats, species and value for timber			X			X	X
Sand extraction	• During burning in spring complaints of air pollution are received from neighbouring communities						X	
	• The major sand source on WIFN is adjacent to important savannah and prairie habitat. Sand extraction removes habitat. Snake hibernacula have been found in active sand piles.	X	X				X	X

Threats	Notes	Ecosystem Affected					Threat to	
		Prairie	Savannah	Forest	Wetland	Open water	Habitat	Species
Logging	• Logging for income on private land often does not follow the WIFN Forest Management Policy or conform to best management practices.			X			X	
Logging	• Poor logging practices damages habitat and disturbs wildlife and habitat			X			X	X
Pollution and climate change	• Pollution of lakes and rivers may directly affect aquatic organism and contribute to degraded system on land and water.				X	X	X	X
	• Wildlife and humans higher up the food chain are affected by build-up of contaminants.	X	X	X	X	X		X
	• Water pollution levels have decreased over the last 30 years, but spills from lake traffic and upstream chemical works are a constant threat.				X	X	X	X
	• Pesticide disposal and agricultural overspray affect organisms in natural areas and leak into and ground water.	X	X	X	X	X	X	X
	• The garbage dump is not properly controlled. Garbage fires are frequent releasing dioxins and other contaminants.	X					X	X
	• Inland sources of silt (e.g. Sydenham River) affect water quality in coastal systems and may directly affect some species				X	X	X	X
	• Predicted climate change and lowering of lake levels will affect shoreline ecosystems and alter drainage on land.	X	X	X	X	X	X	X
Recreation and Eco-tourism	• Eco-tourism presents opportunities for revenue generation, but trespass is common and causes conflict and resentment.	X	X	X	X	X	X	X
	• Trampling by off-road vehicles is a problem in some areas.	X	X				X	X
	• Very rare species may be threatened by plant collectors and poachers	X	X	X	X	X		X
Harvest of traditional plant species	• Harvest of some species (e.g Sweetgrass) is done for cash and is not coordinated or controlled by the community. Harvest levels may not be sustainable.	X	X	X	X	X	X	X
	• Trampling during harvest may damage habitat or to other species.	X	X	X			X	X
Hybridization	• Some species-at-risk hybridize with common species in same genus e.g. White Gentian, Small White Lady's-slipper	X	X					X
Seed predation	• Some plant species at risk are suffering significant pre-dispersal seed predation but unknown insects.	X	X					X
Lack of status reports	• There is incomplete knowledge and unbalanced reporting of many very rare species. Many have not had status reports done and are not listed by COSEWIC or under the specie-at-risk act., so do not receive attention.	X	X	X	X	X		X

4. CULTURAL, ECOLOGICAL AND TECHNICAL FEASIBILITY OF RECOVERY

Successful recovery will only be accomplished with the support of the Walpole Island community. The community must find a way to manage land use change, which is probably the biggest threat facing the ecosystems on Walpole Island. Land use planning provides effective protection against such threats. An ecosystem based land use plan is consistent with First Nations traditions and values and is environmentally and economically sound. Such plans are being increasingly adopted across southern Ontario. In spite of this, the Capital Planning Study for Walpole Island (First Nations Engineering Services, 2000) did not take this approach, nor was it budgeted for in the update (2004). Most building and development on Walpole Island is *ad hoc* in nature. Ecosystems and populations of species at risk

are likely to be degraded by such lack of planning. The cumulative effects of small losses and individual decisions cannot be supported without major loss of habitats and species. Environmental Impact Studies and Environmental Assessments are almost unknown on Walpole Island, but may be necessary to determine which areas need to be protected. Implementation and enforcement of a land use plan must involve the whole community from individuals to the Chief and Band Council and the heads of all the Administrative Departments. Furthermore, information and education must continue to ensure that the community is informed about Species at Risk, the ecosystems they inhabit and threats that face them. Individual projects currently underway under the leadership of the Walpole Island Heritage Centre make small progress, but a holistic approach is needed to achieve long-term success.

Ecologically and technically, prairies and marshes are some of the easiest ecosystems to restore, except where they are invaded by non-native species, mainly because the herbaceous species that dominate them are quick to grow and respond. Forest restoration takes much longer because of the slow growth and long life span of trees. Walpole Island has relatively intact ecosystems that are on hand to provide seed sources and adjacent habitat. These constitute a major ecological resource and create an important advantage for restoration. Restoration of any ecosystem will not have to take place in isolation, and is therefore more likely to be successful. Traditional land management has maintained many of the ecosystems to the present day. Implementation of traditional practices, such as burning, wild plant harvest and hunting will help conserve these ecosystems. Restoration over the whole of WIFN is neither feasible nor practical, because large areas of marsh have been drained and converted to agriculture, dykes and ditches have drained many of the islands and buildings and infrastructure are in place. There are, however, large areas of the islands and the wetlands where recovery is certainly possible and desirable.

II RECOVERY

5. RECOVERY GOAL

To conserve and recover the ecosystems of the Walpole Island Territory in a way that is compliant with the Walpole Island First Nation Environmental Philosophy Statement provides opportunities for cultural and economic development, and provides protection and recovery for Canada's species at risk.

6. RECOVERY OBJECTIVES

1. To promote the traditional practices and values of Walpole Island First Nation and provide community input throughout the development and implementation of the Recovery Strategy and subsequent recovery and action plans.
2. To develop and use First Nations instruments for the long term maintenance and protection of the ecosystems and the species in them through
 - a) Developing and implementing strategic plans and administrative department plans that protect and conserve ecosystems and wildlife populations;
 - b) Assembling and analyzing traditional knowledge regarding the preservation, conservation and management of wildlife populations and ecosystems; and
 - c) Establishing a network of conservation areas through purchases, leases, conservation easements, donations and land swaps.
3. To minimize habitat loss and promote stewardship by educating, encouraging involvement and building capacity at Walpole Island by
 - a) Facilitating communication, coordination and information sharing among members of WIFN and among administrative departments regarding the conservation of ecosystems and wildlife populations;
 - b) Developing educational material and programs about Species at Risk and the ecosystems they inhabit;
 - c) Increasing the involvement of the community and landholders to make recovery community driven;
 - d) Creating economic opportunities and providing training within the community for environmental planning, habitat management, recovery, fundraising and communications;
 - e) Communicating the history of traditional respect of natural environments; and
 - f) Promoting traditional practices and values with children so that they grow up with these values and apply them in adulthood.
4. To use science balanced with aboriginal traditional knowledge to enhance the understanding of key aspects of ecosystems of Walpole Island through
 - a) Establishing programs to identify, inventory and monitor ecosystems, critical habitat and wildlife populations;
 - b) Censusing and monitoring populations of Species at Risk to provide baselines for measuring success;
 - c) Identifying, reducing and mitigating threats to the lands and waters of WIFN, and the ecosystems and wildlife they support;
 - d) Promoting and participating in research on ecosystems and habitat stewardship; and
 - e) Promoting and participating in management and restoration of natural habitats that have been damaged.
5. To develop relationships with potential partners that have a similar commitment to species protection, stewardship, recovery and restoration by
 - a) Evaluating recovery efforts within the whole of the Bkejwanong Territory and participating when appropriate; and

- b) Facilitating communications, coordination and information exchange with people and agencies outside WIFN regarding the conservation and recovery of ecosystems and wildlife populations.
6. To identify and implement options to compensate for the loss of land set aside for protection and ensure appropriate social economic analysis is undertaken for any recovery action.

7. STRATEGIES AND APPROACHES TO MEETING RECOVERY OBJECTIVES:

The overall strategies and approaches to recovery have been organized according to the overall recovery objective they are intended to address. These categories are not mutually exclusive and some proposed actions target more than one objective. Successful implementation of some objectives will require the formation of Recovery Action Groups and/or the preparation of specific Recovery Action Plans. Community involvement throughout the process (Objective 1) is the essential key to successful recovery.

