

Greater Rondeau

Important Bird Area

Conservation Plan

Written for the Greater Rondeau IBA Stakeholders

by

Edward D. Cheskey and William G. Wilson

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A bird's eye view of the Rondeau peninsula, Rondeau Bay and Lake Erie, Rondeau Important Bird Area

Photograph by Austin Wright

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Organizations

Bird Studies Canada
Canadian Wildlife Service
Friends of Rondeau
Ontario Ministry of Natural Resources
Rondeau Bay Waterfowlers Association
Rondeau Bay Watershed Rehabilitation Project
Rondeau Provincial Park
Stewardship Kent

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1.0 Introduction

The conditions were perfect to show our colleagues from Europe the landscape of southwestern Ontario. We were flying southwest along an axis that followed the 401 Highway. The land below was a patchwork of cropped fields and back-forty woodlots intersected by grids of roads, the occasional watercourse and sprawling settlements. “Not much forest in Ontario,” they remarked.

“Bread-basket of the province,” I countered. Cropped fields became even more predominant southwest of sprawling London. We picked up the shoreline of Lake Erie, crossing the recently protected Clear Creek valley. This irregular, finger-like green projection points north in defiance of the surrounding landscape towards another fragmented wooded patch known as Skunk’s Misery. “We saved that piece,” I boasted.

The scene below was humbling, though. Almost no forest remained along the shore. I imagined how different the landscape would look if ever the green bits (they really do look small from the air) could ever be reconnected. Moments later we were nearing the Rondeau area. Black soils of vegetable farms below radiated heat, causing thermals that made the aircraft suddenly rise and our stomachs fall. The peninsula itself fanned out in its unique shape to the south and then west, protecting the rounded bay and marshlands. Now that patch of nature was impressive.


“*C’est quoi ça?*” asked Helene.


“Rondeau, *un parc provincial*,” I replied.

“*Ronde eau, bien nommée! Il y a du français là-bas?*” Not clear on the history or culture of the area, I avoided the question, and instead noted the great diversity of birds attracted by its expanse and verdant habitats. From our perspective it was not hard to see how this remarkable place was a bird Mecca. We could easily see across Lake Erie at this point and imagine birds migrating north across the lake fixing their bearings on the Rondeau peninsula. From Rondeau to Windsor, perhaps with the exception of Pelee, it looked as if we could have rolled up all of the remaining tiny green blobs together and they would not have added up to Rondeau in area.

“Can we visit Rondeau before leaving?” asked Nils. The plane suddenly shuddered.

“Looks like we might visit Rondeau sooner than we thought!” I said to my white-knuckled friends.¹

This ervation plan will also take you, the reader, into the Rondeau area, without danger, but with time to explore its geography, history, surroundings, and avian inhabitants and to consider what may be required to maintain the majesty of this natural area.

The Greater Rondeau IBA is centred on Rondeau Provincial Park, including the eight-kilometre peninsula, as well as Rondeau Bay. On the side near the lake the IBA extends two kilometres offshore include waters often used by congregating waterfowl in the fall, winter, and spring. Inland from Rondeau Bay the IBA includes a sweep of adjacent agricultural land, settlements, Great Lakes coastal marsh, and interior wetland.

The Greater Rondeau Area IBA is a globally significant IBA for both threatened and congregatory species. In 1999 50 percent of Canada’s Prothonotary Warblers bred in Rondeau Provincial Park and

¹ Fictitious story written by Edward Cheskey.

in 2000, 65 percent! Large expanses of marsh are home for nationally significant numbers of Forster's Terns and King Rail. Globally significant concentrations of waterfowl and shorebirds gather within the IBA during spring migration.

This conservation plan was developed over a series of meetings in Rondeau Provincial Park, the first of which was held in November 1999. An informal steering committee laid the groundwork. The main participants in this process have been Rondeau Provincial Park, the Ontario Ministry of Natural Resources, Bird Studies Canada, the Canadian Wildlife Service, The Friends of Rondeau, Rondeau Bay Waterfowlers Association, Rondeau Bay Watershed Rehabilitation Project, and Stewardship Kent. Plans reflect the vision and wishes of their creators, and, they are works in progress, open to revision and rethinking. We are hopeful that this plan captures the tremendous ecological value of Rondeau and presents the arguments, goals, and objectives of the steering committee in a way that will serve the community and the birds well. We also hope that it is periodically revisited, revised, and treated as a work in progress.

The layout for this conservation plan is as follows. Chapter 2 describes the IBA program, its goals, and criteria for site selection. Chapter 3 provides a geographical and biophysical context to the IBA. Chapter 4 delves into the lives of the birds, providing readers with an accurate and current summary of each IBA species' natural history, considering first threatened species, and then congregatory species. Chapter 5 describes the biologically significant features of the IBA beyond the IBA species. Chapters 6 to 8 discuss land ownership, human cultural activity, and the history of the site. Chapters 9 and 10 present opportunities and threats to IBA species. The action plan, a presentation of the steering committee's vision, goals, objectives, and strategies, is in Chapter 11.

The Vision Statement for the Greater Rondeau IBA is as follows:

The Greater Rondeau Important Bird Area will promote conservation and stewardship to protect its global and national significance for breeding, wintering, and migratory birds, as a place where birds can be monitored, studied and enjoyed for the ecological, educational, economic and recreational benefits of the people of Ontario and beyond.

2.0 The Important Bird Areas Program

The IBA program is an international initiative coordinated by BirdLife International, a partnership of member-based organizations in over 100 countries seeking to identify and conserve sites important to all bird species world-wide. Through the protection of birds and habitats, they also promote the conservation of the world's biodiversity. There are currently IBA programs in Europe, Africa, the Middle East, Asia, and the Americas.

The Canadian BirdLife partners are the Canadian Nature Federation (CNF) and Bird Studies Canada (BSC). The Canadian IBA program is part of the Americas IBA program which includes the United States, Mexico, and 17 countries in Central and South America. The Federation of Ontario Naturalists is responsible for implementing conservation planning for IBAs in Ontario.

The goals of the Canadian IBA program are to:

- identify a network of sites that conserve the natural diversity of Canadian bird species and are critical to the long-term viability of naturally occurring bird populations;
- determine the type of protection or stewardship required for each site, and ensure the conservation of sites through partnerships of local stakeholders who develop and implement appropriate on-the-ground conservation plans; and
- establish ongoing local involvement in site protection and monitoring.

IBAs are identified by the presence of birds at sites falling under one or more of the following internationally agreed-upon categories:

- 1) sites regularly holding significant numbers of an endangered, threatened, or vulnerable species;
- 2) sites regularly holding an endemic species, or species with restricted ranges;
- 3) sites regularly holding an assemblage of species largely restricted to a biome;
- 4) sites where birds concentrate in significant numbers when breeding, in winter, or during migration.

While the program at all stages is a voluntary one, the advantages of IBA recognition extend beyond those of conservation alone. There can be increased awareness of the true worth of the site among the local community, and community involvement can result in diverse groups working for a common cause.

In Ontario as of 2001, the Federation of Ontario Naturalists is conducting community conservation planning in approximately 20 sites. Community conservation planning means engaging the local community in the development and implementation of the conservation plan. Greater Rondeau IBA is a unique blend of habitats and people – expansive forests, sprawling wetlands, a highly productive bay, and some of the most valuable vegetable-growing farmland in the province. Innovative approaches such as IBA conservation plans are intended to be tools for stakeholders and interested parties and individuals to further bird conservation at their site.

3.0 IBA Site Information

3.1 Location and Description

Site: Greater Rondeau Area IBA, # CAON007G

Location: 42°15' N, 81°53' W

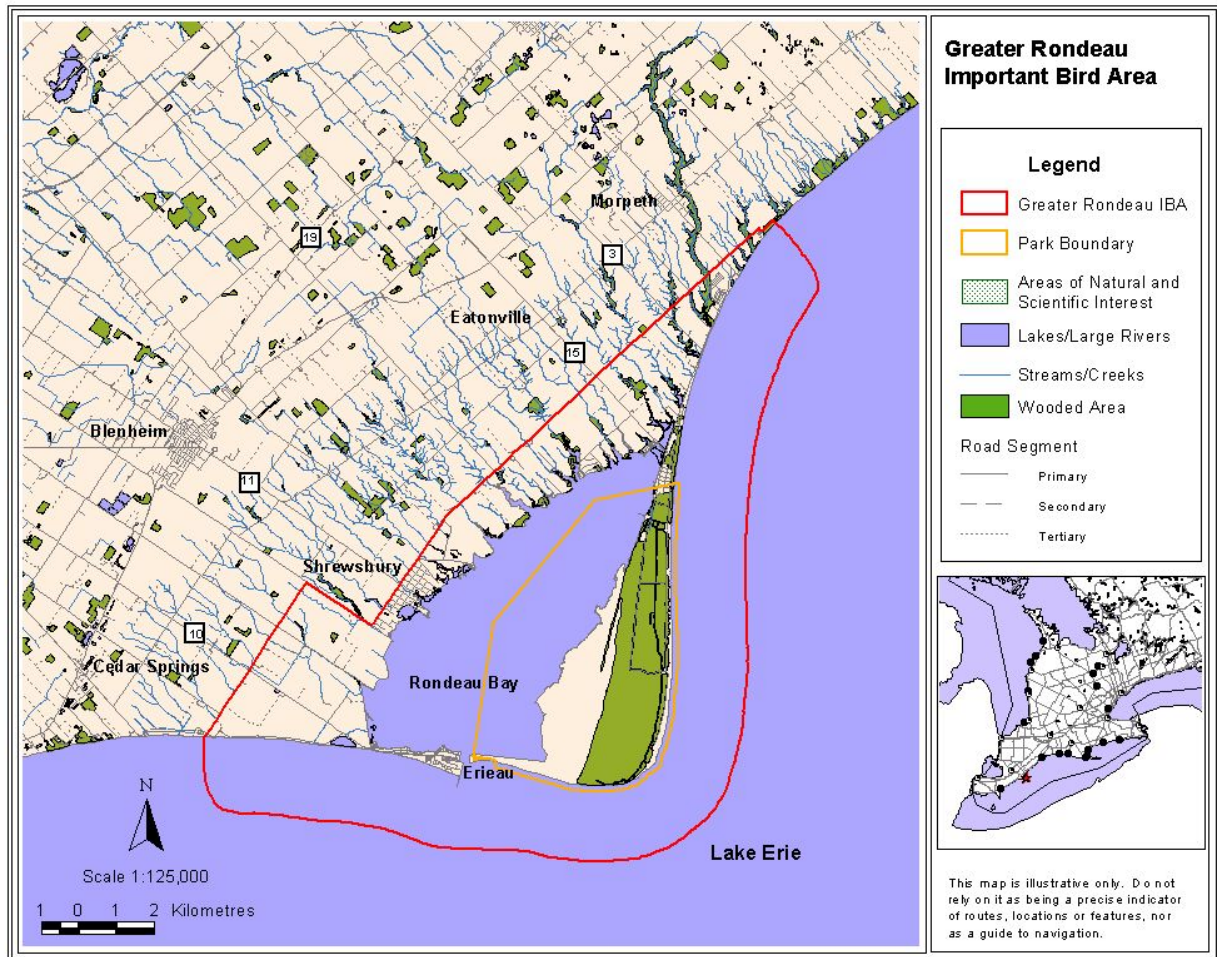
The Greater Rondeau Area IBA is situated on the shoreline of Lake Erie in the Municipality of Chatham-Kent (population 110,000), about 35 kilometres southeast of Chatham, about 10 kilometres southeast of Blenheim, and about 15 kilometres south of Ridgetown (Statistics Canada 1996). The IBA boundary extends from Erie Beach, along Bisnett Line to Fargo Road, extending the length of New Scotland Line to where it intersects with Rose Beach Line southeast of Morpeth (see Figure 1). On the lake the boundary extends 2 kilometres offshore from the mainland and peninsula. The total IBA area is 14,099 hectares, whereas the core area of the IBA, Rondeau Provincial Park, is 3,298 hectares or 23.4 percent of the IBA.

Rondeau Provincial Park and Rondeau Bay are well known to anglers, naturalists, vacationers, and waterfowl hunters throughout southern Ontario and neighbouring American states. Beyond the park and the bay, the buffer zone of the IBA is mainly agricultural land (vegetables and seed crops), coastal marsh, and a few small settlements. Notable natural features outside of the park, but in the IBA, include Bates Marsh and McGeachy's Pond.

The Lake Erie shoreline, including the Greater Rondeau Bay IBA, experiences a modified climate throughout the year with cooler springs and warmer falls than the inland portion of the Lake Erie Lowland Ecoregion (Environment Canada 2000). Winter temperatures are slightly higher than inland temperatures while summer temperatures are distinctly lower. The weather is highly changeable because the shoreline of Lake Erie lies along one of the major storm tracks of North America. Generally, the Greater Rondeau Bay IBA receives more precipitation than inland portions of the ecoregion, although in winter the amount of snowfall is low (McKeating 1989).

Rondeau Provincial Park includes an eight kilometre peninsula, a portion of Rondeau Bay, and an access zone that extends 150 metres into the nearshore waters of Lake Erie. From its narrow one-half kilometre base, the peninsula widens to about five kilometres along its southern edge. A spit of land extends from the southern beach of the peninsula westward, almost meeting a spit of land extending eastward from the main shoreline. Between these spits, a narrow 100-metre dredged channel joins the bay and the lake. This peninsula is a landform termed a cusped foreland (McKeating 1989), thought to be one of the best examples of such a feature in the world (Woodliffe, 2001). Its unusual shape is the result of continuous interaction among wind, wave forces, and water currents. These forces move sand along the lake's shoreline from the 20-30 metre high Morpeth Cliffs which lie just outside the eastern boundary of the IBA. Eroding sand, converging lake currents, and changing lake levels over thousands of years have created a series of sloughs and parallel dry ridges that extend the length of the peninsula (Rondeau Provincial Park 1998). Only five metres separate the ridges at the base of the peninsula whereas at the lake end the midpoints of the ridges may be 50 metres apart.

Figure 1. Greater Rondeau Important Bird Area: Boundaries



In the mid-1980s lake levels were the highest ever recorded, dramatically eroding and reshaping the southern end of the peninsula and the barrier beach. Lake levels and shoreline processes, affected by shoreline hardening along Erie Point, continue to alter the beaches, plant communities, and the entrance to the bay.

This unusual peninsula supports an equally unusual plant cover in the form of one of the largest remnant stands of Carolinian forest in Canada. In total, the Municipality of Chatham-Kent is covered with less than 4 percent native trees and shrubs, of which Rondeau alone represents 2 to 3 percent (Woodliffe 1996). Other communities within the IBA include freshwater marshes, an open shallow bay, savanna, and beach dune communities. Along the northwest shore of Rondeau are predominantly agricultural lands with small marshy edges and some wet fields in season, remnants of a more extensive marshland community reclaimed for agriculture.

West of the bay a dyke runs for a few kilometres along the mainland separating the shoreline from reclaimed marshland. Along the shoreline there are cottages accessed by a road on the dyke. The deep black loamy soil of the reclaimed marsh provides excellent soil for growing onions and other market vegetables. The soils of the peninsula are shallow, overlying the much deeper layer of sand.

4.0 IBA Species Information

The Greater Rondeau Area IBA is a globally significant IBA for both threatened and congregatory species (Canadian IBA Database 1999). The variety of habitats within this IBA contributes to the significant bird diversity.

Threatened species within the IBA include songbirds and marshbirds (Table 1). Rondeau Provincial Park has traditionally supported the largest breeding population of Prothonotary Warblers, a Nationally and Provincially Endangered Species, in Canada. In 2000, 13 pairs represented 65 percent of the known breeding population in Canada. Rondeau Provincial Park has historically been described as one of the more consistent locations in Canada for breeding Acadian Flycatcher, a Nationally Endangered Species (Goodwin 1995). In 1997, four males on territory represented 4 percent of the national population, though none was recorded in 1999, 2000 or 2001 (Dobbyn, pers comm.). This is likely due to the loss of the forest canopy following the 1998 windstorm. The park has also traditionally been home to many breeding pairs of Red-headed Woodpecker and Cerulean Warbler, both Species of Concern Nationally and Vulnerable Provincially.

The sighting of two individual King Rails in 1997 suggests that perhaps as much as 2 percent of the national population of this Nationally and Provincially Endangered Species occurs within the IBA. Breeding status remains uncertain because monitoring marshbirds such as King Rail is difficult in an extensive marsh area. Forster's Tern, a species of undertermined status both federally and provincially, has nested consistently since 1981, although numbers of nests have varied dramatically. In 1990 and 1991, 200 nests were estimated, representing 1.1 percent of the global population and 4.8 percent of the national population of Forster's Tern. In 1992, however, only three nests were recorded. In 1997, nine Least Bittern, a Species of Concern Nationally and Vulnerable Provincially, were recorded during monitoring. Again the inaccessibility of the marsh suggests that it is highly probable that there would be more than nine pairs. The observation of nine pairs would constitute approximately 1 percent of the national population.

