Matchedash Bay Important Bird Area Conservation Action Plan

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Prepared for the Matchedash Bay Important Bird Area Stakeholders

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Executive Summary

The Matchedash Bay Important Bird Area (IBA) contains a great variety of habitats from open water to oak savanna woodland. It boasts large numbers of Least Bittern, a Species of Concern nationally and Vulnerable provincially, and one of the reasons why Matchedash Bay qualifies as a nationally significant IBA. The Black Tern, a species that is listed as Vulnerable in Ontario, nests at Matchedash, and summer records of the King Rail suggest that it may also nest there. This latter species is both federally and provincially Endangered.

Important Bird Areas are recognised around the world as the most important sites for protecting bird diversity. Matchedash Bay is one of approximately 1,200 IBAs recognised in Canada.

This plan is the product of a collaborative effort of numerous stakeholders, particularly the MTM Conservation Association, the non-profit organization responsible for management of the Matchedash Bay Provincial Wildlife Area. Discussion of IBA species, and the significance of the IBA and its natural features, takes place in Chapters 4 and 5. The results of valuable monitoring work undertaken by volunteers are presented in Appendices 2 and 3. This plan should be considered a work in progress. The national and provincial IBA partners encourage the stakeholders of the Matchedash Bay IBA to revise and rework the plan as needed, but most importantly, to implement it.

The vision and goals of the IBA follow:

Vision

The Matchedash Bay Important Bird Area will be conserved and managed to protect, restore, and enhance its significance for resident and migratory birds, as a place where birds can be monitored, studied, and enjoyed for the ecological, educational, and economic benefits to the people of Severn Township and beyond.

Goals

1) Protect and conserve significance of Matchedash Bay for Black Tern, Least Bittern, King Rail, and other marsh birds.
2) Undertake monitoring and research on species of concern.
3) Protect adequate habitat in sanctuary for waterbirds and waterfowl.
4) Develop communication strategies and actions to promote bird conservation among partners, stakeholders, and the public.
5) Assess and address the issue of habitat degradation, and develop a plan to mitigate losses and restore habitat.
6) Facilitate public opportunities and access to appropriate sites for observation of waterbirds, waterfowl, and landbirds.

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Canadian Nature Federation and Bird Studies Canada are the national partners of BirdLife International in Canada. The Federation of Ontario Naturalists is responsible for site conservation planning in Ontario IBAs.

The following people, listed alphabetically by last name, were part of the Tiny Marsh IBA Steering committee. They have contributed considerable time and effort to the development of this conservation plan and to the conservation of Tiny Marsh: Bob Bowles, Jim Broadfoot, Robin Craig, Andy Fletcher, Dorothy and Sid Hadlington, Margo Holt, Mike Lavin, Bob Livsey, Dave McLachlin, Dan Middleton, Jim and Pat Woodford.

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1.0 Introduction

A vast expanse of open water and marsh to the east caught her eye as we motored north on Highway 400 near Port Severn. "Do we have time to explore that bay?" she asked. I obligingly turned off at the first exit past Waubaushene, trying to guess which road to take and what she had in mind. As luck would have it, her keen eyes spotted a Ducks Unlimited sign signalling an access to the expansive wetland area.

The sun was just setting as we set out on the small trail. A cacophony of sounds emanated from the wetland – a Sedge Wren chorus punctuated with the insect-like buzzes of LeConte's Sparrow from the sedge meadow, and an amazing mix of grunts, coos, and cackles from numerous marsh birds in the cattails. We were able to distinguish Least Bittern, American Bittern, Sora, and Common Moorhen before the mosquitoes changed our plans.[1]

This wetland complex is, of course, Matchedash Bay, the largest coastal wetland on Georgian Bay. The Matchedash Bay Important Bird Area (IBA) is made up of a great variety of habitats from open water to oak savanna woodland. It boasts large numbers of Least Bittern, nationally a Species of Concern and provincially Vulnerable, and one of the reasons why Matchedash Bay qualifies as a nationally significant IBA.

Important Bird Areas are recognised around the world as the most important sites for protecting bird diversity. Matchedash Bay is one of approximately 1200 IBAs recognised in Canada. In addition to Matchedash's significance for Least Bittern, Black Terns nest there, and summer records of King Rail suggest that it may also nest in this area. This latter species is both federally and provincially Endangered.

This conservation action plan lays out the framework for bird conservation action in the Matchedash Bay IBA. It is intended to be a "work in progress." Sections of the plan describing the site, its birds, and the institutional arrangements are presented in Chapters 3 to 7. Chapter 8 is about the stakeholder activity in the area, while Chapters 9 and 10 explore opportunities within the Important Bird Area (IBA) for conservation as well as threats to the IBA species. Chapter 11 elaborates the conservation action plan, presenting the vision, goals, objectives, and strategies.

The Vision of the Matchedash Bay IBA follows:

The Matchedash Bay Important Bird Area will be conserved and managed to protect, restore and enhance populations of resident and migratory birds, as a place where birds can be monitored, studied, and enjoyed for the ecological, educational, and economic benefits of the people of Severn Township and beyond.

[1] E. Cheskey, 2001

Figure 1. Matchedash Bay IBA Map

2.0 The Important Bird Area 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 co-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 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.

In Ontario, the Federation of Ontario Naturalists is conducting community conservation planning in approximately 20 sites as of 2001. Community conservation planning means engaging the local community in the development and implementation of the conservation plan. While the program at all stages is a voluntary one, the advantages of IBA recognition extend beyond those of conservation of IBA species. Community conservation planning means that people with common interests are brought together to focus on shared concerns. Each stakeholder brings a different perspective to the table, and the process that follows can take unexpected and innovative directions. Along with the development of a conservation action plan, the program also offers a dedication ceremony focusing attention on the site.