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Priority	Objective Number	Broad Approach	Specific Tasks	Anticipated Effects
Urgent	1	Community input	<ul style="list-style-type: none"> • Community surveys • Questionnaires • Focus groups 	<ul style="list-style-type: none"> • Community increasingly informed about Habitat Stewardship and Species at Risk • Obtain input from members of the community
Urgent	1 3b 3c	Community input, education and involvement	<ul style="list-style-type: none"> • Find ways to improve marketing and communication to help the community identify with SAR and conservation • Find volunteers from the community to be on Action Teams • Radio programs • Newsletters • Calendars, posters • Community events • Displays and information at community gatherings • Identify and form community groups to be involved in recovery tasks. • Explore ways to provide resources to the community for recovery actions 	<ul style="list-style-type: none"> • Bring everyone in the community on board • Make recovery a community action. • Inform community about Habitat Stewardship and SAR. • Obtain input and feed back from community on recovery efforts • Community members and landholders benefit financially from stewardship initiatives.
Urgent	1 2c 3e 3f	Assemble Traditional Knowledge, promote traditional practices	<ul style="list-style-type: none"> • Assemble ATK • Hire an archivist • Explore ways in which ATK and beliefs can be promoted and distributed among the young 	<ul style="list-style-type: none"> • ATK archive of film, tapes and written documents • Protection of traditional language, culture and beliefs • Increased awareness of ATK and beliefs
Urgent	2a	Restoration of habitat Community involvement	<ul style="list-style-type: none"> • Clean up the garbage dump • Restoration of Pottawatomi dredge cut. 	<ul style="list-style-type: none"> • Protection for SAR and habitat adjacent to dump site • Reduced ground water pollution

Priority	Objective Number	Broad Approach	Specific Tasks	Anticipated Effects
				<ul style="list-style-type: none"> • Response to community requests • Improved habitat • Opportunities for recreation and eco-tourism • Community involvement
Urgent	2a	Conserve habitat	<ul style="list-style-type: none"> • Create a Land Trust model for WIFN or a First Nations Land Trust 	<ul style="list-style-type: none"> • Protection of leased and acquired land for perpetuity • Create confidence with donors and supporters of land protection.
Urgent	2a 3a 4c	Implementing plans and policies	<ul style="list-style-type: none"> • Develop infrastructure to implement plans and policies 	<ul style="list-style-type: none"> • Implementation of plans and policies • Interdepartmental cooperation
Urgent	2a 4c 4d	Develop plans and policies	<ul style="list-style-type: none"> • Introduce Environmental Impact Assessments for all new development on natural areas 	<ul style="list-style-type: none"> • Optimization of the use of developable land at WIFN • Protection of significant areas through land use planning.
Urgent	2a 4e	Controlled burns	<ul style="list-style-type: none"> • Develop management plan for controlled burns in co-operation with Lands and Fire departments and landholders 	<ul style="list-style-type: none"> • Controlled burns are used as a management tool for prairie and savannah habitats • Develops cooperation and awareness among departments • Understand the cultural connections with burns
Urgent	2b	Develop plans and policies	<ul style="list-style-type: none"> • Develop Mowing Policy 	<ul style="list-style-type: none"> • Protect SAR in public areas prone to mowing. • Encourage re-naturalization of private backyards.
Urgent	2c	Create conservation areas	<ul style="list-style-type: none"> • Purchase agricultural and unused land for land swaps 	<ul style="list-style-type: none"> • Protection of critical habitat threatened by development
Urgent	2c	Create conservation areas	<ul style="list-style-type: none"> • Purchase or lease critical habitat as it becomes available. 	<ul style="list-style-type: none"> • Secure prime natural areas
Urgent	3b	Education and capacity building	<ul style="list-style-type: none"> • Develop school curricula that include traditional knowledge and species at risk • Study the feasibility of developing a university-accredited environmental guardians training program. 	<ul style="list-style-type: none"> • Provide meaningful species at risk education at all levels of schooling • Provide on-island training in environmental monitoring and management.
Urgent	3b 3c 4e 5b	Education and community involvement	<ul style="list-style-type: none"> • Trees for Tomorrow tree growing program 	<ul style="list-style-type: none"> • Provide SAR and culturally important trees of WIFN for planting and restoration projects • Educate teachers and school children • Partnerships with other organizations (Sherwood Fox Arboretum) • Secure seed stock of threatened species
Urgent	3c	Create conservation areas	<ul style="list-style-type: none"> • Create network of conservation areas 	<ul style="list-style-type: none"> • Protection of significant natural areas • Protection of core areas of critical habitat plus linkages and

Priority	Objective Number	Broad Approach	Specific Tasks	Anticipated Effects
				connections <ul style="list-style-type: none"> • Larger protected areas will be more secure.
Urgent	3d 5b	Economic opportunities and capacity building	<ul style="list-style-type: none"> • Promote the development of a commercial seed outlet and nursery of native species 	<ul style="list-style-type: none"> • Provide material for restoration projects at WIFN and in SW Ontario • Provide income and revenue • Promote restoration in traditional territories • Generate funds for recovery
Urgent	4a	Identification of critical habitat	<ul style="list-style-type: none"> • ELC inventory and mapping of Forest and Wetland Habitats • Identification of senescent savannah habitats for rehabilitation 	<ul style="list-style-type: none"> • Provide inventory information comparable to that for prairies. • Determine the type and extent of provincially rare (S1-S3) vegetation types • Map locations of rare communities and rare species
Urgent	4b	Species census	<ul style="list-style-type: none"> • Census and mapping of populations of SAR 	<ul style="list-style-type: none"> • Provide information about species status at WIFN. • Provide baseline data for future monitoring. • Provide information for critical habitat mapping.
Urgent	4c	Reduce Threats	<ul style="list-style-type: none"> • Identify specific threats and their causes • Assess the significance of threats to species and habitats • Identify actions to reduce or mitigate threats • Identify and engage partners to reduce threats 	<ul style="list-style-type: none"> • Targets set to reduce specific threats • Partners engaged to assist in recovery actions • Reduce threats to species at risk and their ecosystems • Address specific action items of this strategy.
Urgent	4e	Invasive species management	<ul style="list-style-type: none"> • Develop plans and partnerships with various sectors of the community and agencies. 	<ul style="list-style-type: none"> • Reduce threats from invasive species • Increase community awareness and involvement • Increase cooperation between departments
Urgent	5a	Develop partnerships	<ul style="list-style-type: none"> • Identify and engage potential interest groups in Walpole Island 	<ul style="list-style-type: none"> • Strengthen community knowledge base and commitment to the recovery effort.
Urgent	5b	Develop partnerships	<ul style="list-style-type: none"> • Develop and strengthen existing partnerships • Identify and contact new potential partners 	<ul style="list-style-type: none"> • Input of ideas and expertise • Broaden potential sources of funding for recovery projects
Urgent	6	Compensation	<ul style="list-style-type: none"> • Development mechanisms to compensate for secured land • Acquire land for residential development for land swaps 	<ul style="list-style-type: none"> • Increased participation in habitat protection by the community • Community is rewarded for good land stewardship • Incentive to protect more critical habitat • Avoid financial loss and hardship for land set aside for conservation • Reduce threats to critical habitat

Priority	Objective Number	Broad Approach	Specific Tasks	Anticipated Effects
Necessary	1 3c	Community input, education and involvement	<ul style="list-style-type: none"> • Celebrations • Gatherings 	<ul style="list-style-type: none"> • Inform community about Habitat Stewardship and SAR. • Obtain input from members of the community. • Encourage community involvement
Necessary	1 2b 3f 4c 4e	Education and community involvement,	<ul style="list-style-type: none"> • Integrate traditional uses of species with best management 	<ul style="list-style-type: none"> • Protect resources such as sweetgrass, medicinal plants, wildlife and Black Ash • Protect species and habitat from damaging harvest practices
Necessary	2b	Controlled burns	<ul style="list-style-type: none"> • Communicate the danger of uncontrolled burns and request help with controlled burns • Emphasize controlled burns • Translate SAR booklet into Ojibway 	<ul style="list-style-type: none"> • Involves community in education and activities
Necessary	3b	Education		<ul style="list-style-type: none"> • Create teaching tool for Walpole Island School • Use SAR to teach Ojibway language
Necessary	3b 4a	Education and capacity building	<ul style="list-style-type: none"> • Implement and expand GREEN Project 	<ul style="list-style-type: none"> • Development of a "made for Walpole Island" school curriculum. • Continued water quality monitoring combined with education.
Necessary	3e 3f 2b 4a	Community input, education and involvement	<ul style="list-style-type: none"> • Identify unlisted species of concern on Walpole Island 	<ul style="list-style-type: none"> • Involve the community in species and habitat protection • Focus recovery efforts
Necessary	4a	Identification of critical habitat	<ul style="list-style-type: none"> • GIS mapping of rare species "hot spots" 	<ul style="list-style-type: none"> • Identification of important unprotected areas to target for protection • Confirm and support ranking of "significant sites"
Necessary	4a	Inventory and identification of critical habitat	<ul style="list-style-type: none"> • GIS mapping of SAR populations 	<ul style="list-style-type: none"> • Document specific information about location and status.
Necessary	4a	Inventory and identification of critical habitat	<ul style="list-style-type: none"> • GIS mapping of habitat change 	<ul style="list-style-type: none"> • Identification of primary restoration areas
Necessary	4a	Inventory and identification of critical habitat and species populations	<ul style="list-style-type: none"> • Inventory of target ecosystems • Inventory of SAR habitats • Inventory of insects 	<ul style="list-style-type: none"> • Provide information on critical habitats. • Provide baseline data for future monitoring. • Increase knowledge bases of biodiversity
Necessary	4e	Restoration of habitat	<ul style="list-style-type: none"> • Identify areas to target for restoration • Identify savannahs as potential sites for immediate restoration. 	<ul style="list-style-type: none"> • Focus restoration efforts in the most appropriate areas
Necessary	4e	Restoration of habitat	<ul style="list-style-type: none"> • Plan and implement restoration projects at Walpole Island 	<ul style="list-style-type: none"> • Restore habitat of species at risk
Necessary	4e,	Research	<ul style="list-style-type: none"> • Partnerships with universities 	<ul style="list-style-type: none"> • Increased knowledge of