The nearshore waters of Lake Erie, Rondeau Bay, and adjacent marshes are major staging areas for waterfowl. Tundra Swan and Greater Scaup are present in significant numbers that meet IBA criteria for congregatory species. As much as 4 percent of the global population of Tundra Swan and as many as 3.2 percent of the global population of Greater Scaup have been recorded in this IBA in March. Peak numbers of waterfowl, observed during spring migration in the mid-1990s, total more than 33,000 individuals, thus meeting IBA criteria under the congregatory threshold for waterfowl. Many historical records for several waterfowl species (prior to 1981) are well beyond current IBA threshold numbers (see footnote to Table 1). Shorebirds congregate in significant numbers on the agricultural fields, beaches, and marshes. During some years, thousands of Black-bellied Plovers and American Golden-Plovers have been observed migrating through the IBA. While there are no accurate recent counts, Woodliffe recorded 3,000 American Golden-Plovers in 1976 and 2,200 Black-bellied Plovers in 1977 which are the figures used for this plan. In 1984 1,200 Whimbrels

were observed in the IBA, representing 4.8 percent of the global population (Woodliffe, pers comm., 2001).

Two species not addressed in this plan but listed on the IBA Summary Sheet are Common Goldeneye (*Bucephala clangula*) and Ruddy Turnstone (*Arenaria interpres*). In March 1995, 7,000 Common Goldeneyes were recorded at Rondeau. Revised thresholds for this species place the North American and global threshold at 12,500 (Bird Studies Canada, 2000). Likewise, a May 1996 record of 350 Ruddy Turnstones falls well short of the IBA criteria of 1 percent of the continental or global population. A recent population estimate for this species places this record as only 0.15 percent of the North American population (Morrison, 2001).

Table 1: Threatened and Congregatory Species Recorded at Greater Rondeau Area IBA and their Percentage Occurrence (Canadian IBA Database 1999)^{2,3}

Common Name Scientific Name	Highest Annual Count (year)	Significance	% of population
Prothonotary Warbler <i>Protonotaria citrea</i>	13 pairs (2000)	National	65%*
Acadian Flycatcher <i>Empidonax vireescens</i>	4 territories (1997)	National	8%
Red-headed Woodpecker <i>Melanerpes erthrocephalus</i>	15-20 pairs annually	National	1%
Cerulean Warbler <i>Dendroica cerulea</i>	10 pairs (1997)	National	1%
King Rail <i>Rallus elegans</i>	2 individuals (1997)	National	2%
Least Bittern <i>Ixobrychus exilis</i>	9 territories (1997)	National	< 1%
Forster's Tern <i>Sterna forsteri</i>	200 pairs (1990-91)	Global	1.1%
Tundra Swan <i>Cygnus columbianus</i>	8,500 (March 1996)	Global	4% ⁺
Waterfowl concentration	33,000 (peak spring #s)	Global	
Greater Scaup <i>Aythya marila</i>	23,500 (Dec. 1999)	Global	3.2%
Black-bellied Plover <i>Pluvialis squatarola</i>	2200 1977	Continental	1%
American Golden Plover <i>Pluvialis dominica</i>	3000 1976	Continental	2%
Whimbrel <i>Numenius phaeopus</i>	1200 (May 23, 1984)	Global	4.8%

* Dobbyn, S., pers comm., 2000

⁺ eastern population

² These numbers are based on records since 1981 (the last 20 years from the time of publication of this report).

³ Higher numbers for many species have been recorded historically. For example, Woodliffe reported the following numbers for from the 1970s: Tundra Swan 10,000, March 1978; American Black Duck 6,000, December 26, 1970; Lesser Scaup 6,300, December, 1999; Red-breasted Merganser 20,000, March 1980; Black-bellied Plover 2,200, April 29, 1977; American Golden-plover 3,000, April 18, 1976. In addition, the following two older records are noteworthy: Redhead 8,000 on April 2, 1950; Canvasback 9,000, April 1, 1951.

4.1 Threatened Species

If there is any animal or plant that we want to have with us now and forever, we must provide it with habitat – somewhere it can live. This is so obvious that it is continually being forgotten.

– W. E. Ricker

4.1.1 The Songbirds

4.1.1.1 Prothonotary Warbler *Protonotaria citrea* - Endangered Federally and Provincially

Photograph by P. Allen Woodliffe

The Prothonotary Warbler is recognized by its brilliant, golden-yellow head and underparts, blue-grey wings without wingbars, and a blue-grey tail with obvious white patches. The lack of wingbars and black eyeline distinguishes this warbler from Blue-winged Warbler (*Vermivora pinus*) that is similar in colour. The more common Yellow Warbler (*Dendroica petechia*) has reddish streaks on the breast and belly, which prevents confusion with Prothonotary Warbler.

Distribution and Abundance

The Prothonotary Warbler breeds throughout the eastern United States to the Mississippi Valley and into southwestern Ontario where its range is primarily restricted along the Lake Erie shoreline from Holiday Beach and Big Creek Marsh IBA to Point Abino (McCracken 1997).

This warbler is also found at Cootes Paradise, Hamilton. Traditionally, the main breeding areas in Ontario have been Rondeau Provincial Park and Long Point.

The number of breeding pairs of Prothonotary Warblers in Ontario has declined dramatically from 80 in the early 1980s to an estimated maximum of 20 breeding pairs in 2000 (McCracken 1997; 2000). At present the Prothonotary Warbler is considered Endangered in Canada. It was regulated as an Endangered Species on Ontario's Endangered Species Act in 2000.

The Prothonotary Warbler is most abundant in the southeastern United States; populations are declining elsewhere (McCracken 1997). With most of the deciduous swamp forest in its Canadian breeding range already drained, maintaining the remaining remnants is vital to the survival of this species in Canada. McCracken (2000) reviews the factors that may be contributing to its decline. The Prothonotary Warbler Recovery Team, established in 1996, is undertaking field studies to respond to these four factors:

- shortage of cavity nest sites in key breeding areas;
- competition for nest cavity sites by House Wrens (*Troglodytes aedon*) and Tree Swallows (*Tachycineta bicolor*);
- a relatively high rate of Brown-headed Cowbird (*Molothrus ater*) parasitism; and
- significant nest predation by raccoons (*Procyon lotor*).

Natural History

Territories are established in deciduous swamps of various types: silver maple-red maple (*Acer rubrum*), buttonbush (*Cephalanthus occidentalis*), or black willow (*Salix nigra*)-maple-ash. Selected habitat invariably has open pools of standing or flowing water, and the water component is usually at least one hectare in area (McCracken 1987, 2000).

The Prothonotary Warbler is the only warbler in eastern North America to build a nest in a tree cavity. Natural cavities in tree stumps or fallen branches are suitable, although cavities made and previously used by Black-capped Chickadee (*Parus atricapillus*) or Downy Woodpecker (*Picoides pubescens*) may be preferred (Peck and James 1983; Dobbyn, pers comm.). A large variety of man-made materials may serve as nest cavities as well (McCracken 2000a). For example, nest box programs in Michigan were quite successful using waxed cardboard milk containers. The cavity site is highly variable, but nesting material is not: moss is a critical habitat requirement for constructing the nest (ibid.).

The Prothonotary Warbler is strongly territorial (Morse 1989). The male Prothonotary Warbler often builds more than one nest in its territory. These alternate nests are referred to as "dummy nests," and they may play a significant role in attracting a mate, reducing competition, or negating predation (McCracken 2000b). Once the female selects a nest, she lays and incubates four to five eggs. This incubation period lasts about 12 days; the young fledge the nest in another 10 to 12 days.

By mid-August, Prothonotary Warblers begin to migrate south to southern Central America and the northern mangrove coasts of Columbia and Venezuela. Since 1966, an estimated 30 percent of this

habitat has been lost (McCracken 2000a). Recent destruction of mangrove forests for resort development and shrimp aquaculture along Latin American coastlines is a further threat to this warbler. Such coastal forests provide winter habitat for approximately 80 percent of the Prothonotary Warbler population (ibid.).

4.1.1.2 Acadian Flycatcher Empidonax virescens - Endangered Federally

To describe the Acadian Flycatcher as a small, grey bird with an olive-green tinge, two white wing bars, and eye rings is to describe a dozen *Empidonax* flycatcher species that inhabit North America – five of which are regularly observed in Ontario. On the other hand, to hear such a bird give its unique and explosive two-note song, “*peet-sah*,” during breeding season in appropriate habitat (see below) identifies it as Acadian Flycatcher. Kaufman (1990) thoroughly describes and discusses the identification of *Empidonax* flycatchers. Salabanks (1999) summarizes the natural history of the Acadian Flycatcher.

Distribution and Abundance

The breeding range of Acadian Flycatcher extends throughout the eastern United States, north to the Great Lakes and southern New England. In Canada its distribution is confined to the Carolinian forest and the southern edge of the Great Lakes forest regions of Ontario. Widespread and common in the United States, the Acadian Flycatcher is designated an Endangered species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Martin et al. (1999) estimate the Canadian population to be between 50 and 75 pairs. Today its breeding habitat in southwestern Ontario is interspersed within an intensively farmed and urbanized landscape. Whether its rarity is a result of deforestation or whether it has always been rare is impossible to determine (Friesen and Martin 1999).

Natural History

The Acadian Flycatcher arrives in Ontario during mid-May from its winter range in central and northern South America. Its preferred habitat is under large deciduous trees that form tall, closed canopies and a relatively open understorey, often near a stream. Although considered a forest-interior species requiring woodlots of 100 hectares or more, this flycatcher also occurs in narrow ravines having little or no forest-interior habitat. Such ravines are suitable habitat if they have closed canopies above a stream, slough, or even standing water (Friesen and Martin 1999, Martin et al. 1999). The open understorey provides Acadian Flycatcher with its foraging habitat where it hawks insects out of mid-air, preying upon wasps, ants, bees, small beetles, moths, flies, and mosquitoes.

The female builds a nest unlikely to be mistaken for that of any other species. Using a variety of plant parts and spider webbing, she forms a shallow basket that is attached hammock-fashion in a twig-fork toward the end of a lower branch of a large tree. The nest is often located over a stream or a trail about four metres off the ground. Long streamers of fibrous material hang from below the nest to give it an unkempt appearance. The female incubates a clutch of three eggs for about two weeks while the male actively defends the nest site, his call notes or song often betraying the nest's presence. Nest predators include Blue Jay (*Cyanocitta cristata*), Common Grackle (*Quiscalus*

quiscula), raccoons, and squirrels. The incidence of cowbird parasitism varies and, based on research in Indiana (Salabanks 1999), is lowest in forest-interior sites and highest in forests adjacent to agricultural fields. The effects of predation and parasitism on this species in Ontario are under study (Friesen and Martin 1999).

Acadian Flycatcher populations have declined at Rondeau. No territories were recorded for this species in either 1999, 2000, or 2001. A severe windstorm in 1998 radically changed the character of the Rondeau forest, opening the canopy where trees were blown over. These habitat changes are likely behind the recent absence of breeding records of this species in the Rondeau Prov. Park.

4.1.1.3 Cerulean Warbler *Dendroica cerulea* - Species of Concern Federally, Vulnerable Provincially

High in the canopy of tall deciduous trees lives the diminutive Cerulean Warbler. Its buzzing, weak song is often the only clue of its presence. The upperparts of adults are sky blue with variable black streaking, while the underparts are white with dark streaking on the flanks and a conspicuous black breast band. Hamel (2000) describes the natural history of this species.

The breeding range of Cerulean Warbler is limited to central eastern United States from northern Mississippi to central Wisconsin, and eastern Oklahoma to eastern Virginia, and parts of southeastern Canada including southern and south-eastern Ontario and extreme southwestern Quebec (Eagles 1987a, Bannon et Robert 1995, Hamel 2000). This warbler migrates to the east and west slopes of the Andes in Columbia, Venezuela, Ecuador, and Peru, where it spends the balance of the year (Hamel, 2000).

Historical populations for this species have declined in many parts of its range, particularly in lowland forests along the Mississippi and Ohio Rivers. Breeding Bird Survey (BBS) results show that this species declined at a rate of 3.7 percent per year from 1966 to 1996 (ibid.). This decline was the steepest for all species of warbler between 1966 and 1986 (Robbins et al. 1992), though the accuracy of BBS at sampling populations of forest interior species such as the Cerulean Warbler has been questioned (Peterjohn et al. 1995). In Ontario, the Atlas of Breeding Birds conducted between 1981 and 1985 illustrated two distinct bands of breeding activity: one band included parts of southwestern Ontario, while the second was along the southern edge of the Canadian Shield, extending from north of Kingston towards Georgian Bay (Eagles, 1987). Rondeau has traditionally been a southern Ontario stronghold for this species.

Cerulean Warbler gleans insects and other small organisms from leaves and twigs in the forest canopy. Its nest is a small, open cup made of fine plant material and spider or caterpillar web. The nest is typically constructed on a lateral branch in the middle to upper canopy and is usually concealed by vegetation. Nests contain two to five eggs, averaging 3.5 eggs per nest (Hamel, 2000). Brown-headed Cowbird is known to impact this species' nesting success in parts of its range. 18 percent of 36 nests reported for the Ontario Nest Record Scheme were parasitized (Peck and James, 1987). Blue Jay, a species that is very successful in settled areas, is known to prey on eggs and nestlings (ibid.).

In Ontario, Cerulean Warbler arrives on breeding grounds in early to mid May. The species is considered by many to be loosely colonial (Hamel, 2000). Very little information exists on departure dates from Ontario, though in Michigan and Quebec, departure takes place from late July to early September (ibid.).

Hamel (2000), describes four threats to this species' breeding habitat:

- Loss of mature deciduous forest, especially along stream valleys;
- Fragmentation and increasing isolation of remaining mature deciduous forest;
- Forest management practices resulting in shorter rotations and even-aged management; and
- Loss of key tree species such as elm and oaks to disease.

On migration, in addition to loss of stopover habitat, collisions with stationary or moving structures such as sky scrapers or relay towers, takes a toll on this species. Wintering habitat is threatened, as montane subtropical forest is converted to pasture and crops such as coca and coffee (ibid.).

Like the Acadian Flycatcher, Cerulean Warbler prefers tall closed-canopy forests. Cerulean Warbler populations at Rondeau were likely heavily impacted by the 1998 windstorm, which transformed the large areas of the closed canopy forest habitat to open woodland.

4.1.1.4 Red-headed Woodpecker *Melanerpes erthrocephalus* - Species of Concern Federally, Vulnerable Provincially

This woodpecker cannot be mistaken for any other. The entirely red head, neck, and throat identify adult birds. At all ages, whether perched or flying, this bird exhibits a conspicuous white rump and inner wing patches. The natural history of Red-headed Woodpecker is described in Winkler et al. (1995) and Kaufman (1996).

Historically, the breeding range of this woodpecker extended throughout most of eastern and central North America. Although it was once considered very common throughout eastern North America, its range has shrunk significantly (Godfrey 1986), and its present distribution throughout its historic range is sporadic. In Canada it breeds from southern Saskatchewan east to the St. Lawrence Lowlands of Quebec. This woodpecker occurs sporadically throughout southern and central Ontario, north to the vicinity of Sault Saint Marie, and west to the Lake of the Woods region. In southwestern Ontario, populations have fluctuated in response to changes in the landscape (Woodliffe 1996). Red-headed Woodpecker was probably common in oak savanna habitat prior to European settlement. In the 1800s, the clearing of forests for farmland resulted in hedgerows and forest edges adjacent to these lands, creating suitable habitat. In the mid-1900s, elms dying of Dutch elm disease provided both foraging and nesting opportunities.

Short-distance diurnal migrants, most Red-headed Woodpeckers winter in the American Midwest and the Mississippi Valley, although a few winter in woodlots in southwestern Ontario. They arrive on territory in central Ontario in early to mid-May. This woodpecker avoids the dense forest interior,

favouring open woodland or clearings, forest edges, orchards, open pine woods, or groves of tall trees in open country. Components of its habitat include clumps of trees, bushes, and hedgerows. The female chooses the nest site while the male does most of the excavation of the cavity, often in a dead tree, though sometimes in a fence post or utility pole. Excavation takes 12 to 14 days. Normally four or five eggs are laid, incubation lasting 12 to 13 days, with both male and female sharing incubation and brooding equally. The young fledge after 31 days. A second brood may be raised in the same cavity, although usually a new one is made. The Red-headed Woodpecker nests later than any other woodpecker; young have been observed in the nest cavity as late as the second week of September.

The Red-headed Woodpecker is an opportunistic feeder, feeding on insects, spiders, earthworms, seeds, acorns, and various wild and cultivated fruit. It forages in a variety of habitats from the ground to treetops. In addition to drilling holes in trees to find food, it will typically swoop down from roadside perches capturing insects on the wing; flying insects are the important part of its diet. It stores food in cavities and then blocks the opening with damp woodchips that harden, sealing in the cache (Axley 2000).

The introduction of the European Starling (*Sturnus vulgaris*) into North America in the 1890s contributed to the decline of the Red-headed Woodpecker. Starlings compete for nesting holes and aggressively drive woodpeckers from these cavities. Other factors have also contributed to the decline of the species. In the United States during the last century the Red-headed Woodpecker was hunted to reduce damage attributed to it in fruit orchards and on utility poles. The removal of dead trees from farms, park-like woodlands, golf courses, and managed woodlots has resulted in a loss of nesting and foraging habitat.

Red-headed Woodpeckers are a common breeding bird at Rondeau, numbering over ten pairs most years. They occur over a range of habitats from slough forest to savanna.

4.1.2 Marshbirds

4.1.2.1 King Rail *Rallus elegans* - Endangered Federally and Provincially

About the size of a domestic chicken, the King Rail is a large, long-billed marsh bird that is more often heard than seen. A brief glimpse of this rail may be insufficient for the inexperienced observer to identify it, for in appearance the King Rail is quite similar to the more common Virginia Rail (*Rallus limicola*), though it is considerably larger.