3.0 IBA Site Information

Site: Matchedash Bay, CAON035N
Location: 44°45' N, 79°40' W

Figure 2. Matchedash Bay

Matchedash Bay IBA, 18 square kilometres in area, is located in Severn Township (population 10,257), Simcoe County, near the southeastern end of Georgian Bay (Figure 1). The marshes of Matchedash Bay are the largest and most diverse along the Georgian Bay shoreline. The southern half of the IBA contains the extensive marshlands at the confluence of the Coldwater and North Rivers, while the northern half encompasses the marshes and open water of Matchedash Bay. Water from the bay empties into Severn Sound, a large sheltered passage of open water separated from Georgian Bay by Beausoleil Island. The villages of Coldwater, Waubaushene and the hamlets of Fesserton and Lovering,lie just outside the boundaries of this IBA**.**

This IBA lies within the Manitoulin-Lake Simcoe ecoregion. This ecoregion experiences warm summers and relatively mild winters, with a mean summer temperature of 16.5°C and a mean winter temperature of -4.5°C. Precipitation locally is in the range of 750-1,000 mm per year, evenly distributed throughout the year. Prevailing winds across Lake Huron and Georgian Bay in winter bring ample snowfall to the northern sections of Simcoe County, resulting in the county's designation as the "snowbelt" of central Ontario.

Matchedash Bay IBA is situated on the geological contact between the granites and gneisses of the Canadian Shield and the limestone bedrock of Southern Ontario. Soils along the western boundary are silt and clay of glacial Lake Algonquin. Underlying the bay and marsh is limestone plain providing the flat and poorly drained terrain that gives rise to the wetland habitats of the IBA. East of the bay are flat, poorly drained farmlands while to the north the bare rock knobs and ridges of the shield protrude through very shallow soils, giving a "northern" appearance to the landscape.

Matchedash Bay is bordered by pastureland and some cottages along its eastern perimeter. The western perimeter abuts County Road 16 and an abandoned railway line. This line is being developed as part of the Huronia loop of the Trans-Canada Trail system. Several drainage ditches channel water to the marsh from adjacent agricultural fields. The Matchedash Bay basin is fully described in *A Biological Inventory and Evaluation of Matchedash Bay Provincial Wildlife Area* (Ontario Ministry of Natural Resources 1990).

4.0 IBA Species Information

4.1 IBA Species

In Matchedash Bay IBA, 226 species of birds have been recorded, of which 131 breed. Three of these are identified as IBA species. The Least Bittern (*Ixobrychus exilis*) is designated a Species of Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Monitoring conducted during the breeding season in 2000 found a total of 16 territories in the two portions of the marsh surveyed, although more territories likely exist since much of the marsh is inaccessible (Holt 2000). Sixteen territories would represent 1-2 percent of the estimated Canadian population. King Rail (*Rallus elegans*) has been observed in three consecutive summers, the most recent a male on territory in 2000 (Holt, pers. comm. 2001). Whether the King Rail nests here is not known; however, should one pair do so, that would be nationally significant, given its status in Canada. Black Tern (*Chilidonias niger*) is designated as Vulnerable provincially; as many as 17 nests of this species have been found in Matchedash Bay IBA (ibid.). During periods of low lake levels (e.g., 1998-2000), the marshes of Matchedash Bay appear to be unattractive to this tern, which may have shifted its breeding population west to Sturgeon Bay (ibid.), Tiny Marsh IBA, or Wye Marsh IBA. Dunn and Agro (1995) point out that Black Terns may abruptly abandon their nest sites when the emergent vegetation is altered by drought or flooding, and choose another. They cite a study in which Black Tern re-nested up to 42 km away. Although no Canadian population estimate is available, a threshold of 50 pairs for significant colonies has been used in a Canadian regional study (*Priority Migratory Bird Habitats of Canada's Prairie Provinces 1990*)**.**

4.1.1 Least Bittern (*Ixobrychus exilis*)

Least Bittern is the smallest heron (28-36 cm) and the most inconspicuous. Its presence in the dense emergent vegetation which it favours is often revealed by its dove-like cooing, by a glimpse of its brief flight across the marsh, or perhaps when it is exposed in the "freeze" position – bill pointed skyward, feathers compressed, and eyes in apparent contact with the 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, which include 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 marshes that dot the landscape south of the Shield in the Peterborough area (Sandilands and Campbell 1988). In the late 1800s in Ontario, Least Bittern was locally common and abundant in marshes of the lower Great Lakes. Since the 1960s, a decline in numbers has been documented in several regions of Ontario, particularly in the south-central region, including Simcoe County. States bordering Ontario (i.e., Michigan, Ohio, and New York) have also experienced declines.

The behaviour, habits, and habitat of this bird make determining population size and trends difficult to obtain and hence to analyse. For example, with the exception of Florida, Breeding Bird Surveys data have been too few to permit assessment of populations of Least Bittern in North America. Its abundance ranges from rare to locally common. The consensus among North American birdwatchers and ornithologists, however, is that Least Bittern has not only declined over much of its range but has also been extirpated from some areas. In 1988, Sandilands and Campbell described the status of Least Bittern as rare, while in 1994, Austin and Cadman described the status in Ontario as threatened. In 2000, Least Bittern is a Species of Concern nationally and Vulnerable provincially.

Natural history

The natural history of the Least Bittern is well described by Gibbs et al. (1992). The Least Bittern selects freshwater (or brackish) marshes with tall, dense emergent vegetation such as 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. Least Bitterns avoid dry conditions and benefit from stable water conditions. Nest density ranges from one to 15 nests per

hectare. Breeding pairs are not strongly territorial and are usually solitary nesters, but under ideal conditions they appear to be loosely colonial (Sandilands and Campbell 1988). One nest per hectare appears to be typical, however.

The nest of the Least Bittern is an elevated platform with an overhead canopy built of emergent vegetation and sticks. The canopy is created 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 one metre. Clutch size ranges from two to seven eggs, the usual number being three or four. The success rate from egg laying to fledged young varies from 20 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 shoots 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 the birds 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. The Least Bittern, in turn, is fed upon by snapping turtles (*Chelydra sepentina*) from below and Red-tailed Hawks (*Buteo jamaicensis*) and Northern Harriers from above. Marsh Wrens (*Cistothorrus palustris*) are known to puncture Least Bittern eggs, while American Crows (*Corvus brachyrhynchos*) raccoons and minks take both eggs and nestlings.