Priority	Objective Number	Broad Approach	Specific Tasks	Anticipated Effects
	5b		and other research organizations • Participate in research programs on ecosystems and species at risk	ecosystems and species at risk • Develop partnerships • Increase and preserve ATK

Progress of recovery and evaluation of the recovery actions will be measured through the number of specific tasks accomplished or underway. Many activities are already being carried out. Community involvement can be measured through attendance at community events and activities, the number of active participants on Action Teams and feedback on comment sheets and questionnaires. Targets for individual species recovery will be set on a species by species basis.

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8. Knowledge Gaps

This section identifies important knowledge gaps for Walpole Island. Filling these knowledge gaps is included in the overall strategies and approaches, but they are discussed in more detail here.

Habitat and species inventories – Intensive inventory and mapping of habitat types within each of the five ecosystems, and delineation of species at risk populations is an essential step towards identification of critical habitat.

The prairie and savannah ecosystems (Woodliffe and Allen, 1998) have been quite well inventoried for the plant species they support, but these inventories are now 20 years old. Aquatic fauna of the wetlands and open waters are reasonably well documented (Walpole Island Heritage Centre, 20002; Myler, 1997; Edsall and Gannon, 1991; Metsger and Holm, 2000, Metsger et al., 2002). Other ecosystems on Walpole Island have had little in the way of thorough and formal inventory or documentation. Some species groups, for example insects, have had preliminary inventories done, but require additional work. Prairies support a rich invertebrate fauna. New discoveries are being made every year at other prairie sites in Ontario (Skevington, pers comm.), but Walpole Island has had little inventory of this kind. There are likely several to many new and rare species to be discovered.

An Ecological Land Classification (Lee et al, 1998) survey of the forests and marshes would provide valuable data for management purposes such as mapping of the communities they contain, allow assessment of their quality, rarity and extent and undoubtedly reveal additional species and locations. Inventory of the forest would also provide information on rates of expansion of forest into prairies and

savannahs. The prairie and savannah inventories need to be updated because of the dynamic nature of both ecosystems with respect to fire and encroachment by woody vegetation.

Aboriginal Traditional Knowledge - The extensive ecological and cultural knowledge of the First Nations about the ecosystems of Walpole Island has, by tradition, been passed down orally, and is not shared with outsiders (Jacobs, 2003). Loss of traditional culture and language has been identified as a major concern. Documentation of some of these values and traditions would safeguard against loss through a weakening of the oral traditions.

Invasive species – A number of non-native species of plants and animals are established on the land and in the waters of Walpole Island First Nation. Some are deliberately introduced, for example non-native fish species are released for sports fishing. The impacts of these species are, in some cases, considerable. The extent of non-native species establishment and their effects on native species and habitats is not well known.

Impacts of Pollution and Climate Change - The potential and real impacts of air and water and biological pollution on the ecosystems of Walpole Island has not been well documented. Pollution levels for substances like mercury are monitored in the St. Clair River and Lake St. Clair as these directly affect human health. Some other relationships are suspected, but have been less well studied, such as the increase in *Phragmites* as a result of fallout of atmospheric nitrogen compounds. Pesticide use on Walpole Island is being documented, but data on pollution levels and the effects on natural systems is very limited. Thermal pollution in the St. Clair River has contributed to an increased temperature in the river that may affect fish spawning.

In 2003 the Walpole Island Heritage Centre initiated a project to evaluate the effects of climate change on Walpole Island. A study is underway to investigate the extent and impact of the use of farm chemicals.

9. LINKS TO EXISTING RECOVERY AND MANAGEMENT PLANS

A number of management plans and recovery strategies are relevant to the Walpole Island Recovery Strategy. The Walpole Island Ecosystem Recovery Team shares members and species with other recovery teams. The federal partners in species at risk recovery are Environment Canada and, for aquatic species, the Department of Fisheries and Oceans, working through Environment Canada. The Tallgrass Prairie and Carolinian Woodland recovery strategies will use a similar format of a broad strategy with single species addenda, and will share common addenda. Some other First Nation communities share species at risk with Walpole Island and common approaches to recovery will be explored.. Other First Nations in Canada and the U.S. have ecosystem management and community planning projects that may serve as models for Walpole Island ecosystem recovery. Agencies and non-government

organizations such as Ducks Unlimited and the Nature Conservancy of Canada have similar goals of conserving ecosystems through proper management and wise use may become important partners. The relevant recovery strategies for individual species are lists in Appendix II to IV.

10. CULTURAL IMPORTANCE

A tradition of respect for the natural world, and Native philosophies and practices of interacting with nature are fundamental to the identity of First Nations and considered sacred obligations. These values, coupled with traditional land management have had a direct contribution to the present existence of the natural areas on Walpole Island and the astonishing richness of species they support. Hunting, fishing and harvesting plant and animal wildlife are not only part of this tradition, but provide an important source of income and livelihood to the community.

11. CONFLICTS AND CHALLENGES

Walpole Island has one of the highest densities of nationally rare species of any area in Canada. There are many challenges and potential conflicts facing the continued existence of these species and their habitats.

The Species at Risk Act targets those species and habitats that have been most impacted under the wave of land clearing, agriculture and development that followed European settlement. Rather than acknowledge and reward landholders and communities who have maintained and protected these species and habitats, SARA appears to unfairly target the economic progress and development of areas such as Walpole Island where land clearing and urbanization have been more limited. It is important that WIFN find community driven, First Nations solutions to protecting species and habitats. If WIFN can provide effective protection for species at risk, general or critical habitat prohibitions of SARA will never need to be enforced on Walpole Island.

Protection of species at risk and the ecosystems that support them must come from the Walpole Island community and employ First Nations instruments. Cultural, spiritual and economic benefits from protecting them must be tangible. The costs for not protecting them must be clearly demonstrated. Compensation and incentives will be necessary to secure land for protection.

Changes in Values and Land Use

Ironically it is First Nations traditions, culture and land use practices that have allowed many of the species at risk to survive on Walpole Island when they have been decimated or extirpated from the mainland. Many of these traditions and practices have been eroded.

Land use change associated with the growing population probably presents the most important challenge facing species at risk recovery and habitat conservation. Traditionally, all members of the community shared the land and waters and the resources they provided. Indian and Northern Affairs instituted a system of land holdings on First Nations through Certificates of Possession. This system of land tenure, combined with no current land use or development policies, has changed the Walpole Island community's communal value system and has allowed agricultural and residential development to occur on a haphazard basis depending on the preferences and requirements of individual landholders.

Globalization and materialization of the culture through modern media combined with traditions and language lost at residential schools have further conspired to erode the cultural and spiritual connections with the land. Some traditions, of which language is probably the most symbolic and important, have been all but lost on Walpole Island. Re-establishing traditional values among the Walpole Island community will be a major step in recovery planning.

Exploitation of Resources

While many traditions are maintained and handed down by Elders to succeeding generations, others have changed. For example, traditional methods of harvest have, in many cases, been supplanted by reliance on modern conveniences that include chain saws, motor boats, ATVs and rifles. With an ever-expanding population base, increased levels of harvest may not be sustainable.

Individual rights to hunt, fish and harvest are an important part of First Nations identity, and often an important source of income to people who practice them, but without the feedback mechanisms that are part of the tradition of community involvement, over exploitation of the resources is possible.

The increasing population on Walpole Island is also putting increasing pressure on resources that are traditionally harvested for income and livelihood. Lack of employment opportunities is widespread among the community, making harvest of natural resources not only culturally important, but also economically necessary. Community involvement in managing these traditional resources is essential to make sure that they are not over exploited or harmed.

Agriculture

Agriculture is economically very important on Walpole Island, and probably always has been, but today traditional agricultural practices are not economically viable and few traditional crops are grown. Virtually all the agriculture is carried out with commercial crops under modern farming regimes.