Distribution and Abundance

The King Rail inhabits marshlands throughout much of eastern North America from the Gulf of Mexico to the Great Lakes region, and from the Atlantic coast west to the Great Plains. Populations also exist in the Greater Antilles and interior of Mexico. In Canada this rail is found only in southern Ontario. While the populations of the southern United States' coastal wetlands are doing well (Wemer 1997), elsewhere this rail is in serious trouble, and populations have been in

severe decline since the 1940s. This has been the case for inland populations in the Midwest: Ohio, Michigan, Iowa, and Missouri. What makes the decline so noteworthy in Ohio is that in the early part of the twentieth century King Rail was the most abundant breeding rail in some of the Lake Erie marshes in that state (Friesen 1999).

Likewise in Ontario, anecdotal accounts indicate that the King Rail was a common breeder a century ago in the large marshlands of western Lake Erie and Lake St. Clair. Results from the Atlas of the Breeding Birds of Ontario, 1981-85, indicate that King Rail had become very rare in this breeding area, with the exception of Walpole Island marshes, considered the main breeding location in Ontario (McCracken and Sutherland 1987). Although atlas data are inconclusive about the population trend in Ontario, population numbers have declined in many parts of North America. Breeding Bird Surveys recorded a significant decrease from 1966 onwards with the King Rail being “Blue listed” from 1976 to 1982. The King Rail is endangered in all states bordering Lake Erie except New York, where it has always been rare. It was regulated as an Endangered Species by Ontario’s Endangered Species Act in 2000.

In 1997 an intensive search for King Rails was undertaken in southwestern Ontario. A total of 32 were located on territory in seven marshes; more than half of these rails were in Walpole Island marshes (ibid.). The 1981-85 atlas survey suggests a breeding zone from Bruce Peninsula east to Kingston with several possible but no confirmed breeders. Marshes scattered across this region and remaining fragments in southwestern Ontario may provide suitable habitat.

Natural History

Meanley (1992) and Reid et al. (1995) describe the natural history of the King Rail. Its habitat is that of the muskrat (Meanley 1992). In wildlife refuges, two key components of this habitat are evident: densely vegetated sites with tussocks in shallow water for nesting and dry patches or swales of tall, dense vegetation for brood foraging and hiding during mid-day (del Hoyo 1996d). Even shallow water in broad roadside ditches with cattails, or shrub swamps, or upland fields near water may provide habitat.

The King Rail places its nest in a clump of vegetation, usually up to 30 cm above the highest watermark. Nest success is significantly related to both water depth and distance to open water. Clutch size is 10 to 12 eggs, and the large brood remains with the adult pair for at least 30 days after hatching. Initially, the parents feed the young; however, at six weeks the young are feeding themselves though they remain in the company of their parents (Meanley 1992). King Rails are omnivores, although crayfish and aquatic insects are their main food. Foraging is mainly diurnal and always within a few steps from cover.

Raccoon, Red Fox (*Vulpes vulpes*), Striped Skunk (*Mephitis mephitis*), and mink (*Mustela vison*) prey on King Rails, especially their nests. Both Great Horned Owl (*Bubo virginianus*) and Northern Harrier (*Circus cyaneus*) prey upon adults. In marshes close to human habitation, cats and dogs may kill adults as well as young since these rails are reluctant to flush (Reid, Meanley and Fredrickson 1995).

The main stronghold of King Rail in Ontario is Walpole Island. The remaining King Rails in

southern Ontario have been observed mainly in or near Ducks Unlimited projects (Wemer 1997) where marshes are maintained in a “hemimarsch” condition (i.e., about half diverse marsh of emergent vegetation and about half open shallow water). Pittaway (1997) argues that many of Ontario’s Great Lakes coastal marshes are in lockup stage (i.e., nutrients are “locked up” in standing dead cattails, and marshes become stagnant and filled in with dense vegetation) due to relatively stable water levels. These marshes have relatively low species diversity as compared to a hemimarsch. Meanley (1992) suggests that the best opportunity for long-term survival for the King Rail is on managed waterfowl refuges. Many factors impact negatively on King Rails: in general, water depth greater than 25 cm; chemical contaminants that reduce crayfish and aquatic insects; mammalian predators, particularly in fragmented marshes; and *Phragmites* and Purple Loosestrife (*Lythrum salicaria*), which compromise the quality of the habitat.

Censusing King Rails (and other marshbirds) at Rondeau is a considerable challenge, given the difficulties in accessing much of the marsh, particularly with the low water levels of 1999 to 2001.

4.1.1.2 Least Bittern *Ixobrychus exilis* - Species of Concern Federally, Vulnerable Provincially

Least Bittern is the smallest (28-36 cm) and most inconspicuous of the herons. Its presence in the dense emergent vegetation it favours is often revealed by its dove-like cooing, a glimpse of its brief flight across the marsh, or perhaps when exposed in the “freeze” position,” bill pointed skyward, feathers compressed, and eyes in apparent contact with observer.

Distribution and Abundance

The breeding range of the Least Bittern extends from southeastern Canada through the eastern United States, Mexico, Costa Rica, and well into South America. Its winter range is best described in terms of temperature: south of regions with prolonged winter frosts including the Atlantic coastal plain, the Gulf of Mexico coastline, and regions to the south.

In Canada the Least Bittern nests in southern Manitoba east to the Maritimes, including New Brunswick and possibly Nova Scotia. In Ontario it breeds predominantly to the south of the Canadian Shield. The large marshes of the lower Great Lakes continue to provide the most extensive habitat together with the smaller marshes that dot the landscape south of the Shield in the Peterborough area. Since the 1960s, a decline in numbers has been documented in several regions of Ontario (Austen et al. 1994). States bordering Ontario (i.e., Michigan, Ohio, and New York) have also experienced declines.

Natural History

The natural history of the Least Bittern is well described by Gibbs et al. (1992) and its status, particularly in Ontario, is well summarized by Sandilands and Campbell (1988). The Least Bittern selects freshwater or brackish marshes with tall, dense emergent vegetation, (e.g., cattails), which may include clumps of woody plants over deep water up to one metre. Areas of open water occupying as much as 50 percent of the marsh and interspersed throughout this vegetation are

preferred. It avoids dry conditions and benefits from stable water levels. Breeding pairs are not strongly territorial and are usually solitary nesters, but under ideal conditions Least Bitterns appear to be loosely colonial (Sandilands and Campbell 1988). Nest density ranges from one to 15 nests/hectare; however, one nest/hectare appears to be typical.

The nest is an elevated platform with an overhead canopy built of emergent vegetation. The Least Bittern creates the canopy by pulling down and crimping the cattails surrounding the nest. The nest site is within the dense, tall stands of emergent vegetation well above the water level and usually less than 10 metres from open water or from channels made by muskrats. The depth of water below the site ranges from eight centimetres to almost a metre. Clutch size ranges from two to seven eggs, the usual number being three or four. Nesting success varies from 20 percent to 73 percent, depending upon the location of the nest within the cattail marsh. Nests along the periphery of the marsh tend to be least successful (Gibbs et al. 1992).

Least Bitterns stalk their prey, predominantly small fish and dragonflies, along the open water side of emergent vegetation. They cling to the vertical stems and shoot by grasping them with their long toes and curved claws. At particularly productive feeding sites, they may build foraging platforms that may later become hunting platforms for young bitterns. These platforms and hunting techniques permit Least Bitterns to forage over marsh water as deep as that used by large herons (i.e., 25-60 cm deep) although most feeding occurs at the water's surface. Predators include Snapping Turtles (*Chelydra serpentina*) from below and Red-tailed Hawks (*Buteo jamaicensis*) and Northern Harriers from above. Marsh Wrens (*Cistothorus palustris*) are known to puncture Least Bittern eggs, while American Crows (*Corvus brachyrhynchos*) and mink take both eggs and nestlings. Where water depth below the nest offers insufficient protection, raccoons become significant predators.

Several factors threaten the breeding habitat of the Least Bittern and even the bird itself. The most serious threat is the destruction or loss of wetlands. In southern Ontario, wetlands have been converted to other uses: primarily agricultural reclamation and urbanization. Since pre-settlement times, almost 70 percent of the Ontario wetlands south of the Precambrian Shield have been lost (Sandilands and Campbell 1988). Some of these wetlands would have provided habitat for Least Bittern. Wetlands that remain do not necessarily guarantee appropriate habitat. In agricultural areas, siltation from erosion and runoff containing pesticides may degrade nesting and/or foraging habitats. The habitat may also become degraded by Purple Loosestrife and/or *Phragmites* invading the marsh. Natural succession within a marsh makes it uninhabitable for Least Bitterns. High water levels may also eliminate habitat. Storm water runoff from urban or agricultural areas appears to create conditions that make these bitterns vulnerable to parasitic nematode worms (Gibbs et al. 1992). Personalized watercraft (e.g., Sea-doo's) entering open water areas of marshes produce wakes that may disturb foraging or nesting birds. The provincial policy to classify Southern Ontario wetlands and identify those that are provincially significant was established in a large part to encourage protection of wetland dependant species such as the Least Bittern.

4.1.2.3 Forster's Tern *Sterna forsteri* - status undetermined

The Forster's Tern is a white, black-capped tern with a black-tipped orange bill. In flight the upper wing shows silvery white in the primaries, which lack the distinctive dark wedge found in the

similar Common Tern. The natural history of Forster's Tern is briefly summarized in del Hoyo (1996a); Austen and Cadman (1994) document its Canadian status.

Distribution and Abundance

Although Forster's Tern was reported in Lake St. Clair marshes in the latter half of the 1800s, documentation of nesting in Ontario did not occur until 1976. Evidence suggests that high water levels in Lake Erie during the 1970s and 1980s contributed to both an increase in numbers and range expansion in southwestern Ontario. By the mid-80s, numbers at specific sites were at an all time high (McNicholl 1988). These breeding sites included Long Point and Rondeau Bay on Lake Erie, Walpole Island and St. Clair National Wildlife Refuge on Lake St. Clair, and Kettle Point on Lake Huron. In Ontario, populations of Forster's Tern are small and highly localized and considered provincially rare (Austen and Cadman 1994). Only in Lake St. Clair marshes are their numbers increasing (Martins 1997).

The Forster's Tern breeds in freshwater marshes of the North American interior and the salt-water marshes of the American Atlantic, Gulf, and Pacific coasts. In Canada, it breeds primarily in the prairies, with small populations in both southeastern British Columbia and southwestern Ontario. Its winter range includes North Carolina to the Gulf of Honduras and southern California to Panama.

Natural History

Forster's Terns tend to arrive earlier in southwestern Ontario than other breeding tern species: early April, occasionally in March, and in numbers by mid-April (Fazio et al. 1985). This tern feeds mainly on small fish (5-7 cm), aquatic insects, and crustaceans by hunting over water less than a metre deep. This tern nests in either compact or loose colonies of five to 250 pairs (del Hoyo 1996a). Nesting sites are often in inaccessible deep-water marshes; nevertheless, nest site location may be determined by watching for courtship behaviour, which is both conspicuous and prolonged (McNicholl 1988).

Nests are usually placed on floating mats of vegetation and mud but also on muskrat lodges. Artificial nest sites include floating boards and dredge-spoil islands. Use of such sites may be due to loss of marsh habitat. Nest losses are due to predation, muskrat activity about the nest site, and even disturbance by spawning carp. Changes in water levels due to either flooding or managed level changes may cause egg loss, chick mortality, or abandonment of nest sites (Austen and Cadman 1994). The wake from motorized watercraft in channels can inundate nests.

4.2 Congregatory Species

4.2.1 Waterfowl

4.2.1.1 Tundra Swan *Cygnus columbianus*

In southwestern Ontario the heralding of spring coincides with the arrival of Tundra Swans.

Their high-pitched, soft, melodious calls draw eyes skyward to catch their “flashing wings.” Recently, with the re-introduction of Trumpeter Swan to Ontario, observers need to be cautious with identification, though large flocks of Trumpeter Swans are unheard of in recent times. Both of these species are all white with black bill and feet, but the Trumpeter Swan is somewhat larger and longer winged. The deep, resonant trumpeting call distinguishes this swan at height and distance. At close range, a small yellow spot at the base of the bill near the eye distinguishes the Tundra Swan, although a small percentage lack this marking. Limpert and Earnst (1994) summarize the natural history of the Tundra Swan.

Distribution and Abundance

One hundred years ago, sightings of Tundra Swans were uncommon in Ontario, although they were occasionally sighted in the late 1800s near Lake St. Clair (Theberge 1989). Prior to the enactment of the Migratory Birds Convention Act in 1917, Tundra Swan numbers were greatly reduced by market hunting. By the 1920s, flocks numbering in the hundreds were reported annually from the Niagara River along the Lake Erie shoreline to Lake St. Clair (Taverner 1945, Gunn 1979). Today in southwestern Ontario upwards of 20,000 Tundra Swans have been recorded, primarily in a corridor from Long Point west to Greater Rondeau Area IBA and Eastern St. Clair IBA (Goodwin 1995).

Biologists recognize two populations of this North American swan based upon their wintering distribution. In 1999 the eastern population was estimated to be 109,000 and the western population 119,800 birds. The eastern population breeds from the arctic coastline of Alaska to southwestern Baffin Island. This population winters in coastal areas from New Jersey to South Carolina and traditionally in Chesapeake Bay, Maryland. Small numbers overwinter on the southern shores of Lake Erie (Limpert and Earnst 1994). The western population breeds along the coast of western Alaska and migrates along the Pacific Coast, wintering primarily in California, Utah, and the Pacific Northwest.

Natural History

Tundra Swans generally arrive in this IBA in peak numbers during the second half of March. Leaving their wintering grounds along the Atlantic Coast, they may stop-over in the Susquehanna River Valley, Pennsylvania, before arriving in southwestern Ontario. The spring journey is broken up into four or five trips of 500-1,900 kilometres each (Gunn 1979). Stops for rest and food at staging areas last from several days to several weeks. Flights, which last from six to 20 hours, are flown at altitudes of 600-1,800 metres.

Arriving in large numbers, the swans disperse in small to large groups throughout the agricultural fields of Chatham-Kent, particularly at Greater Rondeau Area IBA and Eastern St. Clair IBA, joining flocks of Canada Geese to feed on waste corn. Seeds, stalks, roots, and tubers of submerged and emergent aquatic vegetation may also be available, depending on ice conditions in the shallow waters of the marshes of Rondeau Bay. The presence of both these food choices makes these IBAs ideal stopover sites. The marshes and the adjacent agricultural fields of Chatham-Kent have not always been preferred resting and feeding stopover sites in southwestern Ontario. Until the early 1970s, large numbers of Tundra Swan congregated in the Long Point marshes. Deterioration of these

marshes and the increase in production of corn and winter wheat in southwestern Ontario have resulted in many flocks of swans dispersing to feed in a broad band from Long Point through Rondeau Bay to Lake St. Clair and the Chatham Flats and north to Grand Bend.

By early April the swans staging in southwestern Ontario are migrating to Minnesota, southwestern Manitoba, and Devil's Lake, a major staging area in North Dakota. From these locations, swans will strike northward to their breeding grounds, arriving in late May.

Tundra Swans are solitary nesters, and each nesting pair defends a large territory that may be two square kilometres. Nests in favourable locations may be reused annually. Monogamous, these swans usually do not breed until their fourth or fifth year; however, pair bonding may occur a full year earlier and territory defended without nesting. In fact, not all adult pairs will nest every year. Sometimes unusually cold or snow conditions in late spring prevent nesting.

Mortality is high among eggs due to predators and among cygnets due to inclement weather and starvation. Flocks of family groups leave the Arctic in late September arriving in North Dakota and Minnesota in early October. Swans may remain at these staging locations late into fall until freeze-up. When forced out, they generally fly 1,600 kilometres non-stop to the Atlantic coast, arriving between mid-November and end of December. Small numbers will stop in southwestern Ontario in the fall. In total Tundra Swans spend four or five months of every year migrating a distance of 6,000 kilometres along traditional pathways through the interior of North America.

Given their late maturity and high mortality rate, Tundra Swans have a low annual recruitment rate. Nevertheless, both eastern and western population levels exceed the Canadian and United States Wildlife Services target numbers to maintain viable eastern and western populations (80,000 and 60,000 respectively). The western population, for example, has increased at a rate of 7 percent since 1989. Over the last 10 years the eastern population has remained stable – about 29,000 above the target population size (Mullie et al. 1996, CWS Committee 1999). Shooting is considered the most significant post-fledging mortality factor; but it is also of concern that unregulated hunting accounts for more deaths than regulated hunting (Limpert and Earnst 1994).

Because their long necks permit feeding in water up to one metre, swans may bottom feed over a wide area of marshland. Lead poisoning is recognized as a threat; however, most lead poisoning events do not involve large numbers of these birds (ibid.).

4.2.1.2 Greater Scaup *Aythya marila*

Greater Scaup and Lesser Scaup are freshwater diving ducks, closely related to Ring-necked Duck (*Aythya collaris*), Canvasback (*Aythya valisineria*), and Redhead (*Aythya americana*). Combined, the scaup are the most widespread diving ducks in North America – their breeding population is larger than any of the other diving ducks and most of the dabbling ducks (Austin et al. 1999). Referred to by hunters as “bluebills,” the two species cannot be easily distinguished from one another during aerial surveys. They are often considered together by waterfowl biologists, resulting in species-specific management problems. Experienced birdwatchers familiar with scaup use several somewhat subtle morphological differences to distinguish between them (Kaufman

1990).