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 wetland. In Southern Ontario, many wetlands have been converted to other uses – the major ones being agricultural reclamation and urbanization. Since pre-settlement times, almost 70 percent of the Ontario wetlands south of the Precambrian Shield have been lost. Some of these wetlands would have provided habitat for the Least Bittern. Wetlands that remain don't necessarily guarantee appropriate habitat for marsh birds. In agricultural areas, siltation from erosion and runoff containing pesticides may degrade nesting and/or foraging habitats. The habitat may also become degraded should Phragmites (*Phragmites*) and/or Purple Loosestrife (*Lythrum salicaria*) invade the marsh. Natural succession within a marsh makes it uninhabitable for Least Bitterns. High water levels may eliminate habitat. Storm water runoff from urban or agricultural areas appears to create conditions that make these bitterns vulnerable to parasitic nematode worms. Recreational activities may reduce either breeding or foraging success (Gibbs et al. 1992). Lastly, the coastal marshes without dykes, such as those at Matchedash Bay, become less suitable for Least Bitterns during periods of low lake levels when their marsh habitat is replaced by extensive mud flats. Global warming may result in lower Great Lakes levels, impacting coastal habitat quality and quantity. During the surveys conducted in 2000, the 16 Least Bitterns were all located in dyked marshes.

4.1.2 King Rail (*Rallus elegans*)

About the size of a small 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*) but 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 regions, from the Atlantic coast west to the Great Plains of the continent. Populations also exist in the Greater Antilles and interior of Mexico. In Canada, this rail is found only in Southern Ontario. While some populations in the southern U.S. 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. The decline is particularly noteworthy in Ohio, where in the early part of the twentieth century the 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 100 years ago in the large marshlands of western Lake Erie and Lake St. Clair. Results from the Ontario Breeding Bird Atlas, 1981-85, indicate that the King Rail had become very rare in this breeding area with the exception of Walpole Island marshes, considered the main breeding location in Ontario. 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 onward 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.

In 1997, an intensive search for King Rails was undertaken in southwestern Ontario. A total of 32 King Rails were located on territory in seven marshes, and more than 50 percent of the rails found were in Walpole Island marshes (Friesen, 1999). 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 plus remaining fragments in southwestern Ontario may yet provide suitable habitat. Tiny Marsh IBA is along this Bruce Peninsula to Kingston corridor.

Natural history

Meanley (1992) and Reid et al. (1995) describe the natural history of the King Rail. The bird's habitat is the habitat 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 the mid-day (del Hoyo 1996). Even shallow water in broad

roadside ditches with cattails or shrub swamps or upland fields near water may provide habitat.

The King Rail builds its nest in a clump of emergent 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, but by six weeks, the young are feeding themselves, although they remain in the company of their parents (Meanley 1992). While King Rails are omnivores, crayfish and aquatic insects are their main food. Foraging is mainly diurnal and always within a few steps from cover.

Raccoons, Red Fox (*Vulpes vulpes*), Striped Skunk (*Mephitis mephitis*), and minks prey on King Rails, especially their nests. Both the Great Horned Owl and Northern Harrier prey upon adults. In marshes close to human habitation, cats and dogs may kill adult rails, since the birds are slow to flush (Reid et al. 1995).

With the exception of Walpole Island, the heart of Ontario's King Rail population, where Ducks Unlimited Canada (DUC) has no managed wetlands, almost all the remaining King Rails in Southern Ontario have been observed in or near DUC projects (Wemer 1997). DUC managed marshes are maintained in hemimarsh conditions, i.e., about half diverse marsh of emergent vegetation and half open shallow water. Marsh succession can ultimately proceed to a lockup stage that results in an old and stagnant marsh choked with vegetation that accumulates most of the marsh nutrients (Pittaway 1997). Pittaway (1999) argues that many of Ontario's marshes are in lockup stage and are unsuitable for many marsh species. 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 these factors include: water depth greater than 25 centimetres; chemical contaminants that reduce crayfish and aquatic insects; high numbers of mammalian predators which cause nest failure, particularly in fragmented marshes; and Phragmites (*Phragmites*) and Purple Loosestrife (*Lythrum salicaria*), which compromise the quality of the habitat.

4.1.3 Black Tern (*Chilidonias niger*)

This marsh tern is distinctive in breeding season with its black head and underparts and thus is readily identified when aerial feeding over a marsh. Outside of this season, however, its plumage exhibits very little black at all.

Distribution and abundance

The Black Tern is a localized breeder, concentrating in areas of highly productive wetlands in Eurasia and North America. In Eurasia, it breeds between the latitudes of southern Scandinavia and southern Spain, east through Europe to central Asia (del Hoyo 1996). In North America, it breeds from northern United States through central Canada. Specifically, in Canada, it breeds in appropriate habitat in a broad band from east of the

Coast Ranges of British Columbia, across the Prairie Provinces, through Ontario and into southern Quebec. Its northern limit extends to Great Slave Lake. Since the late 1930s, it has extended its range east to the New Brunswick-Nova Scotia border marshes. In Ontario, its range extends sporadically throughout much of the province, north to Fort Albany on the James Bay coast and west to Sandy Lake, District of Kenora (Austen et al. 1994). The Black Tern winters in marine habitat along the coasts of Central and South America.

In the 1930s, Black Terns occupied every extensive marshland in Southern Ontario (ibid.). Surveys undertaken since the 1960s indicate declines in the species at several marshes. As a result, the Black Tern was listed as threatened (ibid.). Similar declines have occurred throughout North America and Europe since the 1960s (Dunn and Agro 1995). Although not globally threatened, many local populations are vulnerable and declining throughout its range (del Hoyo 1996b). Considered Not-At-Risk nationally, the Black Tern is designated as Vulnerable in Ontario.