Lack of Awareness

The Walpole Island Community is justifiably proud of the rich natural heritage, but community surveys have indicated that many community members are unaware of just how important this natural heritage is

to other Canadians. In community surveys, many respondents listed the forests, wetland and shoreline as important to the natural heritage, but not a single person listed prairies by name. The prairie grasslands and the species they contain that are so rich and so rare in Ontario, are collectively known as “weeds” by the Walpole Island community.

Communications and Education

It is important that communications materials relating to species at risk and their habitats contain terms that the Walpole Island community uses regularly and can identify with; otherwise, the message may be misunderstood or not read entirely. For example, many Walpole Island community members refer to “freshwater mussels” as “clams” and have done so for generations, but communications that seek input about mussels are not picked up on because the community does not know what they are. It is also important that native language terms are used in describing species at risk and their habitats. This will help meet the goals of the Recovery Strategy by reestablishing traditional connections. Native terms have a more intimate meaning to the people of Walpole Island First Nation. For example, “prairies” in the native language is “Mshkode” meaning, “where the fire was”, which refers to a historical relationship and management of the ecosystem.

Education from K – 12 of species at risk, ecosystems, and the biology of Walpole Island is an important step in ensuring future generations conserve and protect the biological features of Walpole Island. Teaching native traditional teachings, philosophies, and values combined with good grounding in biology will re-enforce the importance of conserving and protecting Walpole Island’s natural heritage and must be built into the school curriculum.

Outside forces

Many of the threats to all five ecosystems and the species that they contain have origins outside Walpole Island and are beyond the control of the community. Contamination by airborne and waterborne materials and invasive species are probably the most important of these. Falling lake levels may also cause changes to wetland and shoreline habitats. Climate change is likely to affect all five ecosystems.

12. RECOMMENDED SCALE FOR RECOVERY

The first step to recovery is to conserve the existing critical habitat for species at risk on Walpole Island. This involves maintaining existing levels of habitat and populations to maintain the status quo. In the case of prairie and savannah ecosystems this will involve conservation of species at risk habitats through securing land and maintenance of occasional controlled burns. Further conservation of some habitat can also be achieved through removing immediate threats. Some relatively simple solutions are available such as a reduction of unnecessary mowing, implementing existing forest management policies and controlling vehicular access to natural areas.

Recovery will begin with rehabilitation of degraded natural habitats. This may include recovery of wetland habitats where diversity is declining as a result of water control structures such as dykes and ditches, and restoration of prairies and savannahs that have grown in to forest. Research and knowledge of this stage of recovery can be extended both from and to other areas that are being recovered.

Reclamation of habitats that have been lost to land use change is the next level of recovery. Most of the reclaimable land has been converted to agriculture. Reclamation of all the former natural habitats on Walpole Island is neither feasible nor desirable. Compensation for land that is set aside for recovery and reclamation will ensure that neither individuals nor the Walpole Island community bear the burden of the cost of such recovery efforts.

Downlisting of species at risk is the ultimate goal of all recovery, but this will require recovery actions well beyond the undisputed boundaries of Walpole Island First Nation. Successful recovery of species at risk recovery on Walpole Island alone will not result in a change in the national status of species. The area of Walpole Island, and thus the areas of occupancy, is too small to secure species that only occur on Walpole Island. Several of the species involved are already not at all rare on Walpole Island itself. Recovery efforts on Walpole can however provide the seed, both literally and figuratively for recovery over the whole of the Bkejwanong Territory. Walpole Island First Nation can take the lead in such recovery efforts.

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- Zhang, J.J., D.E. Stephenson and J.C. Semple (1999b) COSEWIC Status Report on the WILLOW ASTER, *Aster praealtus*. Committee on the Status of Endangered Wildlife in Canada. 20 pp.
- Zhang, J.J., J.C. Semple, M.J. Oldham and E. Punter (2000) COSEWIC Status Report on Riddell's Goldenrod (*Solidago riddellii*). Committee on the Status of Endangered Wildlife in Canada. 26 pp.

APPENDIX I: Actions Already Completed or Underway

The following recovery actions are currently underway or have been completed. Numbered headings refer to objective numbers.

1. *Community Input*

- Several focus group meetings have been held to provide community input into review and development of the Recovery Strategy.
- Copies of the Draft Recovery Strategy and Questionnaires were mailed to every household.
- Community meetings were held to provide feedback to the recovery process, over 300 comment sheets were returned.
- Community surveys have been conducted about the recovery strategy and species at risk.
- Publication of Nin.Da.Waab.Jig News promotes community environmental awareness.

2. *Developing First Nations instruments*

- Forest Management Policy developed (Walpole Island Forestry Program, 2000)
- Fishing Strategy completed (Walpole Island Heritage Centre, 2002)
- Environmental Management System Report (Kewayosh, 1999).
- Draft Environmental Management framework (Walpole Island Heritage Centre and Chreod Ltd., 1997)
- Draft Environmental Management System Policy Handbook (Kewayosk, 2001)
- Ecosystem planning principles and protection for species at risk habitat were incorporated into the updated Capital Planning Report (2005).

3. *Promoting stewardship and capacity building*

- Establishment of a Habitat Stewardship Program with full-time employees.
- Current outreach programs include newsletters, radio programmes, displays.
- Species-at-risk booklet has been published (Heritage Centre, 2002)
- Species-at-Risk booklet is being translated into Ojibway for school use.
- Landholder contact is used to gain access to significant sites
- Almost 18 ha of land have been secured through purchase.
- Over 16 ha of land have been secured through conservation leases.
- Draft Wetlands Management Plan. This plan was completed in 1991, but not adopted by WIFN.
- Yearly calendars have been produced.
- Earth Week Fair is held at the Walpole Island Elementary School to promote conservation and stewardship.
- Discussions with Indian and Northern Affairs Canada to develop an Environmental Training Centre on Walpole Island.
- Establishment of the Walpole Island Ecosystem Recovery Team

4. *Scientific research and monitoring*

- A Natural Heritage Inventory was initiated in 1985 and prioritized 638 ha in 30 significant natural areas to provide a basis for future conservation strategies (Woodliffe and Allen, 1987)
- Monitoring of air, water and soil. Monitoring is mostly informal and takes place through community initiatives.
- Census and mapping of populations of species listed as Threatened or Endangered.
- Inventory and ranking of natural areas recognized as Significant Sites (Woodliffe, 2002).
- Establishment of a database to store species and habitat information –Habitat Stewardship project in 2003.
- Invasive species control projects initiated – work crews employed.
- Freshwater mussel research and monitoring conducted.
- GIS mapping and database developed.

Partners and information exchange

- Conservation and Recovery Agreement with Environment Canada. Funding received for Habitat Stewardship Program – projects (Year 1 to Year 5)
- Partnership with National Waters Research Institute in the Freshwater Native Mussels Study of Lake St. Clair delta
- Prairie exhibit featuring Walpole Island at the Royal Ontario Museum.
- Partnership with Royal Ontario Museum in the Aquatic Communities Project.
- Partnerships with University of Michigan, data exchange for students and research projects.
- Partnerships with University of Western Ontario through Sherwood Fox Arboretum for Trees for Tomorrow.
- Partnership with University of Western Ontario, data exchange for student class and research projects.
- WIFN website provides information on Natural Heritage Program and Species
- Lake St. Clair Comprehensive Management Plan – Great Lakes Commission and US Army Corp of Engineers.
- Lake St. Clair Coastal Habitat Characterization Project – Great Lakes Commission and US National Oceanic and Atmospheric Administration (NOAA)
- Integrated Coastal Management Tool - Great Lakes Commission and NOAA Coastal Services Center.
- Canadian Lake St. Clair Watershed Management Plan (December 2003).
- Coastal Habitat Conservation and Restoration Plan (December 2003)
- Partnerships with Great Lakes Commission – Michigan Natural Features Inventory in Lake St. Clair projects.
- Partnerships with OMNR, WWF and Lambton Wildlife Inc. for preparation of life science inventory.
- Carolinian Canada plaque to be erected on Walpole Island in April 2004.
- Discussions with University of Western Ontario, department of Geography about research partnerships.