Distribution and Abundance

Greater Scaup breed across the north from Alaska through Central Canada to specific eastern regions including western Quebec and eastern Newfoundland. In Eurasia the Greater Scaup breeds from Iceland across northern Scandinavia, Russia, and Siberia. In winter this species gathers along coastal waters of North America and northwestern Europe and seas along the coasts of Japan and China. Significant numbers gather inland, along the lower Great Lakes, for example, and in some localities of central Europe and western Asia (del Hoyo 1992).

Population Trends

Breeding populations of scaup have fluctuated markedly since 1955 according to the Waterfowl Breeding Ground Population and Habitat Survey. Since the mid-1980s, there has been a steady decline in numbers of about 150,000 scaup per year (Austin et al. 1999). In 1998 less than 3.5 million breeding scaup were counted – the lowest number ever recorded (Anderson 1999). This number was 36 percent below the long-term average for breeding scaup and 44 percent below the North American Waterfowl Management Plan's goal for these species. During the 1990s, while populations of many common North American ducks remained stable or increased, scaup significantly declined. In fact, midwinter counts have shown a steady decline throughout North America; however, by far the steepest decline has been in the Mississippi Flyway (ibid.). Surveys demonstrate that this decline has not been the result of hunting (Austin et al. 1999). The most disturbing information from hunter-killed birds is that the proportion of young birds in the annual harvest has gradually declined since the 1960s. This decline is again most noticeable in the Mississippi Flyway. As well, the proportion of males to females has been increasing. Both trends – decline in young birds and females – suggest declining reproductive success. In 1998, a Scaup Workshop brought scaup biologists from Canada and the United States together to discuss the



decline in scaup populations and to initiate research to understand and prevent further declines (Austin et al. 1999). Adding confusion to this concern, observations during migration through the

Greater Scaup on the Lower Great Lakes

The concern over the decline of the Greater Scaup population (Austin et al. 1999) has prompted research into the ecology of this waterfowl throughout its range. Of particular concern on the lower Great Lakes is the correlation between increasing wintering flocks of scaup and the population explosion of zebra mussels. Observations on western Lake Erie, for example, indicate that scaup migration has shifted to this area and stopovers are longer since the zebra mussel invasion (Wormington and Leach 1992). The non-native mussel was introduced into the Great Lakes system in 1986 by the dumping of ships' ballast water into Lake St. Clair. Within a few years, in Lakes St. Clair and Erie, the population density of this mussel (100,000/m²) far exceeded the densities of native bivalves (10/m²) (Petrie 1999). The Zebra mussel is a filter feeder, capable of filtering a litre of water per day and removing from it most single-celled organisms that live suspended in a lake (Wittman 1999). Because of their high body fat content and ability to filter large quantities of water, zebra mussels concentrate 10 times as much toxins, including PCBs, in their fatty tissues as do native mussels (ibid.). Organisms high in the food chain that feed on zebra mussels, including waterfowl such as scaup, will accumulate these toxins in their body fat. Studies of Tufted Duck, a related species living in Europe, show that reproductive success dropped 60 percent when fed contaminated zebra mussels (Petrie 1999). Several research programs are currently underway in various regions, including Ontario (e.g., Long Point Waterfowl and Wetlands Research Fund and the University of Western Ontario) to examine the impact of contaminated mussels on Greater Scaup reproduction. As well, several aspects of the stopover ecology of both Greater and Lesser Scaup are underway at Long Point under Dr. Scott Petrie (ibid.).

lower Great Lakes show significant increase in numbers of scaup (Austin et al. 1999, Petrie 1999, Wormington and Leach 1992), likely owing to the proliferation of zebra mussels as a food item (Petrie, pers comm.).

Natural History

The natural history of Greater Scaup is briefly summarized by del Hoyo (1992), and Ehrlich et al. (1988). This species breeds throughout the prairies and western boreal forest on small, shallow lakes, and the western sub-Arctic adjacent to tundra pools. Nests, often clustered on small islands to avoid predation (Benoit and Rail 1996), take the appearance of loose colonies. Breeding predominantly in Alaska and northwestern Canada, Greater Scaup migrate across the boreal forest region of the country to winter on the Atlantic and Gulf Coasts of the United States or on the Great Lakes, particularly Lakes Ontario and Erie (ibid.). Estimated wintering numbers indicate that about 60 percent of the Greater Scaup winter on the Atlantic, 20 percent on the Pacific, and 20 percent in the interior, including the Great Lakes (Bellrose 1976). Along the coast, Greater Scaup favour the shallow waters of lagoons, estuaries, and sheltered bays. Inland, they select the larger lakes. Adult males tend to

remain further north than either females or immatures (del Hoyo 1992). Del Hoyo suggests that the tendency of Greater Scaup to concentrate in large numbers near sewage outlets in winter, particularly along maritime coasts, puts them at risk from pollution, perhaps more so than other ducks. Vulnerability to oil spills (Benoit and Rail 1996) and toxins that accumulate in zebra mussels is a concern (Petrie, pers comm.).

Greater Scaup prefer to forage in shallow water less than 1.5 m deep (ibid.). They feed on animal and plant matter, consuming molluscs, insects, crustaceans, worms, small fish, tadpoles, fish roe, and seeds. Studies indicate that molluscs make up over 80 percent of their diet and that zebra mussels in particular are a favorite food item (Petrie, pers comm. 2000, Bellrose 1976, del Hoyo 1992), although in some areas they prefer feeding on aquatic plants (Bellrose 1976).

4.2.1.3 Other Ducks

The most common dabbling ducks in the Greater Rondeau Area IBA are the Mallard (*Anas platyrhynchos*), American Black Duck (*Anas rubripes*), and American Wigeon (*Anas americana*). Together they comprise more than 90 percent of dabblers recorded during aerial surveys of Rondeau marshes (Mullie et al. 1996). The numbers of American Black Ducks have declined from as many as 6,000 in 1970 (Woodliffe, pers comm.). The number of waterfowl-days seasons (a waterfowl-day equals the number of ducks multiplied by the number of days ducks are present) for dabblers fluctuates significantly year to year and even between migration. During spring and fall, small numbers of Northern Pintail (*Anas acuta*), Gadwall (*Anas strepera*), Green-winged Teal (*Anas crecca*), and Blue-winged Teal (*Anas discors*), Northern Shoveler (*Anas clypeata*), and Wood Duck (*Aix sponsa*) are recorded. A legally baited area operated in the 1970s, together with waste corn in adjacent agricultural fields, assisted in holding dabbling ducks in the area during the fall (Boyd 1974). The baited area was discontinued by 1991 (Mullie et al. 1996).

According to Mullie et al. (1996), diving ducks, including mergansers, utilize Rondeau Bay as a stopover area during both spring and fall migrations. Mergansers, primarily Common (*Mergus merganser*) and Red-breasted (*Mergus serrator*), use the area more in spring than fall. During fall migration, scaup and Canvasback make up more than 80 percent of bay ducks; however, the number of waterfowl-days from 1973 to 1993 dropped because of the decline in scaup and Canvasback populations. The number of waterfowl-days in spring dropped slightly from 1973 to 1980, then peaked in 1992, again because of increases in numbers of scaup and Canvasback. Also, during spring, the proportion of scaup and Canvasback to the other diving ducks in Rondeau Bay ranged from 45 percent to 73 percent. Redheads made up a larger proportion with Ring-necked Duck and Ruddy Duck (*Oxyura jamaicensis*) making up less than 1 percent to as high as 20 percent.

4.2.2 Shorebirds

Termed the “wind birds,” shorebirds such as IBA species Black-bellied Plover, American Golden-Plover, and Whimbrel travel an annual circuit of several thousands of kilometres. Travelling hemispheric distances, particularly on transoceanic flights, requires stopover areas to permit rest and refueling as the birds build up pre-migratory fat before the next long flight begins. A number of key stopover areas make such long-distance migration possible (Western Hemisphere Shorebird Reserve Network 1998). The study of shorebird migration has given rise to the study of “stopover ecology,” the study of how links in the migratory chain work.

The shorelines of the Great Lakes provide important stopover sites. In spring, shorebirds arriving from the coastal United States, southeast and gulf coastlines gain a respite before undertaking the next leg of their journey to the coastlines of James and Hudson Bays or to their sub-Arctic and Arctic breeding grounds.

Shorebirds are birds of the land and water interface – the flat expanses of mud, beach, and estuary-like mouths of marshes, heaths, and meadows along coastal shorelines. As well, sewage lagoons and agricultural fields in the spring, and drawn-down reservoirs in the fall offer appropriate stopover

habitat for many species of shorebirds during migration.

Greater Rondeau Area IBA serves as a stopover area, particularly in the spring, for as many as 25 species of shorebirds. The agricultural coastal shoreline, black loamy fields, marshes, pond edges, and sand beaches of this IBA provide areas for foraging, resting, and feather preening. In addition to the species described below, large numbers of Ruddy Turnstone and good numbers of several other species are regularly recorded at Rondeau during both the spring and fall migrations.

4.2.2.1 Black-bellied Plover *Pluvialis squatarola*

In breeding plumage, the Black-bellied Plover is one of the most strikingly beautiful of all shorebirds. The intense black of its underparts from face to upper belly is separated from its silvery spangled and blackish-grey upper body by a broad band of pure white plumage. It may be recognized by its bold outline almost as far as it can be seen. In early to mid-May, as this plover stands hunched and motionless on an agricultural field adjacent to Rondeau Bay, its mournful fluting whistle of “*pee-ooo-lu*” betrays its presence. A search of the field soon turns up the bird – perhaps several, perhaps 100. In spring, peak numbers of Black-bellied Plover can approach the thousands in Greater Rondeau Area IBA (Canadian IBA Database 1999).

Often dispersed within the loose flocks of feeding Black-bellied Plovers are American Golden-Plovers, similarly patterned but not as large or as stout and having completely black underbellies and undertail coverts. Paulson (1995) summarizes the natural history of Black-bellied Plover.

Distribution and Abundance

Black-bellied Plovers winter south through the West Indies to the coastline of Chile and northern Argentina. Of the 50,000+ birds breeding in North America, about 55 percent winter in South America (del Hoyo 1996b), the remaining dispersed along the Atlantic and Pacific coastlines of Mexico, the United States, and as far north as southern British Columbia. These strong flyers appear equally at home on the wide-open spaces of the agricultural flats of this IBA as on the vast coastal mudflats of the Americas.

Migration

On their spring migration, Black-bellied Plovers arrive overnight, stopping to refuel, feeding primarily on earthworms before continuing their northward migration. Their length of stay at a stopover is inversely related to the fat content of their bodies. The higher the fat content, the shorter the stay, although the availability of food, competition from other shorebirds, and weather may also have an effect (Western Hemisphere Reserve Shorebird Network 1998).

The Black-bellied Plover arrives on the breeding grounds in late May or the first half of June, weather permitting. It nests on the tundra north of the tree line throughout Arctic regions of Canada, Alaska, Siberia, and Russia (Richards 1988). Adults leave the breeding grounds in late July to September while birds hatched that year head south five to six weeks later. The southward movement continues into November and, as in the spring, occurs over a broad front although the

route tends to be further to the east.

Much effort in recent decades has resulted in the location and conservation of stopover sites for all species of shorebirds (Weidensaul 1999). Shorebird biologists are well aware that stopover sites underpin the entire migration system of these birds. For long-distant migrants such as the Black-bellied Plover, stopping over for refuelling and rest is critical to reproductive success. Shorebirds cannot afford to arrive on their breeding grounds in late May or even mid-June in poor condition. The unpredictable nature of Arctic weather could wipe out an entire migrant flock or an entire breeding season. With peak numbers of Black-bellied Plovers approaching thousands in the spring, the Rondeau Bay site is obviously an important link in the chain of transcontinental stopovers for this species.

4.2.2.2 American Golden-Plover *Pluvialis dominica*

This species is very similar to the Black-bellied Plover, often occurring in mixed flocks in agricultural fields. The American Golden-Plover is slightly smaller with a finer bill, and lacks the whitish rump, wing stripe, and black “armpits” of the Black-bellied Plover in all plumages. In breeding plumage the American Golden-Plover has much darker upperparts, with golden edging to the dark-centred feathers on its crown, back, secondary, and tertiary feathers. This species can be seen in agricultural fields in parts of the IBA during its brief spring migratory stopover in early to mid May. Often its whistled “*que-del*” call announces its presence. Johnson and Connors summarize the natural history the American Golden-Plover (1996).

Distribution and Abundance

The American Golden Plover breeds on sub-Arctic and Arctic tundra from Baffin Island to the Seward peninsula of Alaska, and from Devon Island south to Cape Henrietta Maria on Hudson Bay. The winter range of this species is primarily grasslands and coastal and inland wetlands and farmlands from southern Brazil to Argentina (Johnson and Connors, 1996). Morrison et al. (2001) estimate the global (and North American) population of American Golden-Plover at 150,000.

Migration

Weidensaul (1999) describes the spectacular elliptical migration of this species. The flight from breeding to wintering grounds takes this species first east across the Canadian Arctic, then south to the Maritimes before the birds leave the continent to make landfall in South America. Some adults apparently fly the 8,000 kilometres from breeding to wintering grounds non-stop (Johnson and Connors 1996). Adults depart shortly after breeding, whereas juveniles leave in late summer or fall. The return flight begins in late January or February, following the mid-continent over the upper reaches of the Amazon, and likely for most birds, involving a non-stop flight over the Caribbean and Gulf of Mexico. American Golden Plovers arrive in Texas, Louisiana, and Florida in late February to early March (ibid.). Birds reach extreme southern Ontario by early to mid-April. In some years, a few arrive as early as late March. Woodliffe’s peak observation of 3,000 birds in the Rondeau area was recorded on April 18, 1976 (Woodliffe, pers comm.). At Point Pelee, mid-April to mid-May is given as the peak time for observing this species (Point Pelee National Park 1981). Spring records in

Ontario are concentrated in southwestern Ontario, particularly in the western Lake Erie basin and Lake St. Clair. Birds are typically observed in dyked farm fields with black soils where vegetable crops such as onions, beets and tomatoes are grown. When the lake level is low, this species may use the shoreline extensively for feeding and resting.

Natural History and Conservation Issues

These plovers feed on a range of items including invertebrates such as earthworms, insects, spiders, and crustaceans as well as berries, and seeds (Johnson and Connors 1996). Natural predators include Peregrine Falcons, Gyrfalcons, jaegers, gulls, Common Ravens, foxes, and weasels on the birds' breeding grounds.

Johnson and Connors (1996) list conservation and management issues that have affected this species. These include:

- market hunting in the nineteenth and early twentieth centuries
- loss of habitat to agriculture, ranching, reclamation, pollution, and human growth
- pesticide exposure
- collisions with aircraft

Since 1918, the American Golden Plover has been protected in North America by the Migratory Bird Treaty Act.

In the Rondeau Bay IBA both American Golden-Plovers and Black-bellied Plovers feed in agricultural fields before continuing their flight towards their breeding grounds. The quality of invertebrate life available to these birds depends on the soil quality. Farming practices that minimize pesticide use and reduce or eliminate the need for tillage benefit both species.

4.2.2.3 Whimbrel *Numenius phaeopus*

The Whimbrel is one of the largest and most impressive shorebirds observed on the Great Lakes. Its long, down-curved bill and mostly brown plumage distinguish it from other shorebirds migrating annually through the Great Lakes region. Skeel and Mallory (1996) summarize the natural history of the Whimbrel.

Distribution and Abundance

Experienced Ontario birdwatchers can predict with confidence where and when to observe the spring arrival of migrating Whimbrel in the province. Within a few days of May 24, flocks of up to 3,000 Whimbrel arrive and move along the shorelines of Lake Ontario and Lake Erie (Goodwin 1995), alighting for a few hours or a few days of rest and feeding. From here they continue north to the coast of James Bay and subsequently to the tundra and taiga breeding grounds of the Hudson Bay coastlines of Ontario, Manitoba, and Nunavut – in the latter instance, breeding well into the interior (Skeel and Mallory 1996).

Those arriving on May 24 in Ontario are migrating from the Gulf and Atlantic coastlines north to New Jersey, where they stop over during mid-April to mid-May. Prior to that, these Whimbrel were wintering along coastlines from southeastern United States to South America, concentrating in numbers along the coastlines of Suriname and north-central Brazil (ibid.). This eastern population of Whimbrel is one of two populations residing in the Americas. A western population of Whimbrel breeds in Alaska and coastal Yukon. These birds winter along the Pacific coastline from California to Chile (ibid.). No estimate of the size of these populations breeding in remote regions of the continent is available; however, the estimated number of Whimbrel wintering in the Americas ranges from 25,000 to 100,000 (del Hoyo 1996c). Other distinct populations of Whimbrel also occur in Eurasia, breeding in Iceland, Scandinavia, and Russia and sporadically across northern Siberia (ibid.). Eurasian populations winter along coastal Africa and the Indian Ocean to Australasia.

Natural History

Typical of tundra-breeding shorebirds, the length of stay on the breeding grounds is brief. Nesting begins in early June, with peak hatching at the end of the month into the first week of July. By mid-July, nesting females leave their mates and young (Skeel and Mallory 1996). Within a few weeks all have left the breeding grounds, the juveniles being last to leave. Whereas spring migration is short-lived, fall migration is prolonged, lasting two or three months. By the last two weeks of August, Whimbrels of the eastern population have moved eastward along the Hudson and James Bay coastlines, across the Ungava region of northern Quebec to the Atlantic coast. Throughout the summer months of July and August, large numbers of Whimbrel stop over along coastal Labrador, Newfoundland, the Gulf of St. Lawrence, and south to New England. Some are recorded along the Great Lakes. Along these coastlines Whimbrels build up stores of pre-migratory fat, preparing for a transoceanic flight over the Atlantic to the Caribbean and South America.