Natural history

The natural history of Black Tern is thoroughly summarized by Dunn and Agro (1995). The habitat of the Black Tern includes freshwater marshes, sloughs, wet meadows, and swamps. This species breeds in cattail and bulrush marshes of at least five hectares in size, although those greater than 20 hectares are preferred, provided that there are fairly extensive stretches of open water (Messier and Rail 1996). Drainage of wetlands such as these has occurred throughout North America and Europe for agriculture, urban and industrial development. Such wetland reclamation is implicated throughout the industrial world as a cause of the decline of this species.

Black Terns are semicolonial, establishing colonies usually consisting of fewer than 20 pairs and rarely more than 100 (del Hoyo 1996b). They often return to their natal colony to nest. Nesting occurs in dense emergent vegetation where 25-75 percent of the surface is covered with flooded emergent vegetation (cattails, bulrushes), although not so dense as to prevent a canoe from being forced through it (Dunn and Agro 1995). A nest is "assembled" by collecting masses of floating vegetation from surrounding water onto a pile. Nests may be constructed on a clump of dead reeds, cattail root-stalks, floating boards, or muskrat (*Ondatra zibethicus*) houses. The nest is usually located within 0.5-two metres of open water. The site may have dead snags, shrubs or posts for roosting. The nest is virtually at the water's surface, meaning that it may easily be destroyed by wind, wave action, or changing water levels. The water depth below the nest is usually 0.5-1.2 metres but may be less. The eggshells of Black Tern are unique and appear to be adapted to a moist nest environment (ibid.).

Nest success of the Black Tern is low, with usually only one chick raised per nest of two to three eggs. Nest success at Tiny Marsh appears to be much lower (see Holt et al., Appendix 3). Black Terns frequently re-nest, although if successful, they usually raise only one brood in a season. The nest site may be abruptly abandoned when the emergent

vegetation is altered by drought or flooding. These terns will vacate a site to choose another. One study observed that Black Tern can re-nest up to 42 kilometres away (ibid.).

The primary foods of Black Tern are dragonflies, damselflies, and other marsh insects taken on the wing. Other foods include small fish, crayfish, and molluscs, provided that they may be taken at the surface, for this tern rarely dives, preferring to immerse only its bill. Feeding may occur two to five kilometres from the colony at adjacent marshes or nearby meadows. Before pesticide use on agricultural lands, Black Terns were often observed foraging for insects behind ploughs and over grain fields. Ehrlich et al. (1986) suggest that in the upper midwestern United States, reduced hatching success may be due to agricultural contaminants. On wintering grounds along the coasts of central and South America, exposure to contaminants may be affecting the terns.

Black Terns are subject to several predators in their marsh habitat. Common Raven (*Corvus corax*), Northern Harrier (*Circus cyaneus*), and even large fish may prey upon adults. A variety of predators feed on chicks and eggs: Great-horned Owl (Bubo virginianus), Black-crowned Night-Heron (*Nycticorax nycticorax*), Great Blue Heron (*Ardea herodias*), Long-tailed Weasel (*Mustela frenata*), muskrats, minks (*Mustela vison*), Norway Rat (*Rattus norvegicus*), Northern Water Snake (*Nerodia sipedon sipedon*) and raccoons (*Procyon lotor*) (Dunn and Agro 1995, D.V. Weseloh, pers. comm. 2000). These terns can offer no defence against the mostly nocturnal predators listed above. Predators, particularly raccoons, may increase as the water level drops below 30 cm. Small colonies are subject to the highest levels of predation (del Hoyo 1996).

Wetlands managed for waterfowl are suitable for Black Tern colonies, provided that flooding or drawdowns do not negatively affect either emergent vegetation or nesting materials, and provided that water levels remain stable throughout the nesting season. Ducks Unlimited Canada, which manage water levels at Tiny Marsh and numerous other dyked wetlands, do not draw down wetlands with abundant emergent vegetation, but use drawdowns to stimulate vegetation growth in wetlands devoid of emergents (Dave McLachlin, pers. comm.). Black Tern will readily accept both artificial or restored wetlands provided the wetlands are biologically rich (Dunn and Agro 1995).

5.0 Other Elements of High Conservation Value

The Red-headed Woodpecker (*Melanerpes erythrocephalus*) is designated a Species of Concern nationally and Vulnerable provincially. During 1998-2000, two to three pairs were thought to have bred on site (Bowles, pers. comm. 2000). Le Conte's Sparrow (*Ammodramus leconteii*) is a former rare summer resident of Simcoe County (Devitt 1967). Several singing males were recorded on site in June 1999 (Cheskey, pers. comm. 2000). Trumpeter Swans from Wye Marsh have established a breeding population outside of Wye Marsh, including in Matchedash Bay.

Of 119 Priority Species of birds listed for Simcoe County (Bird Studies Canada 1999), 85 occur within the IBA in Matchedash Bay Wildlife Management Area (OMNR 1990), with evidence of breeding for about 60 species.

Noteworthy marsh-bird species inhabiting this IBA include Black-crowned Night-Heron (Nycticorax nycticorax), Sandhill Crane (Grus canadensis), American Coot (*Fulica americana*), Caspian Tern (*Sterna caspia*), Virginia Rail (*Rallus limicola*), American Bittern (*Botaurus lentiginosus*), Sedge Wren (*Cistothorus platensis*), and Marsh Wren (*Cistothorus palustris*). During spring and fall migration, as many as 25 species of waterfowl congregate in Matchedash Bay (ibid.). Large numbers of Canada Goose (*Branta canadensis*), Wood Duck (*Aix sponsa*), American Black Duck (*Anas rubripes),* Mallard (*Anas platyrhynchos*), Blue-winged Teal, Northern Pintail (*Anas acuta*), Green-winged Teal (*Anas crecca*), Ring-necked Duck (*Aythya collaris*), Greater Scaup (*Aythya marila*), Lesser Scaup (*Aythya affinis*), Bufflehead (*Bucephala albeola*), Common Goldeneye (*Bucephala clangula*), Common Merganser (*Mergus merganser*), and Hooded Merganser (*Lophodytes cucullatus*) have been recorded.