Exploring options for compensation

- Discussions with Environment Canada

APPENDIX II: Prairie and Savannah Species

Species at Risk listed in Table I below are found mostly in Prairie and Savannah ecosystems on Walpole Island First Nation. Goals and objectives for these species are similar and will require similar management and recovery activities. Individual species recovery strategies are considered addenda to the Walpole Island Ecosystem Recovery Strategy. For most species the recovery strategy is centered or extends beyond the boundaries of the Bkejwanong Territory. The table lists and summarizes information about featured species included. The following abbreviations are used:

- COSEWIC:** Status according to the Committee on the Status of Endangered Wildlife in Canada -
END = Endangered; THR = Threatened; SC = Special Concern; EXT = Extirpated; REV = Under Review
- G-Rank:** Global Rank - G5 = Very Common; G4 = Common; G3 = Rare to uncommon; G2 = Very Rare; G1 = Extremely Rare
- S-Rank:** Provincial Ranking – S5 = Very Common; S4 = Common; S3 = Rare to uncommon; S2 = Very Rare; S1 = Critically imperiled.
- Range in Canada:** SW = Southwestern Ontario; ON = Ontario; MB = Manitoba; NB = New Brunswick; QC = Quebec; WIFN = Walpole Island.
- Priority:** Importance of Walpole Island to the recovery and protection of the species in Canada – 1 = Very High, 2 = Moderately High, 3 = Moderate, 4 = Moderately Low. Based on population size on Walpole Island and proportion of the Canadian population on Walpole Island.
- Recovery Strategy:** Existing or Draft Recovery Strategies or Recovery Plans that include or cover the species of concern WIFN = Walpole Island (this document); TP = Tallgrass Prairie (Rodger, 1998); LESS = Eastern Pricklypear Cactus -Lake Erie Sand Spit Savannahs (Dougan and Associates, In prep); EPWFO = Eastern Prairie White Fringed Orchid (in prep); HESP = Henslow's Sparrow, MIBP = Manitoulin-Bruce Peninsula Alvar, EFS/EHS = Eastern Foxsnake-Eastern Hog-nosed Snake.

Table of Species at Risk in Prairie and Savannah Habitats in Walpole Island First Nation.

SPECIES	SCIENTIFIC NAME	COSEWIC	Schedule 1 SARA	G-Rank	S-Rank	Range in Canada	% of Canadian Population at WIFN	Priority	Recovery Strategy Deadline	Recovery Strategy	Prairie	Savannah
Plants												
Gattinger's Agalinis	<i>Agalinis gattingeri</i>	END	■	G4	S1	ON	<5%	3	Jun-2006	WIFN, TPM IBP	X	
Small white lady's-slipper	<i>Cypripedium candidum</i>	END	■	G4	S1	ON & MB	c. 50%	2	Jun-2006	WIFN & TP	X	X
White Prairie Gentian	<i>Gentiana alba</i>	END	■	G4	S1	WIFN	100%	1	Jun-2006	WIFN & TP		X
Pink Milkwort	<i>Polygala incarnata</i>	END	■	G5	S1	SW ON	>95%	1	Jun-2006	WIFN & TP	X	X
Eastern Prairie White Fringed-orchid	<i>Platanthera leucophaea</i>	END	■	G2	S2	ON	<10%	3	Jan-2008	EPWFO	X	X
Showy Goldenrod	<i>Solidago speciosa</i>	END	■	G5	S1	WIFN	100%	1	Jun-2006	WIFN & TP		X
Skinner's Agalinis	<i>Agalinis skinneriana</i>	END	■	G3	S2	SW ON	c. 90%	1	Jun-2006	WIFN & TP	X	
Colicroot	<i>Aletris farinosa</i>	THR	■	G5	S2	SW ON	c. 10%	2	Jun-2007	WIFN & TP	X	X
Dense Blazingstar	<i>Liatis spicata</i>	THR	■	G5	S3	SW ON	c. 80%	2	Jun-2007	WIFN & TP	X	X
Common Hop-tree	<i>Ptelea trifoliata</i>	THR	■	G5	S3	SW ON	<1%	4	Jan-2009	LESS		X
Willowleaf Aster	<i>Symphotrichum</i>	THR	■	G5	S2	SW ON	c.10%	4	Jan-2009	WIFN & TP	X	X
Climbing Prairie Rose	<i>Rosa setigera</i>	SC	■	G5	S3	SW ON	c10%	4	Jan-2010	WIFN & TP	X	X
Riddell's Goldenrod	<i>Solidago riddellii</i>	SC	■	G5	S2S3	MB,ON	c. 10%	3	Jun-2008	WIFN & TP	X	X
Birds												
Greater Prairie Chicken	<i>Tympanuchus cupido</i>	EXT	■	G4	SX	SW ON	Historic	X	Done	Prairie Chicken		
Henslow's Sparrow	<i>Ammodramus henslowii</i>	END	■	G4	S1	SW ON	?	1	Jun-2006	HESP	X	
Northern Bobwhite	<i>Colinus virginianus</i>	END	■	G5	S1S2	WIFN	?	1	Jun-2008	Bobwhite	X	X
Reptiles												
Eastern Massasauga	<i>Sistrurus catenatus</i>	END	■	G4T3	S3	ON	Historic	X	Jan-2009	Massasauga	X	X
Eastern Fox Snake	<i>Elaphe vulpina gloydi</i>	THR	■	G5T3	S3	ON	<10%	2	Jun-2007	EFS/EHS	X	X
Butler's Garter Snake	<i>Thamnophis butleri</i>	THR	■	G5	S2S3	SW ON	<10%	2	Jun-2007	WIFN	X	X
Lepidoptera												
Monarch Butterfly	<i>Danaus plexippus</i>	SC	■	G4	S4	Widespread		4	Jun-2008		X	X

APPENDIX III: Carolinian Forest Species

Species at Risk listed in Table I below are found mostly in Forest ecosystems on Walpole Island First Nation.. Individual species recovery strategies are considered addenda to the Walpole Island Ecosystem Recovery Strategy. For most species the recovery strategy is centered or extends beyond the boundaries of the Bkejwanong Territory. The table lists and summarizes information about featured species included. The following abbreviations are used:

- COSEWIC:** Status according to the Committee on the Status of Endangered Wildlife in Canada -
 END = Endangered; THR = Threatened; SC = Special Concern; EXT = Extirpated; REV = Under Review
- G-Rank:** Global Rank - G5 = Very Common; G4 = Common; G3 = Rare to uncommon; G2 = Very Rare; G1 = Extremely Rare
- S-Rank:** Provincial Ranking – S5 = Very Common; S4 = Common; S3 = Rare to uncommon; S2 = Very Rare; S1 = Critically imperiled.
- Range in Canada:** SW = Southwestern Ontario; ON = Ontario; MB = Manitoba; NB = New Brunswick; QC = Quebec; WIFN = Walpole Island
- Priority:** Importance of Walpole Island to the recovery and protection of the species in Canada – 1 = Very High, 2 = Moderately High; 3 = Moderate; 4 = Moderately Low. Based on population size on Walpole Island and proportion of the Canadian population on Walpole Island.
- Recovery Plan:** Existing or Draft Recovery Strategies or Recovery Plans that include or cover the species of concern WIFN = Walpole Island (this document); ACFL – HOWA = Acadian Flycatcher – Hooded Warbler, CW = Carolinian Woodlands.

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Table of Species at Risk in Carolinian Forest Habitats in Walpole Island First Nation.

SPECIES	SCIENTIFIC NAME	COSEWIC	Schedule 1 SARA	G-Rank	S-Rank	Range in Canada	% of Canadian Population at WIFN	Priority	Recovery Strategy Deadline	Recovery Plan	Prairie	Savannah	Forest
Plants													
Butternut	<i>Juglans cinerea</i>	END	■	G3G4	S3S4	ON, QC, NB	<1%	4	July-2006	Butternut , CW			X
Kentucky Coffee Tree	<i>Gymnocladus dioicus</i>	THR	■	G5	S2	SW ON	c. 10%	3	Jun-2007	WIFN, CW		X	X
Goldenseal	<i>Hydrastis canadensis</i>	THR	■	G4	S2	SW ON	c. 30%	3	Jun-2007	WIFN, CW			X
Shumard's Oak	<i>Quercus shumardii</i>	SC		G5	S3	SW ON	<1%	3		WIFN, CW		X	X
Birds													
Acadian flycatcher	<i>Empidonax virescens</i>	END	■	G5	S2	SW ON	?	3	Jun-2006	ACFL – HOWA			X
Hooded Warbler	<i>Wilsonia citrina</i>	THR	■	G5	S3	SW ON	?	4	Jun-2007	ACFL – HOWA			X
Cerulean Warbler	<i>Dendroica cerulea</i>	SC	■	G5	S3	SW ON	?	3	Jan-2010				X
Eastern Yellow-breasted Chat	<i>Icteria virens virens</i>	SC	■	G5	S2S3	SW ON	?	3	Jun-2008				X
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	SC		G5	S3S4	SW ON	?	4				X	X
Louisiana Waterthrush	<i>Seiurus motacilla</i>	SC		G5	S3	SW ON	?	3					X
Mammals													
Southern Flying Squirrel	<i>Glaucomys volans</i>	SC		G5	S3	ON, QC, NS		4					X
Reptiles													
Eastern Fox Snake	<i>Elaphe vulpina gloydi</i>	THR	■	G5T3	S3	ON	<10%	2	Jun-2007	EFS/EHS	X	X	X
Butler's Garter Snake	<i>Thamnophis butleri</i>	THR	■	G5	S2S3	SW ON	<10%	2	Jun-2007	WIFN	X	X	X
Eastern Milksnake	<i>Lampropeltis triangulum</i>	SC	■	G5T5	S5	ON, SW QC	?	4	Jan-2008				X
Five-line Skink	<i>Eumeces fasciatus</i>	SC		G5	S3S4	ON	?1%	3				X	X
Fishes													
Lepidoptera													
Monarch Butterfly	<i>Danaus plexippus</i>	SC	■	G4	S4	Widespread		4	Jun-2008		X	X	X