Studies in coastal regions of Panama demonstrate that the length and sickle shape of the Whimbrel's bill match the burrow curve of the Fiddler Crab (Skeel and Mallory 1996). Yet the apparent adaptiveness of the bill does not dictate that the bird has a diet restricted to this crab. Rather, the Whimbrel has a varied diet, feeding not only on a variety of invertebrates, both aquatic and terrestrial, but also on a variety of berries on the breeding grounds. Aquatic invertebrates make up a significant portion of the diet in spring, while during fall migration, Whimbrel feed heavily prior to the ripened berry crop, building fat reserves for the long flight south (Bent 1962, Skeel and Mallory 1996).

Having a varied diet suggests that food would be continuously available to the Whimbrel. However, coastline regions of the Americas are heavily utilized and modified by humans, often eliminating or minimizing coastal feeding habitat for shorebirds. Stopovers in spring along Lake Erie on the beaches and agricultural fields of Greater Rondeau Area IBA last only a few days – too brief to seem significant or useful or to require protection. For long-distance migrants such as Whimbrel that hopscotch from Suriname to the Carolinas to Rondeau and James Bay to Nunavut, these brief but vital stopovers make the links from wintering ground to breeding ground possible.

5.0 Other Elements of High Conservation Value

A great variety of habitats within the Greater Rondeau IBA contribute to bird species diversity of both national and provincial significance. Habitats include Carolinian forest with significant southern affinities, savanna, beach dune communities, extensive marshes, swamp, and shorelines, as well as the open waters of Rondeau Bay and the nearshore waters of Lake Erie. Over 335 bird species have been recorded on the Rondeau Provincial Park checklist. During the 1981-85 Ontario Breeding Bird Atlas program, the atlas square containing the highest number of species with evidence of breeding in the province (Woodliffe 1996) was located in what is now this IBA. Similarly, the annual Christmas Bird Count, which includes the IBA, regularly records one of the highest species totals for the province. As well as a number of species fulfilling IBA criteria, several rare species, including Bald Eagle (*Haliaeetus leucocephalus*), an Endangered species in Ontario, nest in the IBA. Both Louisiana Waterthrush (*Seiurus motacilla*) and Yellow-breasted Chat (*Icteria virens*) have recently bred within the IBA, but neither species has been recorded as breeding in the last two years (Dobbyn, pers comm.). Both are considered species of Special Concern nationally and Vulnerable in this province. Other notable species breeding or suspected of breeding within the IBA have included Chuck-will's-widow (*Caprimulgus carolinensis*), Tufted Titmouse (*Parus bicolor*), Carolina Wren (*Thryothorus ludovicianus*), Northern Mockingbird (*Mimus polyglottos*), and White-eyed Vireo (*Vireo griseus*), all of which attest to the "Carolinian" affinities of this IBA (Goodwin 1995, Wake 1997, Woodliffe 1996).

The wetlands of the IBA are particularly significant to the Municipality of Chatham-Kent. Of the 117 bird species that are rare or uncommon in Chatham-Kent, 54 (46 percent) are dependent directly or indirectly upon wetlands (ibid.). Fifteen species of ducks, numbering 12,000 to 15,000 individuals annually, may be found within one square kilometre of marshland (Woodliffe 1994). Over 8,000 Canada Geese (*Branta canadensis*) have been recorded during migration (ibid.). Marshbirds of note include Great Egret (*Casmerodius albus*), Black-crowned Night-Heron (*Nycticorax nycticorax*), Common Moorhen (*Gallinula chloropus*), and American Coot (*Fulica americana*). Terns, including Common Tern (*Sterna hirundo*) and Black Tern (*Chlidonias niger*), have nested at McGeachy's Pond in the western portion of the IBA near Erieau (Canadian IBA Database 1999). Black Terns frequently nest in small colonies in the Rondeau Provincial Park marshes (Dobbyn, pers comm., 2001).

A large number of songbirds use Rondeau as a staging area during migration. The nearby onion fields attract both migrating terns and shorebirds during spring migration (ibid.).

Of the 108 species of birds of conservation concern occurring in Chatham-Kent, all occur within the Greater Rondeau Area IBA. Of 13 species designated Endangered or Threatened in Ontario, all but two have been known to breed in this IBA (Bird Studies Canada 2000, Rondeau Provincial Park Checklist of Birds 1984).

Thirty-three species of mammals occur within the IBA. Of these, Gray Fox (*Urocyon cinereoargenteus*), a Species of Concern in Canada, has been recorded (Wake 1997), and Southern Flying Squirrel (*Glaucomys volans*), considered rare in Ontario, breeds in this IBA (Dobbyn 1994). Several of the 30 species of amphibians and reptiles are significant. Five-lined Skink (*Eumeces fasciatus*), Eastern Hognose Snake (*Heterodon platirhinos*), and Spotted Turtle (*Clemmys guttata*) are Species of Concern nationally and Vulnerable provincially. Fowler's Toad (*Bufo woodhousii fowleri*), Eastern Fox Snake (*Elaphe vulpina gloydi*), and Eastern Spiny Softshell Turtle (*Apalone*

[Trionyx] spinifera spinifera) are Threatened both nationally and provincially. Of the 66 species of fish in the IBA, the Lake Chubsucker (*Erimyzon sucetta*), Spotted Gar (*Lepisosteus oculatus*), Eastern Sand Darter (*Ammocrypta [Etheostoma] pellucida*), Black Redhorse (*Moxostoma duquesnei*), Channel Darter (*Percina copelandi*), Warmouth (*Lepomis gulosus*), Pugnose Shiner (*Notropis anogenus*), and Silver Chub (*Macrhybopsis [Hybopsis] storeriana*) are designated by the Committee on the Status of Endangered Wildlife in Canada as Species of Concern and by the Ontario Ministry of Natural Resources as Threatened.

At least 837 species of plants have been recorded in Rondeau Provincial Park, of which almost 100 are considered rare in Ontario or Canada (Woodliffe 1994, 1997). The larger of two known Canadian populations of Nodding Pogonia (*Triphora trianthophora*), Endangered in Canada and perhaps the only extant population, occurs in Rondeau. This is one of 19 species of orchids in Rondeau Provincial Park (Wake 1997, Woodliffe 1994). Other significant plants include Swamp Rose Mallow (*Hibiscus moscheutos*), a Species of Concern in Canada; Riddell's Goldenrod (*Solidago riddellii*), Vulnerable in Ontario; and nationally Endangered Red Mulberry (*Morus rubra*). Forming the canopy and understorey of the Carolinian forest are numerous species of trees and shrubs such as Tulip-tree (*Liriodendron tulipifera*) and Sassafras (*Sassafras albidum*).

Finally, the IBA has provincially and nationally significant landscapes. As previously described, the cusped foreland is a very unusual geomorphological feature. Together with its fairly contiguous Carolinian forest, it represents a vegetation-landform feature not represented elsewhere in Canada (Ontario Ministry of Natural Resources 1991).

6.0 Ownership and Use

6.1 Land Ownership

The core area of the IBA, Rondeau Provincial Park, comprises 3,298 hectares administered by Ontario Parks. The portion of Rondeau Bay outside of the park boundary, approximately 1,640 hectares, is also administered by the Ontario Ministry of Natural Resources under the Ontario Public Lands Act (Ontario Ministry of Natural Resources 1991). Within the park is a cottage community of 296 private leaseholds as of 2000 (ibid.). Approximately 3,200 hectares on the mainland, adjacent to Rondeau Bay and extending east from Morpeth Cliffs to Erie Beach on the west, are predominantly agricultural lands in private ownership. Bates Marsh is privately owned. McGeachy's Pond Management Area is a 15 hectare property owned by the Lower Thames River Conservation Authority (LTVCA). LTVCA owns and manages 20 hectares of Rondeau Bay Marshes southwest of Shrewsbury.

6.2 Land Use

Historical

The marshes and the bay of the Greater Rondeau Area IBA provided fishing and hunting opportunities for aboriginal peoples. For early French explorers, the peninsula was a recognizable landmark, Point aux Pins. In 1670, the missionary-explorers Casson and Galinee camped here and wrote about a fine, “round water” harbour, Ronde Eau. By 1790, lands in this region had been acquired by the British, and the military potential of Rondeau Bay as a naval base was soon recognized. In 1795, Lieutenant-Governor John Simcoe declared the peninsula “Ordinance Land” under the control of the British Crown – no settlement was permitted. The harbour became a naval repair yard. North of the peninsula the mainland forests were cleared and farm lots established by settlers brought into the territory by Colonel Thomas Talbot.

Even without Simcoe’s declaration, it is doubtful that the settlement of the peninsula would have proceeded, for the soil was too shallow and sandy for agriculture. Nevertheless, the forests, marshes, and open water of the bay were a source of resources for settlers in the region: timber, waterfowl, fish, furs, maple syrup, and bog iron (Ontario Ministry of Natural Resources 1992). By 1880 the first commercial fisheries had been established. From the village of Erieau, a fleet of up to 30 commercial fishing boats operated into the year 2000 with total weight of catch at 890,000 kilograms, valued at \$3,367,567 (Prangley, pers comm., 2001).

In the 1890s several hotels and boarding houses had been established, as local businessmen began to appreciate the potential of the area for tourists. Cottages were built along the lakeshore of what is now Rondeau Provincial Park as early as the 1890s. At the peak there were more than 500 cottages (ibid.). Recognizing that the peninsula was not appropriate as farmland but that it potentially could increase the tourist opportunities in the region, local businessmen lobbied the provincial government to establish a provincial park. In 1894, Rondeau Provincial Park was established – the second in Ontario.

Significant change has occurred in the waters of Rondeau Bay. During the 1900s, local agricultural production increased, and conventional tillage practices resulted in severe erosion. Both soil and agricultural chemicals entered the creeks and streams flowing into the bay and the water quality became degraded. To eliminate navigational problems caused by the highly invasive Eurasian milfoil, herbicides were applied in the 1950s and 1960s to the waters of the bay, and weed cutters were used to cut channels through the extensive weed beds. Eurasian milfoil has a tendency to die off quickly, and this, together with record high water levels and severe erosion and siltation from surrounding agricultural fields, contributed to the sudden disappearance of most of the aquatic vegetation. As a result, water quality of the Bay deteriorated to very serious levels by the late 1970s and early 1980s.

Current

Rondeau Provincial Park offers the public a wide range of activities, including boating, camping (260 campsites), cycling, fishing, hiking, picnicking, and waterfowl hunting. With several kilometres of beaches, swimming and other water activities such as windsurfing are popular.

Opportunities for nature viewing, birdwatching, and nature photography are outstanding. Enhancing these opportunities are five nature trails totalling about 20 kilometres. Activities such as guided nature hikes and outdoor education outings are offered year-round, although primarily in summer. Displays in the Visitor Centre showcase the park's natural and human history. In winter, hiking and cross-country skiing are permitted on roads and trails. Ice fishing and snowmobiling are permitted on the bay. Commercial services are available at the Bay Side Centre, which acts as a food outlet and a social centre for park visitors.

At one point, the park boundary included the entire bay as well as the peninsula. Since 1984, only the peninsula and the eastern portion of the bay are included within the park (fig. 1), reducing its area from 4,897 hectares to 3,254 hectares. Along the northern shoreline of Rondeau Bay, the once extensive marshlands have been reduced to a narrow strip that contains less than 5 percent of the area's former wetland habitat (McKay 2000). On nearby agricultural lands, fencerows and forests have been removed to increase agricultural production. Between Erie Beach and Erieau, a dyke separates an established cottage development along the lakeshore from many hectares of fertile agricultural land. In fact, the dyke serves as an access road to the cottages – Erie Shores Drive. During periods of high water levels, the dyke may be breached, threatening both the cottages and the agricultural lands (Chatham-Kent Community Strategic Plan 1999).

7.0 Conservation Management Achieved at the IBA Site

7.1 Rondeau Provincial Park

The World Conservation Union (IUCN) promotes a common approach to the world's environmental pressures and serves as a global advocate for the environment (IUCN 2000). It is a world partnership of governments, their agencies, and private organizations working to conserve the integrity and diversity of nature. One of their initiatives is to classify the different kinds of protected areas. Rondeau Provincial Park is designated an IUCN, Category #2 Protected Area, to protect outstanding natural and scenic areas of national or international significance for scientific, educational, and recreational use. Parks in this category are relatively large and not naturally altered by human activity; extractive resources such as mines and quarries are not permitted.

All parks in the Ontario Parks system are categorized into one of six categories. These categories reflect the types of permitted activities and the level of protection that is provided for the natural features of each park. For example, parks with more sensitive and significant natural features are categorized as Nature Reserves or Natural Environment Parks in order to protect those resources, while parks that were formed for their recreational values are categorized as Recreational Parks. Rondeau Provincial Park is categorized a Natural Environment Park. A Natural Environment Park “incorporates outstanding recreational landscapes with representative natural features and historical resources to provide high quality recreational and educational experiences” (Ontario Parks: Building a Park System 1996). Parks in this category serve to protect significant ecological values, while providing quality recreational opportunities compatible with the protection mandate.

In order to ensure that the protection mandate of Rondeau is achieved, while still providing quality outdoor recreational opportunities, the park was divided into four different zones, each having a set of management guidelines and approved activities (Rondeau Provincial Park Management Plan).

Access Zones: 308 hectares. These zones serve as public or service vehicle travel routes and provide visitor access to the significant natural environment of the park. This zone includes the roads and a 30-metre strip on both sides.

Development Zones: 398 hectares. Development zones provide for facilities and services for a range of day use and camping activities. Within such zones, all maintenance and development activities will be carried out with special care for the environment. Land use activities in this zone include all day use, camping, and cottage activities.

Natural Environment Zone: 1,432 hectares. This zone is extensive in area and includes most of the marsh and bay that is within the park boundary. It is managed for recreational access, but with an emphasis on protecting the wildlife and wildlife habitat found within the zone. Fishing and waterfowl hunting are permitted in this zone.

Nature Reserve: 1,116 hectares. This zone is designated to provide long-term stewardship and protection of the natural and least disturbed areas of Rondeau's Carolinian forest and wetland environments, including a significant portion of the marsh. Recreational activities are not permitted in this zone.

The Natural Environment Zone and Nature Reserve zones together provide for the protection of over 2,500 hectares of the park and significant habitat for IBA species. Both are designated to provide long-term stewardship of the marsh.

The negative effects of high numbers of deer within Natural Environment Parks are well documented (Koh 1991, OMNR 1991, Voigt and Smith 1993, Bakowsky 1995, Koh et al. 1996, and others). Deer numbers have fluctuated in Rondeau since the early 1900s. Periodic culls were undertaken to reduce deer numbers up until 1973. However, during that time, culls were conducted only when deer numbers were deemed to be excessive, and thus a dramatic fluctuation in numbers resulted, with periods of high deer numbers and periods of lower numbers. In 1973, culls were discontinued due to public opposition to deer reductions in provincial parks. Between 1973 and 1991, deer numbers climbed substantially, reaching a peak of approximately 600 animals in the park. This number reflects almost ten times the carrying capacity of the ecosystem. It is felt that a population level of six to seven deer per square kilometre is the maximum number the landscape can accommodate without negatively impacting on other wildlife and on vegetation.

In 1993, soon after the completion of the Park Management Plan that identified the need to re-establish active deer management, 322 deer were removed from the park. Subsequent deer herd reductions were made in 1998, 1999, and 2000, effectively lowering the deer herd within the park. The annual deer count in January 2001 found approximately 87 deer in the park. Although this number is close to the target population of 65-75 deer for the park, recruitment will bring that number back up to approximately 110 individuals by mid-summer. This emphasizes the need for ongoing deer management and regular deer herd reductions to ensure that the population is brought

down and kept at a level that can be supported by the environment. Some biologists feel that the number should be brought below normal carrying capacity, since the carrying capacity reflects what the landscape should be able to support when the environment is in a healthy state. The vegetation community in Rondeau has been severely affected by a prolonged period of over-browsing, and bringing numbers below the long-term carrying capacity for a few years would help the vegetation communities to recover.

Both commercial fishing and bait fishing are permitted within the nearshore waters of Lake Erie within the park boundary; however, no commercial fishing is permitted in Rondeau Bay. Bait fishing is permitted. Recreational fishing is a major tourist industry in the area and is encouraged.

Numerous opportunities for scientific research exist within Rondeau Provincial Park (OMNR 1991). Research includes studies on rare, threatened, or endangered species including a number of bird, plant, and herptile species. The park actively participates in the Marsh Monitoring Program, Forest Bird Monitoring Program, Christmas Bird Counts, white-tailed deer population management, and studies on the response of vegetation to deer management. These projects are done by park staff and university researchers and through cooperative arrangements with volunteers and outside contractors. Many of these studies have implications for the establishment and/or maintenance of healthy populations of IBA bird species.

Vegetation management within the park has consequences for IBA bird species. Management includes removal of non-native plants, prescribed burning in oak woodland and oak savannas, planting of indigenous species in development zones, and protection of rare and endangered species. No logging is permitted in the park. Natural succession is allowed to occur in most instances except for the maintenance of tallgrass prairie and savanna communities, where prescribed burns are being used or considered, to protect these globally rare communities.

All cottage leases in the park are currently valid until December 31, 2017. Ontario Parks has and will continue to acquire cottages, subject to availability of funds, as they come on the open market. Passive and active regeneration methods are employed to rehabilitate cottage lots as the cottages are removed.