The assemblage of significant features in Matchedash IBA is impressive. Situated on the geological contact between the Canadian Shield and limestone bedrock of Southern Ontario, Matchedash Bay boasts plants and animals of both northern and southern affinities. The biological inventory includes 568 species of plants, 170 birds, 34 fish, 32 mammals, and 17 reptiles (ibid.). A provincially rare sedge, Spike-rush, *Eleocharis rostellata*, has been recorded, as well as many regionally rare wetland plants. The mozaic of vegetation cover types provides important habitat for this wide variety of plant and animal species. The provincially significant wetland in this IBA includes a dense cattail marsh and a coniferous wetland forest. Open water areas are productive, containing lush beds of submerged aquatic plants, emergent sedges, cattails, and important fish spawning and nursery habitats. Among the numerous species of mammals within the IBA are Black Bear (*Ursus americanus*), Moose (*Alces alces*), and River Otter (*Lutra canadensis*). Many species of reptiles and amphibians occur here: Pickerel Frog (*Rana palustris*), Blanding's Turtle (*Emydoidea blandingii*), Map Turtle (*Graptemys geographica*), Milk Snake (*Lampropeltis triagulum triangulum*), and Five-lined Skink (*Eumeces fasciatus*), a provincially Vulnerable reptile that is a Species of Concern nationally.

Matchedash Bay provides significant spawning, nursery, rearing, and foraging habitat for numerous species of fish (Dave McLachlin, pers. comm.).

The variety of wetland vegetation cover types and the shrub and tree stands along the edges of the wetlands provides food and cover for wildlife. Such vegetation also reduces both erosion and water evaporation as well as stabilizing shorelines, improving water quality, trapping sediments, retaining excess nutrients, removing bacteria, and immobilizing contaminants.

6.0 Land Ownership and Use

6.1 Land Ownership

This IBA site is primarily owned by the Ontario Ministry of Natural Resources and Ducks Unlimited Canada, with other public and private holdings adjacent to the Provincial Wildlife Area (see Figure 1).

6.2 Land Use

Historical

Archaeological findings, located adjacent to Matchedash Bay IBA, indicate that native people occupied this region as long ago as 7000-9000 B.P. Whether this occupation was continuous is not known. However, two archaeological sites indicate that the area was occupied during the Middle Woodland Period, 400-800 B.P. and more recently as seasonal hunting and fishing camps circa 400-500 years B.P. (OMNR 1990). European settlement began in the late 1700s when a trading post was established. Matchedash Bay was a significant and strategic point along the canoe route between Georgian Bay and Lake Simcoe. In 1793, the Governor of Upper Canada, John Simcoe, encamped near the trading post on an expedition to Matchedash Bay and Penetanguishene Bay, presently known as the Cowan site or "The Chimneys." (Dan Middleton, pers. comm. 2001).

Settlement of the region began with the surveying of the Penetanguishene Road between the north end of Lake Simcoe and Georgian Bay in 1811, and through treaty ceding the land to the British Crown. By 1830, the village of Coldwater was established along the Coldwater River just south of Matchedash Bay. By the mid-1800s, shipbuilding and lumber mills as well as farming and fishing were local occupations about the bay. Tugs, steamers, and sailing vessels moved cargo and people through Matchedash Bay to Midland and Penetanguishene from Coldwater. By the 1880s, a carriage works and a wagon and buggy plant were established as small industries in *Coldwater (Barrie Examiner*, 28 January 1971). Travel by road was beginning to replace transportation by water in the "north country."

Current

Management of Provincial Wildlife Areas falls within the jurisdiction of OMNR and the limitations imposed by the designation. The recreational value of Matchedash Bay has been recognized for a very long time. Agriculture, hunting, angling, trapping, boating, snowmobiling, and nature pursuits including bird watching and nature photography are major activities in and about the bay.

7.0 Conservation Management at Matchedash Bay IBA

Matchedash Bay is managed as a multi-purpose recreation area by MTM Conservation Association, a volunteer non-profit organization. MTM in partnership with the Ontario Ministry of Natural Resources and Ducks Unlimited Canada manages and maintains three provincial Wildlife Management Areas: Marl Lake, Tiny Marsh, and Matchedash Bay. The association cooperates with 18 affiliate organizations that include naturalists, anglers, hunters, hikers, photographers, canoeists, educators, agriculturalists, and dog-trainers, all of whom acknowledge that land management is best served by combining their efforts. MTM supports programs that benefit the natural resources and the environment. As well as the day to day management of the three Provincial Wildlife Areas, the association involvement ranges from school education programs, delivered by Bluewater Interpreters, to habitat management.

In 1996, Matchedash Bay was recognized as a Ramsar Site – a wetland of international significance and importance. The Ramsar Convention promotes the conservation and wise use of wetlands by national action and international co-operation as a means to achieve sustainable development throughout the world. The Ramsar Convention is the only global environmental treaty dealing with a particular ecosystem. As of July 2000, 121 nation states were signatories to the Convention, with 1028 wetland sites totalling more than 78 million hectares designated as wetlands of international importance (Ramsar 2000). Thirty-six wetlands in Canada have been designated Ramsar Sites: Minesing Swamp is the closest one to Matchedash Bay.

The Matchedash Bay IBA is delineated by the boundaries of the Matchedash Bay Wildlife Management Area. In 1981, the OMNR acquired 283 hectares in the southern portion of the IBA. This land is presently designated as a Wildlife Management Area (WMA) and as such, the Ontario Ministry of Natural Resources regulates all activities within it. In 1989, a detailed biological inventory of Matchedash Bay was undertaken and a management plan prepared with the intent of increasing the area of the WMA by about a factor of eight to almost 2,200 hectares (OMNR 1990).

Land acquisition in Matchedash Bay is a result of the North American Waterfowl Management Plan (NAWMP), an environmental agreement between Canada and the U.S. in 1986. The NAWMP committed these two countries to spending 15 years and an estimated $1.5 billion (Cdn) on conserving, enhancing, and managing key wetland ecosystems across North America. In 1994, Mexico became a full NAWMP member. The goal of the plan is to restore continental waterfowl populations to 1970s levels, exceeding 100 million waterfowl. The NAWMP recognizes waterfowl as the most economically important group of migratory birds on the continent. An estimated 30 million people observe, photograph, hunt, and appreciate waterfowl, resulting in direct expenditures of several billion dollars annually (North American Waterfowl Management Plan 2000).