APPENDIX IV: Wetland and Open Water Species

Species at Risk listed in Table I below are found mostly in Wetland and Open Water ecosystems on Walpole Island First Nation. Individual species recovery strategies are considered addenda to the Walpole Island Ecosystem Recovery Strategy. For most species the recovery strategy is centered or extends beyond the boundaries of the Bkejwanong Territory. The table lists and summarizes information about featured species included. The following abbreviations are used:

- COSEWIC:** Status according to the Committee on the Status of Endangered Wildlife in Canada -
 END = Endangered; THR = Threatened; SC = Special Concern; EXT = Extirpated; REV = Under Review
- G-Rank:** Global Rank - G5 = Very Common; G4 = Common; G3 = Rare to uncommon; G2 = Very Rare; G1 = Extremely Rare
- S-Rank:** Provincial Ranking – S5 = Very Common; S4 = Common; S3 = Rare to uncommon; S2 = Very Rare; S1 = Critically imperiled.
- Range in Canada:** SW = Southwestern Ontario; ON = Ontario; MB = Manitoba; NB = New Brunswick; QC = Quebec; WIFN = Walpole Island
- Priority:** Importance of Walpole Island to the recovery and protection of the species in Canada – 1 = Very High, 2 = Moderately High
 3 = Moderate; 4 = Moderately Low. Based on population size on Walpole Island and proportion of the Canadian population on Walpole Island.
- Recovery Plan:** Existing or Draft Recovery Strategies or Recovery Plans that include or cover the species of concern WIFN = Walpole Island (this document), TR = Thames River (in prep); SYD = Sydenham River (Dextrase et al, 2003); AR = Ausable River, SpSS = Spiny Softshell, OM = Ontario Mussels.

Table of Species at Risk in Wetland and Open Water Habitats in Walpole Island First Nation.

SPECIES	SCIENTIFIC NAME	COSEWIC	Schedule 1 SARA	G-Rank	S-Rank	Range In Canada	% of Canadian Population at WIFN	Priority	Recovery Strategy Deadline	Recovery Plan	Wetland	Open Waters
Plants												
Swamp Rose-mallow	<i>Hibiscus moscheutos</i>	SC		G5	S3	ON	>5%	3		WIFN	X	X
Birds												
King Rail	<i>Rallus elegans</i>	END	■	G4	S2	SW ON	?	1	Jun-2006	King Rail	X	X
Least Bittern	<i>Ixobrychus exilis</i>	THR	■	G5	S3	Widespread	?10%	3	Jun-2007	Least Bittern	X	
Reptiles												
Queen Snake	<i>Regina septemvittata</i>	THR	■	G5	S2	SWON	?	3	Jun-2007	Queen Snake, TR, AR	X	X
Spotted Turtle	<i>Clemmys guttata</i>	END	■	G5	S3	ON, QC	?	3	July-2008		X	
Eastern Spiny Softshell	<i>Apalone spinifera spinifera</i>	THR	■	G5T5	S3	SW ON, QC	?1%	4	Jan-2009	SpSS, TR, AR & SYD	X	X
Stinkpot	<i>Sternotherus odoratus</i>	THR	■	G5	S4	ON, QC	?	3	Jan-2007		X	X
Northern Map Turtle	<i>Graptemys geographica</i>	SC	■	G5	S4	ON, SW QC	?	4	Jan-2008		X	X
Fishes												
Pugnose Shiner	<i>Notropis anogenus</i>	END	■	G3	S2	ON	?	2	Jan-2006		X	X
Northern Madtom	<i>Noturus stigmosus</i>	END	■	G4	S?	SW ON	?	2	Jan-2006	SYD,TR	X	X
Lake Chubsucker	<i>Erimyzon sucetta</i>	THR	■	G5	S1S2	SW ON	?	3	2007?	AR, TR	X	X
Spotted Sucker	<i>Minytrema melanops</i>	SC	■	G5	S1S2	SW ON	?>50%	2	2008?	SYD, TR	X	X
Channel Darter	<i>Percina copelandi</i>	THR		G5	S2	ON, QC	?	3		Channel Darter	X	X
Molluscs												
Northern Riffleshell	<i>Epioblasma torulosa</i>	END	■			SW ON	<1%	3	2006?	SYD, OM, AR		X
Wavy-rayed Lampmussel	<i>Lampsilis fasciola</i>	END	■			SW ON	EXT	3	2006?	SYD, OM, AR,TR		X
Round Hickorynut	<i>Obovonia subrotunda</i>	END	■			SW ON	?90%	1	Jan-2006	?WIFN, OM,TR		X
Round Pigtoe	<i>Pleurobema sintoxia</i>	END	■			ON			July-2006			X
Kidneyshell	<i>Ptychobranchus fasciolaris</i>	END	■			SW ON	?50%	1	Jan-2006	?WIFN, OM, AR,TR		X
Rayed Bean	<i>Villosa fabalis</i>	END	■			SW ON	?0%	3	2006?	SYD, OM, AR		X

APPENDIX V: Checklists of rare flora and fauna of Walpole Island

The following lists are taken from checklists for flora and fauna of Walpole Island as follows:

Plants, Birds, Mammals, Reptiles and Insects (Woodliffe and Allen, 1998);
Fish (Walpole Island Heritage Centre, 2002); and
Molluscs (Metcalf-Smith, pers. comm. 2004).

Species on this list are ranked as rare in Ontario (S-Rank S1-S3) by the Natural Heritage Information Centre (see NHIC website at www.mnr.gov.on.ca/MNR/nhic). Species on this list are current of potential candidates for consideration by COSEWIC. Some may be more imperiled in Ontario than species already listed by COSEWIC. Recovery planning for Species at Risk on Walpole Island should also take these species into consideration.

COSEWIC: Status according to the Committee on the Status of Endangered Wildlife in Canada -
END = Endangered: THR = Threatened: SC = Special Concern; EXT = Extirpated;
REV = Under Review

S-Rank: Provincial Ranking – S5 = Very Common; S4 = Common; S3 = Rare to uncommon;
S2 = Very Rare; S1 = Critically imperiled.

EXP: Species probably extirpated from Walpole Island.

Scientific Name	Common Name	S-RANK	COSEWIC	EXP
PLANTS				
<i>Aesculus glabra</i>	OHIO BUCKEYE	S1		
<i>Agalinis gattingeri</i>	GATTINGER'S GERARDIA	S1	END	
<i>Agalinis purpurea</i>	PURPLE GERARDIA	S1?		
<i>Agalinis skinneriana</i>	SKINNER'S GERARDIA	S2	END	
<i>Agrimonia parviflora</i>	SWAMP AGRIMONY	S3S4		
<i>Aletris farinosa</i>	COLIC ROOT; STARGRASS	S2	THR	
<i>Asclepias purpurascens</i>	PURPLE MILKWEED	S2		
<i>Asclepias sullivantii</i>	SULLIVANT'S MILKWEED	S2		
<i>Aster dumosus</i>	BUSHY ASTER	S2S3		
<i>Aster praealtus</i>	WILLOW ASTER	S2		
<i>Aureolaria flava</i>	SMOOTH FALSE FOXGLOVE	S3		
<i>Aureolaria pedicularia</i>	ANNUAL FALSE FOXGLOVE	S3		
<i>Baptisia tinctoria</i>	WILD INDIGO	S2		
<i>Bartonia virginica</i>	SCREW-STEM	S2		
<i>Bidens coronata</i>	TALL SWAMP-MARIGOLD	S2		
<i>Bulbostylis capillaris</i>	SEDGE	S3S4		
<i>Carex amphibola</i>	SEDGE	S2		
<i>Carex bicknellii</i>	SEDGE	S2		
<i>Carex conoidea</i>	SEDGE	S3		
<i>Carex emoryi</i>	SEDGE	S3S4		
<i>Carex formosa</i>	SEDGE	S3S4		
<i>Carya glabra (C. ovalis)</i>	PIGNUT HICKORY	S3		
<i>Carex gracilescens</i>	SEDGE	S3		
<i>Carya laciniata</i>	SHELLBARK HICKORY	S3		
<i>Carex meadii</i>	SEDGE	S2		
<i>Carex muskingumensis</i>	SEDGE	S2		
<i>Carex suberecta</i>	SEDGE	S2		
<i>Carex swanii</i>	SEDGE	S3		
<i>Carex tetanica</i>	SEDGE	S3		
<i>Cerastium nutans</i>	NODDING CHICKWEED	S3?		