7.2 Rondeau Bay Marshes and Watershed

Rondeau Bay marshes are Provincially Significant Wetlands and are part of a securement project under the Great Lakes Wetlands Conservation Action Plan (GLWCAP), as well as being a Creation and Rehabilitation Project with 22 hectares in progress (Wetland Habitat Creation and Rehabilitation Project 1998). A significant wetland is an area identified as being provincially significant by the OMNR, using evaluation procedures established by the province, as amended from time to time (Provincial Policy Statement definition). Rondeau Bay has been identified as a priority site under the GLWCAP for restoration work. The Great Lakes Cleanup Fund has provided some funding to initiate remedial action plans for fish and wildlife habitat of the Rondeau Bay watershed.

Lying within or near the Rondeau Bay watershed, and hence adjacent to Rondeau IBA, are two Life Science Areas of Natural and Scientific Interest (ANSI), Sinclair's Bush and Clear Creek. Life Science ANSIs represent the most significant and representative examples of the natural heritage features in the province. Such features have life science values related to protection, scientific study, or education. ANSIs play an important role in the protection of Ontario's natural heritage. Clear Creek has also been designated an IBA for its breeding populations of Acadian Flycatcher and Red-headed Woodpecker. As well, there are 20 bird species considered to be Priority Species for the Municipality of Chatham-Kent (McKay 2000).

Areas within the Greater Rondeau Area IBA but outside of the park fall under the Chatham-Kent Community Strategic Plan (1999), an umbrella strategy that includes protection of the natural heritage and natural resources of the municipality. Within the IBA, the hamlet of Shrewsbury lies adjacent to and within the Provincially Significant Wetland area along the north shore of Rondeau Bay. Interim control provisions have been placed on the hamlet that prohibit further development, pending an environmental study to delineate the wetland and to examine potential impacts that future development may have on these wetlands (Chatham-Kent Community Strategic Plan 1999). The remnant marshes and wet fields remaining along the shoreline may provide habitat for King Rail and other marsh species (Goodwin 1995).

8.0 Stakeholder Activity

Canadian Wildlife Service (CWS)

CWS is responsible for enforcement of the Migratory Bird Convention Act, as well as regulation of federal Species At Risk. All of the significant species of the Rondeau Bay IBA are included under the Migratory Bird Convention Act, and several are listed as national Species At Risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). CWS funds and supports the development of recovery plans for Species at Risk, along with provincial counterparts. CWS conducts waterfowl surveys of the Great Lakes shoreline in both fall and spring, to monitor waterfowl numbers, through agreements under the North American Waterfowl Management Plan.

The CWS webpage is: http://www.on.ec.gc.ca/wildlife_e.html

Ontario Parks (OMNR)

Through Ontario Parks, the ministry plans, manages, and operates the provincial parks system. Ontario Parks' Mission is simply "Protect and Enjoy." Ontario Parks assists the province to establish new parks and encourages responsible use of lands adjacent to parks. Ontario Parks is governed by the Ontario Provincial Parks Act, the Ontario Provincial Parks Policy, and Ontario Provincial Parks: Planning and Management Policies. Ontario Parks goal is "To ensure that Ontario's provincial parks protect significant natural, cultural, and recreational environments, while providing ample opportunities for visitors to participate in recreational activities. Objectives include:

- Protection: To protect provincially significant elements of the natural and cultural landscape of Ontario.

- Recreation: To provide outdoor recreation opportunities ranging from high-intensity day use to low-intensity wilderness experiences.
- Heritage appreciation: To provide opportunities for exploration and appreciation of the outdoor natural and cultural heritage of Ontario.
- Tourism: To provide Ontario's residents and out-of-province visitors with opportunities to discover and experience the distinctive regions of the province.

The Ontario Parks webpage is <http://www.ontarioparks.com/A.html>.

Rondeau Provincial Park

Operated by Ontario Parks, Rondeau Provincial Park is the core area and anchor of this IBA. Rondeau Provincial Park has a Park Management Plan and a Vegetation Management Plan. Its Natural Heritage Education program is fundamental to resource management and protection as well as communicating with and educating the public about these resources. Zoning within the management plan is crucial to protection of key habitats. Ongoing resource management activities by the park serve to increase habitat available to IBA species, as well as to restore degraded habitats. Management activities include deer herd reduction, prescribed burning, plantings in the development zones, removal of exotic species, and dune restorations.

The park webpage is <http://www.ontarioparks.com/rond.html>.

Municipality of Chatham-Kent

The recently amalgamated Municipality of Chatham-Kent, through powers granted through the Planning Act of the Ontario Ministry of Municipal Affairs and Housing, must develop an Official Plan for the Municipality with policies and regulations including a Natural Heritage Policy, an Economic Development Policy, and a zoning bylaw. Within the Natural Heritage Policy, the municipality shall have regard for provincially significant features such as wetlands, woodlands, and Species at Risk, and is encouraged to develop policies and regulations to protect provincially and regionally significant features and functions.

The Chatham-Kent webpage is: <http://www.city.chatham-kent.on.ca/>.

Friends of Rondeau

The Friends of Rondeau is a charitable, non-profit organization begun in 1985, which raises funds to encourage and support programs for interpretive, educational, scientific, historical, and protection and preservation purposes related to the natural and historical resources of Rondeau Provincial Park (Friends of Rondeau mandate). The Friends operate a bookstore and gift shop in the Visitor Centre and support the park through involvement in activities such as the annual Wings of Spring bird festival and Birders Breakfast in May, by providing funds for trail guides, a new bird viewing tower, equipment for the NHE program, and by supporting restoration and monitoring efforts within the park. Their role in assisting with the NHE program is substantial and has had a dramatic effect within the park. The Friends webpage is www.rondeauprovincialpark.ca.

Rondeau Bay Watershed Rehabilitation Project

The Rondeau Bay Watershed Rehabilitation Program (RBWRP) is a community-based organization. Its mission is to work in cooperation with local landowners and interest groups to integrate native, natural habitats into the agricultural landscape of the Rondeau Bay watershed while promoting species recovery and a measurable improvement in water quality. The project operates out of the OMNR office in Chatham. Specific project include prairie restorations, road-side tree plantings, an outreach program that includes a newsletter to watershed residents, and an initiative to eliminate the use of lead by sport fishers.

The Project's webpage is <http://www.ciaccess.com/~rbwrp/homepage.htm>.

Rondeau Bay Waterfowlers Association

This non-profit group of waterfowl hunters and conservationists is active in promoting conservation projects in the Rondeau Bay area that conserve, protect, and enhance the waterfowl habitat in the Bay. This group also actively manages the waterfowl unit within the Park and Rondeau Bay through a tripartite agreement with Ontario Parks and the Ontario Federation of Anglers and Hunters. RBWA members take part in an annual cleanup of the marsh, assist with exotic species removal within the marsh, and contribute to the overall benefit of users of Rondeau Bay through projects such as the restoration of the Shrewsbury dock.

The RBWA webpage is <http://www.netvine.com/rbwf/>.

Species At Risk Recovery Teams

Federal and Provincial Species At Risk (SAR) have recovery teams of experts from within and outside of government to develop recovery plans for listed species. Within the IBA, bird Species At Risk with Recovery Plans either published or in development, include Prothonotary Warbler, Acadian Flycatcher, and King Rail. Recovery Teams also exist for Red Mulberry and Spiny Softshell Turtle.

Stewardship Kent

Based in southern Ontario, the Private Land Resource Stewardship Program answers the question, "What positive role can agencies play in influencing the land management practices of private landowners?" In today's era of financial constraints, partnerships, and self-regulation, the stewardship program seeks to link landowners with funding, information, and expertise to ensure that good management practices flourish on private land. Stewardship Kent has an appointed council of private landowners as well as staff provided by the OMNR. Promoting good land stewardship within the municipality, Stewardship Kent's Vision is to: "Conserve and enhance the municipality for Chatham-Kent's forests, wetlands, wildlife, fish, soil, and water for today and tomorrow." The council's goals are: 1) To be educated by, and to educate rural landowners in the area of land stewardship; and 2) To bring together and utilize the strengths and resources of a variety of organizations and landowners in order to conserve our areas natural resources.

Stewardship Kent's webpage is <http://www.ontariostewardship.org/KENT/kent.htm>.

Lower Thames River Conservation Authority

The Lower Thames Valley Conservation Authority (LTRCA) is one of 38 conservation authorities in the Province of Ontario. LTRCA's jurisdiction, which includes the lower watershed of the Thames River, covers 3,275 square kilometres in southwestern Ontario and is home to 106,971 people. It includes 10 member municipalities. Conservation authorities have

broad mandates extending well beyond flood control. Some of the areas in which the LTRCA is active include flood control, land use planning and regulation (including determining and enforcing flood and fill lines), forestry, soil conservation, and conservation lands. McGeachy's Pond Management Area, a 15-hectare property, and 20 hectares of Rondeau Bay Marshes southwest of Shrewsbury are owned by the LTRCA.

The LTRCA webpage is <http://www.lowerthames-conservation.on.ca/Default2.htm>.

9.0 Opportunities

Rondeau Provincial Park attracts over 200,000 visitors annually, about 70 percent of which are from southwestern Ontario, Michigan, and Ohio (OMNR 1991). About two-thirds of camping visitors stay four or more days. The core area of the IBA, the park and its facilities, embrace the centre of activity for most visitors to this IBA. A group of volunteers, through the Ridgetown Chamber of Commerce, has initiated a spring birding festival called the Festival of Flight, to attract tourists from large urban centres including Detroit and Greater Toronto Area.

9.1 Rondeau Provincial Park Natural Heritage Education

The staff of Rondeau Provincial Park, through its Natural Heritage Education (NHE) program, provides year-round opportunities for the public to learn about and appreciate the natural and historical resources of the park. Services include guided hikes, evening programs, and a Junior Naturalist program. Although primarily a summer program, the NHE program also offers school programs throughout the school year and weekend programs such as nature hikes and indoor programs during the winter. Through these services, the public learns and appreciates the importance of providing and conserving essential habitat for wildlife, including bird populations. It is reasonable to suggest that these programs stimulate interest in and support for IBA species within this IBA and for the IBA program at large.

9.2 Wings of Spring

The Friends of Rondeau Provincial Park sponsors the Wings of Spring, an annual spring bird migration festival in which visitors are invited to participate in the festival and view waterfowl along the shorelines of the lake and bay. Together with the park's NHE program, the festival provides opportunities to inform visitors about the Tundra Swan, Greater Scaup, and other waterfowl that congregate in this IBA. Local artisans display their art, while local environmentalists offer a workshop. The Wings of Spring is run on the two weekends on either side of the school March break, and programs are run in the week in between to attract and educate school aged children who are on holidays. During that week a waterfowl workshop geared towards children and their families is run on several days.

9.3 Festival of Flight

In May, the Ridgetown Chamber of Commerce, in cooperation with Rondeau Provincial Park, conducts the Festival of Flight. This is a month-long event with bird-watching activities in the park including hikes, workshops, and evening programs, combined with awareness-type programs such as an art contest and viewing evening and craft workshops with a bird theme in Ridgetown. Thirty-eight species of warblers have been recorded in Rondeau Provincial Park. For Ontario birders, one of the must-see species is the Prothonotary Warbler, and the place to do that is Rondeau Provincial Park. The festival provides exposure for the high-quality bird watching that can be found in the area, attracting thousands of new visitors every year. The festival also encourages school class participation by providing the gate fees to the park, and the NHE program in the park provides educational programs on birds and their habitats. The Friends of Rondeau host Birders Breakfast throughout the month of May. This service provides a continental-style breakfast to early-morning birders, thereby encouraging use of the park during this period. Events such as the Festival of Flight can also be used to promote bird conservation issues. Eventually Rondeau Provincial Park should develop an IBA display for this type of event.

9.4 Rehabilitating the Watershed

The Rondeau Bay Watershed Rehabilitation Program (RBWRP) is a community-based remedial action plan established in 1993. The RBWRP cooperates with local landowners and interest groups “to integrate native, natural habitats including wetlands, woodlands and prairies into the agricultural landscape of the Rondeau Bay watershed while promoting species recovery and a measurable improvement in water quality” (Wonnacott et al. 2000). All IBA species – songbirds, marshbirds, waterfowl, and shorebirds – will benefit from the efforts of this program, which is designed to ensure a healthy watershed with viable ecosystems for the diverse life forms of “Carolinian Canada.” The RBWRP organized an Agricultural Hazardous Waste Day for farmers and rural residents to properly dispose of unwanted agricultural pesticides. Through Operation Farm Sweep, 4,109 litres of liquid pesticides and 924 kilograms of solid pesticides were collected. Some of these toxins included deregistered ones such as DDT and Chlordane; others were compounds that cause hormone-disrupting effects. The RBWRP is working towards a regular municipal collection program (McKay 2000). RBWRP volunteers have also removed about 11.5 tonnes of garbage from the shorelines of Rondeau Bay and the channel.

The RBWRP promoted the Carolinian Habitat Restoration Initiative to restore Carolinian woodland by planting about 20,000 native Carolinian trees and shrubs within the Rondeau Bay. Participants were encouraged to plant along stream banks and shorelines and to create or improve corridors between forest blocks and along existing wind and fencerows. The Envirocats environmental club from Harwich-Raleigh Public School participated in a tree and shrub planting project in the Blenheim area supported by RBWRP and the Municipality of Chatham-Kent (Hanson 2000). Supported by the OMNR’s Community Wildlife Involvement Program, local landowners and Ontario Hydro, the RBWRP coordinated the erection of a Bald Eagle nesting platform in a private sanctuary at the north end of Rondeau Bay.

The RBWRP has a broad network for mailings and communications. This network could be a

valuable means of communicating information about the IBA to the broader Rondeau Bay community.

9.5 Agricultural Practices – Environmental Farm Plan

The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) promotes stewardship on agricultural landscapes through Best Management Practices (BMPs) and incentive programs aimed at soil and water protection, particularly through Soil and Crop Improvement Programs such as the Kent Soil and Crop Association. The Environmental Farm Plan (EFP), a voluntary program of the Environmental Farm Coalition, encourages farmers to undertake environmental audits of their operations that are then subject to peer review. Areas of concern for the audit range from pesticide management and storage to erosion control measures to woodlot management and wildlife habitat enhancement. These programs have had an important role in the Rondeau area, reducing the environmental impacts of some farms. One challenge will be to broaden the interest in and practice of environmental friendly agriculture beyond a minority of farmers. Recent awareness and concern over protecting ground and surface water may generate additional opportunities to promote and expand environmentally friendly farming practices (e.g., vegetated stream buffers, no-till cropping). The EFP is delivered through a one-day workshop. An opportunity exists in that workshop to present bird conservation information relevant to the IBA, in either oral or written forms such as fact sheets on species or habitat management.

9.6 Fish and Wildlife Conservation and Recreation

The Rondeau Bay Waterfowlers Association (RBWA) promotes the protection and conservation of fish and wildlife and their natural habitat. Although the primary focus of the RBWA is waterfowl conservation, a healthy marsh ecosystem will not only provide habitat for breeding and migrating waterfowl, including IBA species like Tundra Swan and Greater Scaup, but also for IBA marsh-dependent birds such as King Rail, Least Bittern, and Forster's Tern. The RBWA assists with park projects to enhance the park environment. An annual dinner raises funds to support activities and projects that RBWA undertakes within the park. For example, the association has constructed about 100 metres of boardwalk, a viewing platform, and an observation deck so that disabled visitors can enjoy the waterfowl seasons. A waterfowl hunting blind for people with special needs is a recent addition (RBWA 2000). The RBWA could be a valuable partner for implementing several practical aspects of this conservation plan.

9.7 Research and Monitoring

Rondeau Provincial Park offers a variety of unique habitats and a number of species that are less common or even non-existent outside of the park. In particular, the park has a high number of VTE species that deserve further study to assist in species recovery elsewhere. The park also has its share of ecological "issues," such as those discussed in section 10. Many opportunities could be promoted for research or for restoration projects on topics such as exotic species, savanna restoration, or House Wren and Prothonotary Warbler interactions. Some university, government, and NGO organizations take advantage of this resource, but there is room for much more work.

10.0 Threats

Although the focus area of this IBA, Rondeau Provincial Park, has legislative protection, threats exist to habitats of IBA species inside and outside the park within the forest areas, marshlands, and open waters of the bay.

10.1 Changes in Vegetation

10.1.1 Forest Fragmentation

On a trip from Toronto to Detroit by stagecoach in 1837, Anna Jameson described trees along the Talbot Road as “interminable,” the foliage as “multitudinous,” and the wilderness “boundless” (Lambert and Pross 1967). Travelling Highway 401 through this same region today, a traveller may apply these same descriptive terms to ploughed furrows, crops, and agricultural fields. In the Municipality of Chatham-Kent, only 4 percent of the deciduous forests through which Anna Jameson travelled remain. This area is now an economically important part of the agricultural heartland of Ontario with some of the highest valued farmlands in Canada. Today, the Carolinian forests of southwestern Ontario are fragments, literally islands of private and public woodlands. Some fragments are logged and regenerating; others, ignored by loggers, are remnants of old-growth forest along steep ravines, on upland slopes, or in bottomlands.