In 1988, Matchedash Bay was selected as the first candidate project under NAWMP in Ontario and was identified as a First Step project area. Implementing the plan for the

acquisition, enhancement, and management of wetland habitat for waterfowl in Matchedash Bay is OMNR, Ducks Unlimited Canada, the Nature Conservancy of Canada and the Canadian Wildlife Service. These agencies operate under the Eastern Habitat Joint Venture (EHJV) partnership. Although initially established as a 15-year venture, it has been acknowledged since the first review of the plan in 1993-94 that completion of the NAWMP objectives would take at least until 2010.

Ontario has 23 percent of the total of Canadian wetlands, more than any province or territory. In 1993, a strategic plan, the Great Lakes Wetlands Conservation Action Plan (GLWCAP) involving several public and private agencies, was launched. Its purpose was to protect the area and function of 30,000 hectares of existing wetlands in the Great Lakes basin. This mandate extends until 2020. This action plan complements the goals and objectives of the Federal Wetlands Policy (1991) and the Ontario Wetlands Policy Statement (1992). Matchedash Bay is identified as a securement project under GLWCAP and, to date, 76 hectares of land have been acquired (GLWCAP 2000). The implementation of GLWCAP is by representatives from Environment Canada, the Ontario Ministry of Natural Resources, the Federation of Ontario Naturalists, the Nature Conservancy of Canada, EHJV of North American Waterfowl Management Plan, and the Great Lakes Sustainability Fund.

Matchedash Bay lies within the Severn Sound watershed, an area of 1,000 square kilometres. Approximately 40 percent of this watershed drains through Matchedash Bay. Since the 1960s, Severn Sound has had problems with poor water quality resulting from excessive algal growth, a response to an oversupply of the nutrient phosphorus. The International Joint Commission, the agency responsible for issues concerning the Great Lakes, identified Severn Sound as one of 43 Areas of Concern with respect to water pollution. In response to this concern, the Severn Sound Remedial Action Plan (SSRAP) was developed in 1993 to restore the water quality of the Severn Sound watershed and hence a healthy environment (Severn Sound Information Sheet 2000). SSRAP has achieved much toward this and has every reason to believe that Severn Sound will be de-listed as an Area of Concern in the near future. In 1997, the Severn Sound Environmental Association (SSEA) was founded in recognition that achieving and maintaining the watershed as a healthy ecosystem will be an ongoing community activity. The wetlands of Matchedash Bay will assume a significant role in the maintenance of water quality, and its biodiversity of plants and animals will be a reflection of the success of this program.

Portions of Matchedash Bay have been designated as Provincially Significant Wetlands and both Provincially Significant and Locally Significant Life Science Areas of Natural and Scientific Interest (ANSI). A significant wetland is an area identified as provincially significant by the Ministry of Natural Resources using evaluation procedures established by the province, as amended from time to time (Provincial Policy Statement Definition). Provincially Significant Life Science ANSIs are the most significant and best 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. Municipalities are encouraged to protect provincial ANSIs and Provincially Significant Wetlands through Official Plans.

Recognizing the need to rejuvenate and restore wetlands in Ontario, Ducks Unlimited Canada (DUC) began its operation in Ontario in 1975. Matchedash Bay was recognized as crucial habitat for waterfowl. Within this IBA, DUC undertakes water level management of the north and south beaver ponds and the Thiffault and Brereton Cells. Efforts to provide and improve nesting cover for waterfowl has prompted DUC to plant prairie grasses in drier upland sites within the IBA. In fact, the presence of Bur Oaks interspersed among open spaces of herbaceous ground cover suggests that a remnant prairie-savanna community exists (Holt 1999). Prescribed burns are undertaken to maintain and restore prairie savanna conditions. The most recent took place in spring of 2000. As well, a botanical inventory will be undertaken to assess the site for a prairie restoration project.

8.0 Stakeholders

The following are the major stakeholders within this IBA. There are undoubtedly other stakeholders that are not mentioned. The authors regret any omission and recognize that many other groups have interests in Matchedash Bay.

MTM Conservation

MTM Conservation Association, a volunteer non-profit organization, manages and maintains three provincial Wildlife Management Areas, Matchedash Bay, Tiny Marsh, and Marl Lake, in partnership with the Ontario Ministry of Natural Resources and Ducks Unlimited Canada. MTM provides leadership, education, management, and maintenance for these areas.

Coldwater Conservation Association

Based out of Coldwater, this club has actively undertaken conservation projects in Matchedash Bay wetlands and has been actively involved in habitat management projects. Members of the club hunt and fish in Matchedash Bay.

Ducks Unlimited Canada

Ducks Unlimited Canada (DUC) is a charitable non-governmental organization with a long and effective history of wetland conservation and restoration. DUC owns land within the IBA and manages the dyked wetlands through agreement with the MNR.

Ontario Ministry of Natural Resources

Owner of much of the land base, this provincial agency is ultimately responsible for the management activity within much of this IBA.

Local residents

There are many permanent and seasonal residences adjacent to and near Matchedash Bay. Waubaushene and Coldwater are the towns within close proximity. Residents use Matchedash Bay for a wide range of recreational activities.

Township of Severn

This is the municipality in which the IBA resides. The Township regulates land use through a Zoning Bylaw within its Official Plan.

Field Naturalist Clubs

Three Field Naturalist clubs exist within 40 minutes of the IBA: the Orillia Field Naturalists, the Penetang/Midland Field Naturalists, and the Brereton Field Naturalists. Matchedash is a popular destination for nature observation by these clubs. Members were instrumental in undertaking monitoring of Least Bittern in 2000 and establishing protocols for future monitoring (see Appendices 2 and 3).