Scientific Name	Common Name	S-RANK	COSEWIC	EXP
<i>Cerastium velutinum</i>	CHICKWEED	S2		
<i>Coreopsis tripteris</i>	TALL COREOPSIS	S2		
<i>Cuscuta cephalanthi</i>	BUTTONBUSH DODDER	S2		
<i>Cuscuta coryli</i>	HAZEL DODDER	S1		
<i>Cypripedium candidum</i>	WHITE LADY'S-SLIPPER	S1	END	
<i>Cyperus erythrorhizos</i>	UMBRELLA SEDGE	S3		
<i>Cyperus flavescens</i>	SEDGE	S2		
<i>Cyperus schweinitzii</i>	UMBRELLA SEDGE	S3		
<i>Desmodium rotundifolium</i>	ROUND-LEAVED TICK-TREFOIL	S2S3		
<i>Eleocharis quadrangulatum</i>	FOUR-SIDED SKIKE RUSH	S1		
<i>Eragrostis capillaris</i>	LACE GRASS	S1		
<i>Eupatorium purpureum</i>	PURPLE JOE-PYE WEED	S3		
<i>Fimbristylis puberula</i>	CHESTNUT SEDGE	S1		
<i>Gentiana alba</i>	WHITE PRAIRIE GENTIAN	S1	END	
<i>Gentianella quinquefolia</i>	STIFF GENTIAN	S2		
<i>Gymnocladus dioicus</i>	KENTUCKY COFFEE TREE	S2	THR	
<i>Hibiscus moscheutos</i>	SWAMP ROSE MALLOW	S3	SC	
<i>Hydrastis canadensis</i>	GOLDENSEAL	S2	THR	
<i>Hypoxis hirsuta</i>	YELLOW STAR GRASS	S3		
<i>Juglans cinerea</i>	BUTTERNUT	S3S4	END	
<i>Juncus acuminatus</i>	SHARP-FRUITED RUSH	S3S4		
<i>Juncus greenei</i>	GREENE'S RUSH	S3		
<i>Koeleria macrantha</i>	JUNE GRASS	S2		
<i>Krigia biflora</i>	FALSE DANDELION	S2		
<i>Lechea pulchella</i>	LEGGETT'S PINWEED	S1		
<i>Lechea villosa</i>	HAIRY PINWEED	S3		
<i>Liatris aspera</i>	ROUGH BLAZINGSTAR	S2		
<i>Liatris spicata</i>	DENSE BLAZINGSTAR	S2S3	THR	
<i>Liriodendron tulipifera</i>	TULIP TREE	S3S4		
<i>Lupinus perennis</i>	WILD LUPINE	S3		
<i>Lycopus rubellus</i>	STALKED WATER HOREHOUND	S2		
<i>Lythrum alatum</i>	WINGED LOOSESTRIFE	S3		
<i>Nelumbo lutea</i>	AMERICAN LOTUS	S2		
<i>Nyssa sylvatica</i>	BLACK GUM	S3		
<i>Panicum clandestinum</i>	PANIC GRASS	S2		
<i>Panicum dichotomum</i>	PANIC GRASS	S2		
<i>Panicum leibergii</i>	LEIBERG'S PANIC GRASS	S2		
<i>Panicum meridionale</i>	MAT PANIC GRASS	S1		
<i>Panicum praecocius</i>	PANIC GRASS	S3		
<i>Panicum sphaerocarpon</i>	ROUND-FRUITED PANIC GRASS	S3		
<i>Platanthera flava</i>	TUBERCLED ORCHID	S3?		
<i>Platanthera leucophaea</i>	EASTERN PRAIRIE FRINGED ORCHID	S2	END	
<i>Polygala incarnata</i>	PINK MILKWORT	S1	END	
<i>Polygonum tenue</i>	SLENDER KNOTWEED	S2		
<i>Ptelea trifoliata</i>	COMMON HOP-TREE	S3	THR	
<i>Quercus palustris</i>	PIN OAK	S3		
<i>Quercus shumardii</i>	SHUMARD OAK	S3	SC	
<i>Ratibida pinnata</i>	YELLOW CONEFLOWER	S2S3		
<i>Rosa setigera</i>	CLIMBING PRAIRIE ROSE	S3	SC	
<i>Scirpus clintonii</i>	CLINTON'S BULRUSH	S2		
<i>Scleria triglomerata</i>	TALL NUT-RUSH	S1		

Scientific Name	Common Name	S-RANK	COSEWIC	EXP
<i>Scleria verticillata</i>	NUT-RUSH	S3		
<i>Silphium terebinthinaceum</i>	PRAIRIE DOCK	S1		
<i>Sisyrinchium albidum</i>	COMMON BLUE-EYED-GRASS	S1		
<i>Solidago riddellii</i>	RIDDELL'S GOLDENROD	S2S3	SC	
<i>Solidago rigida</i>	STIFF GOLDENROD	S3		
<i>Solidago speciosa</i>	SHOWY GOLDENROD	S1S2	END	
<i>Spiranthes lacera</i> var. <i>gracilis</i>	SOUTHERN SLENDER LADIES'-TRESSES	S1		
<i>Spiranthes magnicamporum</i>	PRAIRIE LADIES'-TRESSES	S3		
<i>Spiranthes ochroleuca</i>	YELLOW LADIES'-TRESSES	S2		
<i>Spiranthes ovalis</i>	OVAL LADIES'-TRESSES	S1		
<i>Symphyotrichum praelatum</i>	WILLOWLEAF ASTER	S2	THR	
<i>Thalictrum revolutum</i>	WAXY MEADOW-RUE	S2		
<i>Tradescantia ohioensis</i>	COMMON SPIDERWORT	S2		
<i>Veronicastrum virginicum</i>	CULVER'S ROOT	S2		
<i>Vicia caroliniana</i>	PALE or WOOD VETCH	S2		
<i>Vitis labrusca</i>	FOX GRAPE	S1S2		

MAMMALS

<i>Glaucomys volans</i>	Southern Flying Squirrel	S3	SC	
<i>Taxidea taxus</i>	American Badger	S2	END	*

BIRDS

<i>Ammodramus henslowii</i>	Henslow's Sparrow	S1	END	
<i>Aythya americana</i>	Redhead	S2		
<i>Aythya valisineria</i>	Canvasback	S1		
<i>Baeolophus bicolor</i>	Tufted Titmouse	S2S3		
<i>Bubulcus ibis</i>	Cattle Egret	S2S3		
<i>Casmerodius albus</i>	Great Egret	S2		
<i>Chlidonias niger</i>	Black Tern	S3	NAR	
<i>Colinus virginianus</i>	Northern Bobwhite	S1S2	END	
<i>Dendroica cerulea</i>	Cerulean Warbler	S3	SC	
<i>Empidonax vireescens</i>	Acadian Flycatcher	S2	END	
<i>Icterus virens</i>	Yellow-breasted Chat	S2S3	SC	
<i>Ixobrychus exilis</i>	Least Bittern	S3	THR	
<i>Larus minutus</i>	Little Gull	S1S2		
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S3	SC	
<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	S3		
<i>Oxyura jamaicensis</i>	Ruddy Duck	S2		
<i>Protonotariacitrea</i>	Prothonotary Warbler	S1S2	END	
<i>Rallus elegans</i>	King Rail	S2	END	
<i>Seiurus motacilla</i>	Louisiana Waterthrush	S3	SC	
<i>Sterna caspia</i>	Caspian Tern	S3	NAR	
<i>Tympanuchus cupido</i>	Greater Prairie-chicken	SX	EXP	*
<i>Vireo griseus</i>	White-eyed Vireo	S2		
<i>Wilsonia citrina</i>	Hooded Warbler	S3	THR	
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed Blackbird	S2S3		

REPTILES

<i>Apalone s.spinifera</i>	Eastern Spiny Soft-shelled Turtle	S3	THR	
<i>Chemmys guttata</i>	Spotted Turtle	S3	SC	
<i>Elaphe gloydi</i>	Eastern Fox Snake	S3	THR	