Three of the larger woodlands in the Municipality of Chatham-Kent are within IBAs: Greater Rondeau Area (about 800 ha), Skunk’s Misery Complex (721 ha) and Clear Creek (300+ ha). Greater Rondeau Area IBA and Skunk’s Misery Complex IBA contain a high diversity of Carolinian forest-interior species of plants and animals, including rare flowering plants and breeding birds (Larson et al. 1999). Predictably, Clear Creek with its smaller size and relatively young woodland has fewer forest-interior species; however, it contains a four hectare remnant of old-growth forest that in all likelihood is representative of what a number of other woodlots scattered throughout the region would have been like (ibid.). In effect, this region of southwestern Ontario has scattered islands of old growth within islands of young forest, within a sea of agricultural furrows.

Forest fragmentation results in habitat loss. When only fragments remain, only isolated populations of forest species can exist. A central tenet in conservation biology and landscape ecology states that the key to long-term survival of populations of species within forest fragments is to reduce or eliminate the isolation among these fragments (Haddad et al. 2000, Harris and Silva-Lopez 1992). A popular strategy in conservation biology is the creation or retention of habitat corridors that link isolated fragments to permit the movement of organisms from one fragment to another (Harris and Silva-Lopez 1992). Corridors function better when they resemble the fragments they connect (e.g., a forest corridor connecting woodlots [Friesen 1995]). Although it may not be obvious to casual observers of birds that movement from one

forest to another would present a problem, the presence of corridors enhances the movement of some species (St. Clair et al. 1998). Some forest species will travel along forest edges rather than cross gaps such as agricultural fields.

In the agricultural landscape that separates the woodlands and woodlots within and adjacent to Greater Rondeau Area IBA, the creation of corridors could enhance dispersal opportunities for forest species. Fencerows facilitate short-distance movement for some species (ibid.). Forested corridors between woodlands may be feasible where ravines and tributaries extend across the agricultural landscape. Such corridors would also serve to buffer streams from erosion and agricultural runoff (Friesen 1995). Where large gaps exist, the creation of forested “stepping stones” may facilitate movement of biota (St. Clair et al. 1998) and be a prudent management strategy in light of the pervasive effects of habitat loss and fragmentation (Friesen 1995, Haddad et al. 2000, Plummer and Mann 1995).

10.1.2 Forest Structure

The effects of windstorms

A mature forest may seem a canopied oasis whose foliage in summer casts permanent shade on the forest floor. On closer inspection, openings or gaps are evident. Gaps in deciduous forest canopies may be caused by the toppling of weak or old, diseased trees. Branches from nearby trees often grow to fill such gaps. Windstorms may blow down numbers of trees within a forest, creating larger openings in the canopy. With light penetrating to the forest floor, sun-loving seedlings, shrubs, and ground-cover plants thrive. Regardless of the cause, openings in the canopy modify the structure of the forest and its species composition, both plant and animal. In time, the gap will close and the canopy will return.

Severe windstorms between 1976 and 1978 left openings in the canopy of Rondeau Provincial Park, creating a forest structure more suitable for Yellow-throated Vireo and Scarlet Tanager than Acadian Flycatcher or Cerulean Warbler (Woodliffe 1994). In openings overgrown with raspberry thickets, Mourning Warbler and Yellow-breasted Chat established breeding territories.

In July 1998 a catastrophic windstorm struck the shoreline of Lake Erie (Larson and Waldron 2000). Winds registering speeds of at least 180 kph in nearby Erieau devastated the largest mature stand of trees in the park. A blowdown of as much as 70 percent of the trees in some areas of the park changed the forest structure, especially the forest canopy, perhaps forever. Such an event as this is uncontrollable and foreseeable only in the statistical sense. The chance that such a windstorm tracking along the north shore of Lake Erie would cause such damage in Rondeau Provincial Park is less than once per thousand years. The extent of the damage to the forest, however, was due to a combination of factors specific to the Rondeau peninsula (ibid.). (See “The Great Windstorm of 1998 . . .” below). Damage to the canopy occurring during this windstorm had a dramatic effect on IBA species such as Acadian Flycatcher and Prothonotary Warbler by changing the habitat to a state that is less than ideal. Acadian Flycatchers prefer sites with mature, complete canopy closure, which has obviously been reduced in the park. Prothonotary Warblers have suffered from a combination of factors including loss of canopy closure, increased competition from House Wrens and Tree Swallows due to the opening of the canopy, and loss of cavities due to blowdown.

The effects of White-tailed Deer

White-tailed Deer were introduced into Rondeau Provincial Park from Algonquin Park in exchange for Wild Turkeys (*Meleagris gallopavo*) in the early years of 1900 (Lambert and Pross 1967). While the turkeys' existence in Algonquin Park was short-lived, as they were unable to survive in that northern environment, the deer thrived in Rondeau. In the presence of a continuous food supply and in the absence of natural predators, deer numbers increased dramatically.

Although White-tailed Deer are an important component of the ecosystem within this Natural Environment Park, high populations of deer have caused significant and undesirable effects on the vegetation and, indirectly, on other animals of the forest in the Greater Rondeau Area IBA (see section 7.1). Deer numbers have fluctuated in Rondeau since the early 1900s, over which time periodic culls were undertaken to reduce deer numbers. Culls were re-established in 1993, after many years without managing the population. The annual deer count in January 2001 found approximately 87 deer in the park, close to the target population of 65-75 deer for the park. Some biologists feel that the number should be reduced below normal carrying capacity, since the vegetation community in Rondeau has been severely affected by a prolonged period of over-browsing.

In 2001, park users can already see a dramatic recovery within the vegetation communities of the park. Trilliums, May Apple, and Jack-in-the-pulpit, which have not been seen outside deer exclosures for many years, bloomed in large numbers throughout the park. The shrub layer has also been recovering for the last couple of years, and the forest now has a much more developed understorey than prior to 1993. These signs support the use of active deer management to assist the park in maintaining the delicate ecological balance.

10.2 Competition and Predation

10.2.1 Competition from House Wrens

Prothonotary Warblers readily accept artificial nest boxes. As part of the Prothonotary Warbler Recovery Program, researchers and volunteers have made 200 nest boxes available for Prothonotary Warblers, mostly in historic nesting locations along the north shore of Lake Erie, 40 of which were placed in Rondeau (McCracken et al. 2000). In 2000, 13 pairs of Prothonotary Warblers established nests in the park, seven of them in natural cavities. Although some predation and nest abandonment did occur, Rondeau saw nine nests successfully fledge young (including second nestings or second attempts after predation). House Wren competition continued to be one of the largest factors affecting nest success. Male and female House Wrens destroy the eggs of other birds, including those of other House Wrens nesting nearby (Ehrlich et al. 1988). A forest edge and open forest species, House Wrens come into contact with Prothonotary Warblers along edges of their preferred habitat (see Section 4.1.1.1). Following the catastrophic windstorm in 1998 that felled more than 50 percent of the mature trees in areas of Rondeau Provincial Park, House Wren numbers increased significantly (McCracken et al. 2000).

House Wrens not only destroy eggs, take over the nest boxes, and build their own nests but the males will build “dummy nests,” thus rendering more boxes unusable by Prothonotary Warblers. Also, these warblers arrive in the breeding areas after House Wrens have claimed many of the sites. Furthermore, House Wrens routinely have two broods, making a nest box unavailable throughout the summer (McCracken et al. 2000). Reducing House Wren impacts is a primary concern for the recovery team.

10.2.2. Predation by Raccoons and Other Mammals

Raccoons, one of six major predators of forest birds in Carolinian forests, are omnivores, well suited to both rural and urban habitats (Terborgh 1989). Studies by Wilcove (ibid.) in rural and suburban woodlots identify raccoons as the most ubiquitous predators in these habitats. Sanderson (1988) estimates that raccoon numbers increased 15-20 times across North America since the 1930s. Raccoons in parks and cottage areas of Ontario are often artificially supported by human activity, e.g., food scraps in the garbage and feed put out for birds. Although feeding of any animals is illegal within Rondeau Provincial Park, here as in other Southern Ontario parks, campers and cottagers provide food for raccoons both inadvertently and intentionally. The problem persists, despite an information campaign to address this issue and some initial efforts to better manage garbage in centralized secured facilities.

Raccoons, opportunistic feeders, will predate ground-nesting and cavity-nesting species including birds and turtles. No studies have been done in the park to measure the extent of predation on ground-nesting and cavity-nesting birds; however, turtle populations have suffered nearly 100 percent egg loss to raccoons (perhaps slightly higher than other areas) (Mathis Natvik, pers comm., 2000). Only predator guards placed on nest boxes can effectively keep raccoons away from Prothonotary Warbler nest boxes (McCracken et al. 1999).

Opossums (*Didelphis virginiana*) also prey extensively on bird eggs and nestlings. The Opossum is a common mammal in Rondeau. In addition, domestic animals, particularly wandering or feral cats, have a major impact on nesting and ground feeding birds.


10.3 Non-native Flora and Fauna

10.3.1 *Phragmites* and Other Invasive Exotic Plants

Phragmites, or Common Reed, is native to North America, but recently an introduced European strain has spread aggressively in eastern North America along the edges of coastal marshes, freshwater marshes, ponds, and ditches (Bioscience 1998). Often an indicator of disturbed wetlands, *Phragmites* has increased as a result of industrialization and urbanization (Brown 1979). It can displace native wetland vegetation, spreading quickly via underground by rhizomes. Cutting or burning does little to stop its growth (ibid.).

In forested wetlands in which Prothonotary Warbler nests, tree falls open up the forest canopy, allowing more sunlight to penetrate the gaps where wetland shrubs, cattails, and *Phragmites* can fill in the pools of open water on which Prothonotary Warbler depends (McCracken 2000). By invading

marshland, *Phragmites* not only chokes out native marsh plants but also can fill in the entire marsh, eliminating the hemimarsh condition – 50 percent open water and 50 percent native marsh vegetation – the preferred habitat of marshbirds including Least Bittern, King Rail, and Forster’s Tern. The growth of *Phragmites* along edges of ponds and marshes reduces habitat for migrating shorebirds. Many of the species in this IBA can be adversely affected by the spread of this invasive plant.

Purple Loosestrife and European Frogbit (*Hydrocharis morus-ranae*) also continue to invade and thrive in wetlands throughout southern Ontario. Dense stands of these invasive species choke out native wetland species that may be important foods for wildlife and fish in many areas of Ontario. While Purple Loosestrife has been effectively controlled in some locations through introductions of the *Galerucella* beetle, effective and acceptable controls for *Phragmites* and Frogbit have not yet been found. Within Rondeau Provincial Park, Purple Loosestrife is relatively scarce and generally controlled by hand pulling (Dobbyn, pers com 

10.3.2 Mute Swan *Cygnus olor*

Mute Swan numbers have gradually increased in coastal marshes of the lower Great Lakes. In the summer of 2001 there were as many as eight to 10 adult Mute Swans in the Rondeau marshes. Because of their size and eating habits, these birds are of particular concern. High concentrations of Mute Swans can overgraze an area, causing a functional reduction in aquatic habitat (Ciaranca, Allin, and Jones, 1997). Populations in the Long Point area have already created “large holes” in the marsh vegetation (Petrie, pers comm.).

10.3.3 Gypsy Moth *Lymantria dispar*

A Eurasian species, the Gypsy Moth was accidentally introduced into eastern North America in the late 1860s (Liebold 1998). Subsequent attempts at eradication it have failed, and today populations exist throughout much of the continent. Gypsy Moth caterpillars feed on the leaves of hundreds of species of trees and shrubs but most commonly on oak and aspen. Populations of this moth are irruptive; a forest may have densities of only one egg mass per hectare to over 1,000 egg masses per hectare (ibid.). Butler (1996) describes an unpublished study of the effects of Gypsy Moth defoliation on forest birds. Eight years after severe defoliation, the populations of five forest-interior species decreased significantly or disappeared. Less severe defoliation in other areas examined resulted in little change in population numbers of songbirds. Although Gypsy Moth has been present in the park for many years, outbreaks have not occurred recently.

10.4 Soil Erosion, Sedimentation, and Contamination of the Bay

Where conventional tillage practices continue within the Rondeau Bay watershed, severe wind and water erosion transports top soil and agricultural chemicals, including fertilizers, herbicides, and pesticides into creeks and eventually into Rondeau Bay (McKay 2000). Soil erosion from agricultural fields and runoff that contains toxins may degrade nesting habitat by reducing food supplies (Gibbs et al. 1992). Marshbirds like Least Bittern may contract a roundworm parasite that thrives in waters polluted with silt and excessive nutrients in runoff from agricultural fields or in

storm water from residential communities (ibid.).

Soil eroded from agricultural fields in the watershed may eventually be deposited in Rondeau Bay. Sedimentation occurs where streams empty into the bay or where water currents slow, depositing their cargo of sediment. Sedimentation can affect feeding habitats of birds, fish, amphibians and reptiles; breeding areas of insects and fish and fish nurseries; the quantity and availability of nutrients and toxins and the availability and quality of light for producers within the bay ecosystem (Naiman et al. 1995). Extensive tilling of fields within the watershed, and the lack of vegetated buffers along drains and watercourses has exacerbated this problem. Hog manure, spread on farm fields from some of the large hog feedlots within the watershed poses a major water contamination risk, particularly when spreading manure coincides with major rainfall events.

10.5 Agricultural Pesticides

Black-bellied Plover and other shorebirds that migrate through the lower Great Lakes stop over, particularly during spring migration, to feed in the agricultural fields within and adjacent to the Greater Rondeau Area IBA. Environmental contaminants such as agricultural pesticides can pass up the food chain and may accumulate in the tissues of animals that are near the top. Agricultural pesticides, predominantly organophosphates, are widely used in North America. Shorebirds are also exposed to pesticides during migration. On their wintering grounds they are exposed to DDT (banned in Canada and the United States), which is still used in some Central and South American countries. Small numbers of shorebirds have been killed as a result of misuse of the insecticide-nematicide Furadan during its application on agricultural fields (Salabanks 1999).

Agricultural lands in this IBA offer opportunities for foraging shorebirds on migration. In April, before crops are in the field, Black-bellied Plovers and American Golden-Plovers forage for earthworms and other invertebrates. Shorebirds stopping over in the fall may forage in harvested fields for insects. Certain agricultural pesticides may reduce the numbers of invertebrate prey (Dodge and Kavetsky 1995).

In any watershed in which runoff from agriculture fields enters marsh habitat, concern about toxic contaminants in the ecosystem is understandable. Terns and wading birds such as Least Bittern are near the top of the food chain. Although no apparent problems have arisen in Rondeau Bay concerning contaminants, examples exist elsewhere in the Great Lakes system. In heavily polluted sites such as Green Bay, Lake Michigan, Forster's Terns exhibit reproductive problems (Martins 1997). The low-hatching success of Forster's Tern in Lake St. Clair is of concern; the levels of contaminants in the St. Clair River and Lake St. Clair are well documented. But further study of contaminant levels in these Forster's Terns is required before contaminants can be eliminated or confirmed as a cause (ibid.). Pesticide and PCB residues in Snapping Turtle eggs from Rondeau show declines in some toxins (Dobbyn, pers comm., 2001).

10.6 Loss of Habitat along Shoreline

The Chatham-Kent Community Strategic Plan (1999) includes the protection of natural

heritage and preservation of natural resources. Within the IBA the hamlet of Shrewsbury lies adjacent to and within a Provincially Significant Wetland along the north shore of Rondeau Bay. Interim control provisions have been placed on the hamlet prohibiting further development pending an environmental study to delineate the wetland and to examine potential impacts that future development may have on it (Chatham-Kent Community Strategic Plan 1999). The remnant marshes and wet fields remaining along the shoreline may provide habitat for King Rail and other marsh species (Goodwin 1995). Filling in of these marshes would result in further habitat loss.

Water levels in Lake Erie were unusually high from the 1970s to mid 1990s. Since the late 1990s, water levels have dropped, stimulating an interest in reclaiming dry (but previously inundated) coastal areas. This process of “hardening the shoreline” through the construction of dykes and weirs destroys natural shoreline marsh. The marshland and swamp forest habitat of several IBA species is affected by severe fluctuations of water levels. These species include Least Bittern, King Rail, Forster’s Tern, and Prothonotary Warbler.

10.7 Excessive Disturbance of Birds

10.7.1 Disturbance of Rafting Waterfowl

During migration, waterfowl congregate in large numbers called rafts, comprised of hundreds to thousands of birds. Rafting waterfowl are readily disturbed and put to flight by motorized watercraft or windsurfers. Such disturbance can force waterfowl to leave staging areas where they are resting and feeding. In doing so, these birds may unnecessarily expend energy required for migration, and possibly for reproduction when the disturbance occurs in spring (Knapton et. al., 2000).

10.7.2 Wake from Watercraft

The wake from motorized watercraft in channels and along shorelines of marshes can wash over nests constructed at water level by shoreline and marsh nesting birds such as Forster’s Tern. The unregulated use of personal watercraft (PWC) is currently a minor but potential concern because of and the increased availability and use of PWCs and possible disturbance to both breeding and migrating birds. Studies suggest that birds are flushed more often and from greater distance by PWCs than by conventional watercraft (Fraser 1998, Burger 1998). The ability of PWCs to zigzag close to shore near nesting habitat can present a significant problem to nesting birds and also increases shoreline erosion. A further concern is that PWCs can operate in waters too shallow for conventional watercraft, thus bringing them closer to edges of marshes and possibly within the open waters of marshes. Because of their size and manoeuvrability, PWCs can increase turbidity of the water by stirring up sediments. As well, they can destroy breeding grounds and nursery areas of fish, which in turn decreases the food supply for many marshbirds. Studies of Common Tern have shown that when nesting pairs are constantly disturbed and forced to leave the nest, eggs and chicks can be knocked out of the nest or preyed upon by gulls (Burger 1998). On hot days, embryos or very young chicks unable to seek shade may be killed by exposure. At present, due to low lake levels, disturbance of the marsh by watercraft is not an issue at Rondeau. However, it has the potential to

become an issue, as it is elsewhere in the Great Lakes.