Severn Sound Environmental Association

The Severn Sound Environmental Association (SSEA) was founded on the recognition that ongoing community involvement in the development of the Severn Sound Remedial Action Plan (SSRAP) was required to achieve and maintain the watershed as a healthy ecosystem. The SSEA involves seven municipalities, non-governmental groups, and federal and provincial agencies. This association is regarded as a model for implementing remedial action plans operating around the Great Lakes.

9.0 Opportunities

IBA marsh bird species such as Least Bittern, King Rail, and Black Tern require habitat found in a productive, healthy marsh. The human inhabitants of Severn Sound have demonstrated in their efforts through the SSRAP that they take the health of their watershed seriously and respond with commitment and enthusiasm to achieving the goals of the plan. Since the Joint International Commission identified 43 Areas of Concern along the Great Lakes, only one site, Collingwood Harbour, Ontario, had been de-listed. Severn Sound may well be the second one.

Undoubtedly the IBA marsh bird species in Matchedash Bay will be acknowledged and identified as bio-indicators of the health of not only Matchedash Bay but also the Severn Sound watershed itself. The IBA species are indeed the “canaries in the mine.” In 2000, with assistance through the IBA Community Action Fund, a group of dedicated volunteer naturalists undertook to establish protocols and begin monitoring populations of Least Bittern and Black Tern at Matchedash Bay and Tiny Marsh. The results of the work are presented in Appendices 2 and 3.

The Gartner Lee 1990 report on Matchedash alluded to a potential need to consider creating favourable Black Tern habitat in dyked wetlands in response to changing water

levels (e.g., drought) in the main marsh that render habitat unsuitable for nesting. Low water levels in the late 1990s appear to have resulted in many fewer Black Terns in Matchedash Bay. Managing one of the cells to promote Black Tern habitat may help to bring back the terns.

Presently Tiny Marsh IBA and Wye Marsh IBA offer facilities, programs, and opportunities to observe many of the same species found in Matchedash Bay IBA. Given the proximity of Tiny and Wye, limiting access to Matchedash would minimize disturbance to birds. However, a relatively common theme of stakeholders is the desire to have better access to Matchedash for birding. Both objectives could be achieved by:

a) better information and communications about existing access points rather than creating new access, and

b) enhancement of facilities at these points.

One observation tower exists at Matchedash Bay, offering limited views of a swamp wetland. A viewing mound provides views opposite the main marsh. A second tower or blind overlooking the marsh could greatly enhance observation opportunities. Some naturalists presently access the marsh by canoe. More accessible information about access points, canoe rentals, observation locations, and seasonal restrictions on access may attract more birders and naturalists, which could lead to better information about birds. This information is presently available in the Matchedash Bay Provincial Wildlife Area Trail Guide (Fletcher, pers. comm. 2001).

Field work is about to begin for the second Atlas of Ontario Breeding Birds. This project should result in a concerted effort to document the breeding birds, and produce repeatable quantitative counts of their abundance. It may also mobilize volunteers to greater levels of involvement in bird study, conservation, and stewardship.

10.0 Threats

10.1 Sedimentation

Sedimentation as a result of agricultural practices such as row cropping has been identified as a threat that may degrade the wetlands of Matchedash Bay. Controlling livestock access to waterways may reduce sedimentation.

10.2 Invasive Exotic

Non-native fauna and flora are a major threat to the health of any freshwater ecosystem (Naiman et al. 1995). In the Great Lakes Basin, over 130 of these exotic species have become established, in many instances bringing about irreversible and detrimental consequences (Wittman 1999). Plants such as Purple Loosestrife, Phragmites, and European Frogbit continue to invade and thrive in wetlands throughout Ontario. Dense stands of these invasive species choke out native wetland species that may be important foods for wildlife and fish. Purple Loosestrife is present in open upland and open wetland communities at Matchedash. At present there is no special effort to control or eradicate this species, although DUC has undertaken Loosestrife control measures in the past.

The accidental introduction of Zebra Mussels into the Great Lakes has had dramatic impacts on fish and water birds. A filter feeder, this mussel is capable of filtering a litre of water per day and removing most single-celled organisms that live suspended in a lake (Wittman, 1999).

Carp are abundant in Matchedash Bay. Their feeding and mating behaviour increases turbidity, which may indirectly reduce growth of submergent vegetation important for waterfowl and many marsh birds. Such behaviour can even result in egg loss or nest desertion by Black Terns (Dunn and Agro 1995). On the other hand, young carp are a significant food source in the marsh community for Osprey, Bald Eagle, and several species of wading birds as well as predacious fish such as bass and northern pike.

Mute Swan populations are increasing in Great Lakes coastal marshes. This Asian species is very aggressive during nesting periods and will chase and attack native species, including grebes and waterfowl, driving them out of its territory (S. Petrie, pers. comm. 1999). At present, this species is not present in Matchedash Bay.

10.3 Lead shot and sinkers

Lead sinkers and jigs are a potential problem to nesting Trumpeter Swans. Ingestion of lead shot, first recognized at Wye Marsh in 1991, has resulted in illness and even death of several Trumpeter Swans and has been identified as a critical threat at Wye Marsh. The lead shot in the sediment remaining from pre-1993 hunting seasons has been of long-term concern. Dabbling ducks, geese, and swans ingest the shot and fishing sinkers for use as grit or food, as they are similar in size and shape to plant seeds. Swans

with their long necks are able to reach into sediments unavailable to other waterfowl. Trumpeter Swans from Wye Marsh are gradually establishing a regional breeding population outside of Wye, including at Matchedash Bay. Lead shot that has accumulated after years of hunting may present a threat to resident Trumpeter Swans which can continue for decades.

10.4 Disturbance

Matchedash coastal marshes are accessible by boat under average water conditions. Disturbance of marsh habitat during the nesting season (May-July) can be disastrous to sensitive species such as Black Tern.