Scientific Name	Common Name	S-RANK	COSEWIC	EXP
<i>Emydoidea blandingii</i>	Blanding's Turtle	S3	SC	
<i>Eumeces fasciatus</i>	Common Five-lined Skink	S3	SC	
<i>Graptemys geographica</i>	Northern Map Turtle	S3	SC	
<i>Lampropeltis t. triangulatum</i>	Eastern Milksnake	S3	SC	
<i>Regina septemvittata</i>	Queen Snake	S2	THR	
<i>Sistrurus c. catenatus</i>	Eastern Massasauga	S3	THR	*
<i>Sternotherus odoratus</i>	Stinkpot	S3	THR	
<i>Thamnophis butleri</i>	Butler's Garter Snake	S2	THR	

FISH

<i>Acipenser fulvescens</i>	Lake Sturgeon	S3	NAR	
<i>Campostoma anomalum</i>	Central Stoneroller	S4	NAR	
<i>Erimyzon sucetta</i>	Lake Chubsucker	S2	THR	
<i>Etheostoma blennioides</i>	Greenside Darter	S4	SC	
<i>Fundulus notatus</i>	Blackstripe Topminnow	S2	SC	
<i>Ichthyomyzon unicuspis</i>	Silver Lamprey	S3		
<i>Minytrema melanops</i>	Spotted Sucker	S2	SC	
<i>Notropis anogenus</i>	Pugnose Shiner	S2	END	
<i>Notropis b Buchanan</i>	Ghost Shiner	S2	NAR	
<i>Noturus miurus</i>	Brindled Madtom	S2	NAR	
<i>Noturus stigmosus</i>	Northern Madtom	S1S2	END	
<i>Percina copelandi</i>	Channel Darter	S2	THR	

LEPIDOPTERA

<i>Boloria bellona</i>	Meadow Fritillary	S5		
<i>Chlosyne harrisii</i>	Harris' Checkerspot	S3S4		
<i>Danaus plexippus</i>	Monarch	S4	SC	
<i>Erynnis baptisiae</i>	Wild Indigo Duskywing	S1		
<i>Erynnis horatius</i>	Horace's Duskywing	SZB		
<i>Erynnis lucilius</i>	Columbine Duskywing	S3S4		
<i>Erynnis martialis</i>	Mottled Duskywing	S2		
<i>Erynnis persius persius</i>	Persius Duskywing	SH ??		
<i>Euphyes conspicua</i>	Black Dash	S3S4		
<i>Euphyes dukesi</i>	Duke's Skipper	S2		
<i>Papilio cresphontes</i>	Giant Swallowtail	S2S3		
<i>Poanes massasoit</i>	Mulberry Wing	S3		
<i>Thorybes bathyllus</i>	Southern Cloudywing	S3		

MOLLUSCS

<i>Actinonaias ligamentina</i>	Mucket	S3		*
<i>Alasmidonta marginata</i>	Elktoe	S3		
<i>Alasmidonta viridis</i>	Slippershell Mussel	S3		*
<i>Cyclonaias tuberculata</i>	Purple Wartyback	S3		*
<i>Epioblasma torulosa rangiana</i>	Northern Riffleshell	S1	END	
<i>Epioblasma triquetra</i>	Snuffbox	S1	END	*
<i>Fusconaia flava</i>	Wabash Pigtoe	S2S3		
<i>Lampsilis cardium</i>	Plain Pocketbook	S4		
<i>Lampsilis fasciola</i>	Wavyrayed Lampmussel	S1	END	
<i>Ligumia nasuta</i>	Eastern Pondmussel	S2S3		
<i>Ligumia recta</i>	Black Sandshell	S3		
<i>Obliquaria reflexa</i>	Threehorn Wartyback	S1		*

Scientific Name	Common Name	S-RANK	COSEWIC	EXP
<i>Obovaria olivaria</i>	Hickorynut	S1?	REV	*
<i>Obovaria subrotunda</i>	Round Hickorynut	S1	END	
<i>Pleurobema sintoxia</i>	Round Pigtoe	S2S3	END	
<i>Potamilus alatus</i>	Pink Heelsplitter	S3		
<i>Ptychobranchnus fasciolaris</i>	Kidneyshell	S1	END	
<i>Quadrula pustulosa</i>	Pimpleback	S3		
<i>Quadrula quadrula</i>	Mapleleaf	S3	REV	
<i>Simpsonaias ambigua</i>	Salamander Mussel	S1	END	*
<i>Strophitus undulatus</i>	Creeper	S5		
<i>Toxolasma parvus</i>	Lilliput	S1		*
<i>Truncilla donaciformis</i>	Fawnsfoot	S2		
<i>Truncilla truncata</i>	Deertoe	S3		*
<i>Utterbackia imbecillis</i>	Paper Pondshell	S2		*
<i>Villosa fabalis</i>	Rayed Bean	S1	END	*
<i>Villosa iris</i>	Rainbow	S2S3	REV	

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APPENDIX VI: References for Species at Risk listed in Appendix II to IV.

Plants	Reference
Butternut	
Climbing Prairie Rose	Ambrose (1984), Woodliffe (2002)
Colicroot	Kirk (1988), White and Oldham (2000a)
Common Hop-tree	Ambrose and Aboud (1984), Ambrose (2003)
Dense Blazingstar	Allen (1998), Allen (2001)
Eastern Prairie Fringed-orchid	Brownell (1984b), Brownell and Catling (2002), Dougan and Associates (2004)
Gattinger's Agalinis	Canne-Hilliker (1988a), Canne-Hilliker (1999b)
Goldenseal	Catling and Sinclair (1998), Sinclair and Catling (2000), White (1991)
Kentucky Coffee Tree	Ambrose (1983), White and Oldham (2000b)
Pink Milkwort	Brownell, (1994a), Brownell (1998), Brownell (2000)
Riddell's Goldenrod	Zhang et al. (2000)
Showy Goldenrod	Zhang et al. (1999a)
Shumard's Oak	Waldron (1984), White (1999)
Skinner's Agalinis	Canne-Hilliker (1988b), Canne-Hilliker (1999b)
Small white lady's-slipper	Brownell (1991), Punter (1999)
Swamp Rose-mallow	Ford (1987), Allen and Ford (2003)
White Prairie Gentian	Waldron (1991)
Willowleaf Aster	Zhang et al. (1999b)
Birds	
King Rail	James (2000d)
Henslow's Sparrow	Knapton, (1984), Austen et al (1997), Austen and Cadman (1993), James (2000b)
Acadian flycatcher	Page and Cadman (1994a), James (2000a)
Greater Prairie Chicken	Saskatchewan Department of Renewable Resources (1978), Minish (1990), Hiertas et al. (1993)
Least Bittern	Sandilands and Cambell (1988), James (1999)
Hooded Warbler	Page and Cadman (1994b), James (2000c)
Eastern Yellow-breasted Chat	Cadman and Page (1994)
Northern Bobwhite	Page (1994)
Red-headed Woodpecker	Page (1996)
Louisiana Waterthrush	Page (1996)
Cerulean Warbler	McCracken et al. (1993)
Mammals	
Southern Flying Squirrel	Stabb (1988)
Reptiles	
Stinkpot	
Queen Snake	Smith (1999)
Eastern Fox Snake	Wilson and Prior (1999)
Butler's Garter Snake	Sandilands (1999)
Eastern Massasauga	Weller and Parsons (1991)
Eastern Spiny Softshell	Campbell (1991), Oldham et al, (1997)
Spotted Turtle	Oldham (1991)
Northern Map Turtle	http://www.speciesatrisk.gc.ca/search/speciesDetails_e.cfm?SpeciesID=712
Five-line Skink	Seburn and Seburn (1998)
Eastern Milksnake	http://www.speciesatrisk.gc.ca/search/speciesDetails_e.cfm?SpeciesID=714

Fishes	
Spotted Sucker	Campbell (1994)
Lake Chubsucker	Mandrak and Crossman (1994)
Channel Darter	Goodchild (1993a)
Pugnose Shiner	Parker et al. (1985)
Northern Madtom	Goodchild (1993b), Holm and Mandrak (1997), Holm and Mandrak (1998), MacInnes (1998)
Lepidoptera	
Monarch Butterfly	Crolla and Lafontaine (1997)
Molluscs	
Northern Riffleshell	Staton et al. (2000), Zannata et al. (2002), McGoldrick et al. (2003)
Rayed Bean	West et al, (2000), Zannata et al. (2002), McGoldrick et al. (2003)
Wavy-rayed Lampmussel	Metcalf-Smith et al. (2000), Zannata et al. (2002), McGoldrick et al. (2003)
Kidneyshell	Zannata et al. (2002), McGoldrick et al. (2003)
Round Hickorynut	Zannata et al. (2002), McGoldrick et al. (2003)
Round Pigtoe	Zannata and Metcalf-Smith (2004)

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