10.7.3 Disturbance of Rare Birds

Rondeau Provincial Park attracts more than its share of rare birds and, consequently, birders. Occasionally, overzealous birders will leave the marked trails to pursue a rarity such as a Prothonotary Warbler. This type of behaviour, while uncommon, results in unnecessary disturbance to these birds.

The Great Windstorm of 1998: Was Some of the Damage Preventable?

In 1894, the year Rondeau Provincial Park was established, Isaac Gardiner, the first park ranger, described the park as “probably the largest and finest block of timber left in this section of the Province.” He further noted that “it is doubtful whether any other part of America of equal area could present a greater number of distinct species or a more splendid growth of individual trees” (Lambert and Pross 1967). Had Isaac Gardiner walked through the park after the summer of 1998, he would have been heartbroken. In July of that year an intense evening thunderstorm packing winds of over 180 kph blew down many large, mature trees throughout the park, reducing the canopy by as much as 70 percent in some areas (Larson et al. 1999, Larson and Waldron 2000). This devastation was caused by downward microbursts of cold winds originating from thunderstorm activity (NOVA 2000).

The greatest damage occurred in the largest, most mature woodland of the park, a stand of trees whose canopy stood high above that of the surrounding forest, exposed to the violent winds. Beneath the park’s thin layer of fertile soil lies deep, fine-grained sandy soil that provides little stability, especially when wet, for large trees. For almost 25 years prior to the storm, the water table in the park was much higher than during the previous half century. Larson and Waldron (2000) suggest that high water levels for such a prolonged period killed the deeper roots of these trees and compromised stability even further.

Former park naturalist Mathis Natvik wonders whether over-browsing by too many deer also contributed to the storm’s devastation. Within the forest are two exclosures constructed in 1978, each approximately .2 hectares in area, surrounded by three-metre fencing to prevent deer access. Over twenty years later the vegetation within these exclosures is impressive: a closed main canopy of mature trees, a mid-canopy of shade-tolerant saplings and shrubs, and a ground layer of luxuriant perennial woodland flowers – quite different from the browsed understorey of the forest outside the enclosure. Wandering through the forest after the storm, Natvik was struck by the observation that no wind-throws or blow-downs had occurred within the exclosures. In fact, blow-downs appeared to occur outside the exclosures, adjacent to gaps created by previous windstorms – gaps that were slow to regenerate because of the persistent over-browsing by deer. While the small size and number of the exclosures limit the conclusions that can be drawn from this observation, it does add one more angle to the many reasons why managing deer populations at Rondeau is necessary.

Windstorms generated by weather systems are unpredictable, but their effects might be tempered. A healthy forest may be able to reduce some of these effects. Maintaining the number of deer at an appropriate level would permit over time the regeneration of the forest’s vegetation structure and the recovery of the forest community of plants and animals, including IBA species, that call the Carolinian forest interior their home.

11.0 The Action Plan

The following action plan lays out the basics for bird conservation in the Greater Rondeau Important Bird Area. The vision, goals and objectives were developed by the IBA Steering Committee. Bulleted strategies or actions follow each goal and objective. Each action is followed by a suggested priority: H = high, M = moderate, L = low. The suggested group or person responsible for implementation is listed in parentheses. Implementation will depend upon the interest and commitment of stakeholders as well as the availability of resources.

Organizations, groups, and parties identified in the plan as potentially leading or being involved in some aspect of the action or strategy are listed below with their acronym:

Bird Studies Canada	BSC
Caldwell First Nation	CFN
Canadian Wildlife Service	CWS
Ducks Unlimited Canada	DUC
Federation of Ontario Naturalists	FON
Friends of Rondeau	FOR
IBA Steering Committee	IBASC
Kent Soil and Crop Association	KSCA
Nature Conservancy of Canada	NCC
Ontario Ministry of Natural Resources	OMNR
Ontario Nature Trust Alliance	ONTA
Rondeau Bay Watershed Rehabilitation Project	RBWRP
Rondeau Bay Waterfowlers Association	RBWA
Rondeau Provincial Park	RPP
Species-at-Risk Recovery Teams	SARRT
Stewardship Kent	SK
Lower Thames Valley Conservation Authority	LTCA

11.1 Vision

The Greater Rondeau Important Bird Area will promote conservation and stewardship to protect its global and national significance for breeding, wintering, and migratory birds, as a place where birds can be monitored, studied and enjoyed for the ecological, educational, economic and recreational benefits of the people of Ontario and beyond.

11.2 Goals, Objectives, and Strategies

1. Promote resource use and management activity that sustains, enhances, or does not negatively impact native bird populations or their habitats

- A. Promote agricultural land use and management that conserves or enhances natural habitat and reduces impacts of farming on surface water, ground water, and soil erosion
- Support and promote the implementation of wildlife-friendly and erosion-reduction components of the Environmental Farm Plan in and adjacent to the IBA **(M)** (KSCA, SK, RBWRP)
 - Encourage buffers for all drains and watercourses emptying into Rondeau Bay **(ongoing)** (KSCA, SK, RBWRP)
 - Work with the municipality to develop conservation-based practices such as conservation tilling, that would reduce the need for drain maintenance and promote natural habitats **(M)** (KSCA, SK, RBWRP)
 - Establish projects to develop interior wetlands and demonstration projects to showcase conservation practices and alternatives **(M)** (KSCA, SK, RBWRP, DUC)
- B. Increase the amount of forest cover and forest connectivity between Rondeau Provincial Park and other large forests in Chatham-Kent
- Promote forest connectivity along the Lake Erie shoreline **(M)** (OMNR, NCC, FON, LRCA)
 - Initiate a land trust in the Chatham-Kent area to identify and secure target areas **(M)** (ONTA, NCC, RBWRP)
 - Encourage the Municipality of Chatham-Kent to develop a policy to promote forest connectivity, designate regionally significant forests, valley lands, and river corridors, and recognize the concept of ecological restoration in the Natural Heritage section of its Official Plan **(H)** (RBWRP, IBASC, LTCA)
- C. Protect the natural shoreline of Rondeau Bay
- Actively conserve all remaining coastal marshes in Rondeau Bay **(H)** (RBWRP, RBWA, IBASC, OMNR, FON, LTCA)
 - Encourage the municipality and province to provide landowners with tax relief for privately owned coastal wetlands **(M)** (FON, ONTA, NCC, OMNR)
 - Encourage planning regulations that protect remaining wetlands from filling or shoreline hardening **(H)** (RBWRP, FON, IBASC, LTCA)
 - Encourage securement of privately owned wetlands **(M)** (NCC, FON, ONTA, OMNR, DUC)
 - Develop a land trust to actively secure wetlands **(M)** (ONTA, NCC, DUC, LTCA)
- D. Continue program of deer herd management in Rondeau Provincial Park at levels that allow understorey regeneration
- Conduct annual deer counts **(ongoing)** (RPP)
 - Conduct a regular deer herd reduction to maintain low population **(ongoing)** (RPP, CFN)

- E. Develop and implement measures to reduce the impact of predators on IBA Species At Risk
- Continue to enhance garbage management strategy for Rondeau Provincial Park (**ongoing**) (RPP)
 - Design experimental protection of Prothonotary Warbler sites from raccoons and other predators (**ongoing**) (RPP, SARRT)
 - Request Rondeau Provincial Park to distribute “Cats Indoors” flyers at the Rondeau Nature Centre (**M**) (RPP, IBASC)
- F. Encourage Rondeau Provincial Park to adopt the following policies and procedures with regard to boat use in the park marshes:
- Exclude all motorized watercraft from interior areas of Park marshes from April 30 to August 1 (**M**) (RPP)
 - Exclude all access to sections of the marsh where there are tern colonies from April 15 to August 1 (**M**) (RPP)
- G. Reduce *Phragmites* in slough forests through shading
- Target areas for restoration projects such as planting areas with rapid growing wetland trees (e.g., Silver Maple, Tulip-tree) (**M**) (RPP)
 - Hold volunteer planting days to undertake work (**M**) (RPP, FOR, RBWRP)
 - Use FON’s Working for Wilderness program to undertake this project (**M**) (RPP, FON)
2. Monitor populations of all IBA species (and all Species At Risk) and habitats within the IBA
- A. Develop protocols for monitoring all IBA species, and capacity for storing data
- Design a study to identify predators and levels of predation on Prothonotary Warbler nests (**H**) (RPP, SARRT, BSC)
 - Continue existing protocols for marsh monitoring and forest bird monitoring (**ongoing**) (BSC, RPP, SARRT, CWS, OMNR)
 - Undertake colonial waterbird surveys to complement CWS surveys (**H**) (BSC, CWS, RPP, SARRT, OMNR)
 - Monitor all breeding provincial and federal Species At Risk on an annual basis (**H**) (BSC, CWS, OMNR, RPP, SARRT)
 - Establish formal protocol to monitor waterfowl and shorebirds (**M**) (RPP, RBWA)
- B. Map the distribution of plant communities and breeding sites of avian Species At Risk at regular periods over time to clarify the relationship of plant communities and bird distribution.

- Conduct aerial surveys and ground truths to map Rondeau Provincial Park vegetation communities (**L**) (RPP, OMNR)
 - Map and measure *Phragmites* distribution and patch size over time (**L**) (RPP, OMNR)
 - Ground truth the findings from the aerial surveys (**L**) (RPP, OMNR)
 - Explore potential to use remote sensing (Landsat imagery) as a mean of monitoring *Phragmites* (**L**) (RPP, OMNR)
 - Map breeding sites of avian Species At Risk (RPP, OMNR)
 - Map changes in aquatic vegetation over time (**L**) (RPP, OMNR)
 - Design a study to compare the presence and abundance of marshbirds in various community types, including communities dominated by *Phragmites* (RPP, OMNR)
- C. Monitor hardening of the shoreline of Rondeau Bay
- Compile data over time on shoreline hardening of Rondeau Bay and make available for analysis (**L**) (RBWRP, OMNR, IBASC)
3. Develop education and awareness tools and programs in support of bird conservation throughout the IBA and in the Municipality of Chatham-Kent
- A. Develop educational products and approaches for the farming community
- Create fact sheets on selective IBA species for the farming community (**H**) (RPP, FON, KSCA, RBWRP, SARRT, CWS, OMNR, SK)
 - Provide information on the value of birds in pest management for farming organizations such as Kent Soil and Crop (**M**) (RPP, FON, KSCA, RBWRP, SK)
 - Write an article on the IBA for circulation in local farming newsletters and tabloids (**H**) (RPP, RBWRP, FON, KSCA, SK)
 - Participate in a farming workshop/symposium to share educational materials and promote Goal 1 to the farming community (**M**) (IBASC, RBWRP, FON, KSCA, SK)
 - Write an article for the local press about the IBA (**M**) (RPP, IBASC, RBWRP, FON)
- B. Encourage government agencies to develop policies and approaches that are supportive of the IBA
- Provide copies of the completed Conservation Plan to all major stakeholders within the IBA (**H**) (IBASC, FON)
 - Participate in the Chatham-Kent Official Plan development/review process (**M**) (RBWRP)
- C. Promote and support the IBA within Rondeau Provincial Park
- Recognize the IBA, its goals, and objectives in the Rondeau Provincial Park Management Plan (**H**) (RPP, OMNR)

- Infuse information on the IBA into the Rondeau Provincial Park Interpretive Program (**M**) (RPP)
- Develop materials for park residents to promote activities that support IBA species, and alert them to actions that can have a negative impact (e.g., garbage storage, certain types of bird feeding) (**H**) (RPP)
- Develop signage and install in appropriate places to support Objective 1F. (RPP, FOR)

D. Hold events to promote and celebrate the IBA

- Hold a dedication ceremony for the IBA (**H**) (IBASC, RPP)
- Install a plaque within the park dedicating the IBA (**H**) (IBASC, RPP)
- Conduct an event on the IBA, its species, and habitats for the Rondeau Bay Waterfowlers Association and other interested groups (**M**) (IBASC, RPP)

11.3 Implementation

The core area of this plan is Rondeau Provincial Park. Consequently the burden of implementing core area initiatives falls with the park. Park staff, through the Rondeau Provincial Park Management Plan, is currently involved in implementing many of the objectives and actions described above. They are, in effect, already implementing much of this plan. Incorporating its tenets into the Management Plan would formalize and solidify the park's long term involvement in the IBA and could provide some direction to park initiatives.

Beyond the park boundaries lies the IBA buffer area, which is of great importance to the Rondeau Bay watershed and supports, directly or indirectly, many of the IBA species. Implementation of objectives and actions in this area depends on the interest and involvement of organizations such as the Chatham-Kent Stewardship Council and the Rondeau Bay Watershed Rehabilitation Program, as well as the farming community. With regard to waterfowl in the bay, the involvement and interest of the Rondeau Bay Waterfowlers Association is essential.

Coordination of efforts, particularly beyond the park boundaries, requires consultation and structure to be effective. Whether or not a committee exists, it would be valuable for present IBA committee partners to meet on a regular basis (e.g., annually) to review implementation priorities and available resources. Implementation of parts of this plan is contingent upon access to resources. Communications between partners is critical to avoid competition for the same resources. Ideally, partners should focus on mutually beneficial projects. Three potential funding sources for projects are the federal and provincial Species At Risk programs, the Eastern Habitat Joint Venture (EHJV), and funds through the Stewardship Council. The Species At Risk programs have funds attached to them for stewardship work, monitoring, and management. The EHJV has been the delivery mechanism for the North American Waterfowl Management Program but is expanding to include other bird groups including colonial birds, landbirds, and shorebirds.

12.0 Evaluation

Planning in complex circumstances should include a system of evaluating progress, rethinking goals and objectives, and revising actions. This iterative approach to planning means not only that the plan is open to revision but also that evaluation and revision are a fundamental part of the planning process. The FON and its national partners are committed to supporting IBAs in plan implementation. Local stakeholders have already invested in the IBA and have a stake in its success.

A mechanism to oversee implementation of these actions should be established. Rondeau Provincial Park, the Rondeau Bay Watershed Rehabilitation Program, Stewardship Kent, and the various Recovery Teams are all expected to play roles in implementation of this plan, as much of it supports their individual mandates. An annual update on the conservation plan implementation would be of great value to the CNF, FON, and BSC.

As Greater Rondeau IBA has joined the global family of IBAs, information on the IBA will be incorporated into BirdLife International's global IBA database. This database will be used to report on conservation progress in IBAs. The information required is listed below.

- ❑ summary of general progress by the stakeholders group;
- ❑ update on actions, objectives, and goals;
- ❑ changes in actions, objectives, and goals;
- ❑ any changes in threats affecting the IBA species and site;
- ❑ copies of any media coverage or materials produced;
- ❑ an updated list of groups involved in the stakeholder group;
- ❑ successes and failures within the IBA.

“A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise.”

– Aldo Leopold *The Land Ethic*

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Appendix 1. IBA Program Partners

BirdLife International (BL)

A pioneer in its field, BirdLife International is the first non-government organization dedicated to promoting world-wide interest in and concern for the conservation of all birds and the special contribution they make to global biodiversity. BL operates as a partnership of non-governmental conservation organizations, grouped together within geographic regions (e.g., Europe, Africa, the Americas) for the purpose of planning and implementing regional programs. These organizations provide a link to on-the-ground conservation projects that involve local people with local expertise and knowledge. There are currently 20 countries involved in the Americas program throughout North, Central, and South America. For further information about BirdLife International, check the following webpage: <http://www.birdlife.net/>.

The Canadian Important Bird Areas Program has been undertaken by a partnership of two lead agencies. The Canadian Nature Federation and Bird Studies Canada are the Canadian BirdLife International partners.

The Canadian Nature Federation (CNF)

The Canadian Nature Federation is a national conservation organization with a mission to be Canada's voice for the protection of nature, its diversity, and the processes that sustain it. The CNF represents the naturalist community and works closely with provincial, territorial, and local affiliated naturalists organizations to directly reach 100,000 Canadians. The strength of its grassroots naturalists network allows it to work effectively and knowledgeably on national conservation issues that affect a diversity of ecosystems and human populations in Canada. The CNF also works in partnership with other environmental organizations, government and industry, wherever possible. Its approach is open and cooperative while remaining firm in its goal of developing ecologically sound solutions to conservation problems. CNF's webpage is <http://www.cnf.ca>.

Bird Studies Canada (BSC)

The mission of Bird Studies Canada is to advance the understanding, appreciation, and conservation of wild birds and their habitats in Canada and elsewhere through studies that engage the skills, enthusiasm, and support of its members, volunteers, staff, and the interested public. BSC believes that thousands of volunteers working together, with the guidance of a small group of professionals, can accomplish much more than could the two groups working independently. Current programs collectively involve over 10,000 volunteer participants from across Canada. BSC is recognized nation-wide as a leading and respected not-for-profit conservation organization dedicated to the study and understanding of wild birds and their habitats. BSC's webpage is <http://www.bsc-eoc.org>.

Federation of Ontario Naturalists (FON)

The Federation of Ontario Naturalists protects Ontario's nature through research, education, and conservation action. FON champions wildlife, wetlands, and woodlands and preserves essential habitat through its own system of nature reserves. FON is a charitable organization representing 15,000 members and over 105 member groups across Ontario. FON's webpage is <http://www.ontarionature.org>