10.5 Loss of wetland habitat

Almost 70 percent of the Ontario wetlands south of the Precambrian Shield have been lost since pre-settlement times. Drainage for agriculture and hardening of Great Lakes coastal areas are two of the major causes of habitat loss. In addition to loss of wetland habitat, many of Ontario's best marshes are in lockup, old and filled with dense stands of emergent vegetation, usually cattails that accumulate most of the marsh nutrients (Pittaway 1997). With very few, if any, areas of open water within a marsh, species of marsh birds are few in number or entirely absent. Coastal marshes tend to lock up, due to fairly constant water levels in the Great Lakes. This problem is exacerbated by global warming and dropping lake levels. Matchedash Bay is subject to water level fluctuations associated with Georgian Bay.

Two dyked cells (Thiffault and Brereton) within the IBA are managed by Ducks Unlimited Canada. In addition to these cells, the north and south beaver ponds also have full water control capabilities (McLachlin, pers. comm. 2001). These managed cells provide hemimarsh conditions with an interspersion of 50 percent vegetation and 50 percent open water, which provides habitat for a diversity of marsh birds.

11.0 Conservation Action Plan

The following action plan lays out the basics for bird conservation in the Matchedash Bay Important Bird Area. The vision, goals, and objectives were developed over several meetings with the IBA Steering Committee. Bulleted strategies or actions follow each goal and objective. It will be in the interest of the Steering Committee and stakeholders to prioritize these goals, objectives, and actions. MTM Conservation Association, the group responsible for management of Matchedash Bay, will oversee implementation, which will depend on the availability of resources and people. The suggested group or person responsible for implementation is listed in brackets, followed by the Action's priority: H=high, M=moderate, L=low.

The organizations and groups suggested as leading certain actions are as follows:

MTM	MTM Conservation Association
CNF	Canadian Nature Federation
CWS	Canadian Wildlife Service
DUC	Ducks Unlimited Canada
FON	Federation of Ontario Naturalists
MNR	Ontario Ministry of Natural Resources
CCA	Coldwater Conservation Association
SSRAP	Severn Sound Remedial Action Plan
BSC	Bird Studies Canada

Vision

The Matchedash Bay Important Bird Area will be conserved and managed to protect, restore, and enhance populations of resident and migratory birds, as a place where birds can be monitored, studied, and enjoyed for the, ecological, educational, and economic benefits to the people of Severn Township and beyond.

Goals, objectives, and actions

1. *Protect and conserve significance of Matchedash Bay for Black Tern, Least Bittern, King Rail, and other marsh birds*

    a) Manage marsh conditions that provide suitable habitat to Least Bittern and Black Tern
        - Manage water levels in the Thiffault and Brereton Cells to obtain suitable conditions for Least Bittern and Black Tern (hemimarsh conditions) (DUC, MTM) (ongoing)
        - Create conditions with a variety of water depths to maximize habitat diversity for wading birds, while not compromising Objective "a." (DUC, MTM) (ongoing)

    b) Protect habitat of species of concern during breeding season

- Develop a management plan for Matchedash Bay Provincial Wildlife Area that identifies habitat management goals for the area and protects sensitive portions of the area through zoning (e.g., sanctuary), signage, seasonal access limitations, and education (MNR, MTM, DUC, all stakeholders) (H)

2. *Undertake monitoring and research on species of concern*

   a) Develop surveys and monitoring protocols to determine populations of Least Bittern and other significant species, and tract these populations over time

      - Establish volunteer-based monitoring system to track species of concern (e.g., Least Bittern, Black Tern, King Rail, LeConte's Sparrow, Yellow Rail) (MTM, CWS, Atlas, DUC, BSC, naturalist clubs) (ongoing)
      - Coordinate efforts through the Ontario Breeding Bird Atlas to add to knowledge of the birds of Matchedash Bay (MTM, naturalist clubs, atlas regional coordinator) (H)
      - Coordinate activities with Wye Marsh Wildlife Centre with regards to monitoring of Trumpeter Swans in Matchedash Bay (MTM, DUC) (M)

   b) Develop a database of all relevant information on birds at Matchedash Bay

      - Find an appropriate location for storing data (MTM, DUC) (M)
      - Share data on significant species with the Natural Heritage Information Centre (MTM, DUC) (H)

3. *Protect adequate habitat in sanctuary for waterbirds and waterfowl*

   a) Develop habitat management objectives for Matchedash Bay Provincial Wildlife Area that protect sensitive areas through zoning (e.g., sanctuary), signage, seasonal access limitations, and education

      - Develop and implement management plan (MNR, MTM, DUC, all stakeholders) (H)
      - Define with stakeholders how much habitat for sanctuary is adequate for waterfowl and waterbirds (H)

4. *Develop communication strategies and actions to promote bird conservation among partners, stakeholders, and the public*

   a) Hold public events to recognize the IBA and its value to birds and wildlife.

      - Hold a dedication ceremony (MTM, DU, CNF, FON) (M)
      - Install an IBA dedication plaque on site (MTM, DU, FON, CNF) (M)

   b) Develop print materials that support the IBA

- Produce a "Birds of Matchedash" checklist (MTM, naturalist clubs, OFO) (M)
- Make Matchedash Bay Provincial Wildlife Area Trail Guide more accessible to a wider range of users. (MTM) (M)

5. *Assess and address the issue of habitat degradation, and develop a plan to mitigate losses and restore habitat*

   a) Promote through the Severn Sound RAP and the municipal planning process habitat restoration and land stewardship in the watersheds that drain into Matchedash Bay

      - Work with private landowners and agencies to exclude livestock along all watercourses draining into Matchedash Bay (SSRAP) (ongoing)
      - Work with private landowners and Stewardship Council to promote agricultural practices that reduce/minimize potential for wind and water erosion (e.g., cover crops, no till) (SSRAP) (ongoing)

   b) Restore, maintain, and enhance natural habitats within the IBA

      - Develop techniques for managing coastal marsh in "lockup" stage to release nutrients and introduce plant diversity (such as through controlled burning) (MNR, MTM, DUC, SSRAP) (ongoing)
      - Undertake plantings and maintenance activities such as prescribed burns and or mowing to restore or create prairie, savanna, wet meadow, and fen habitat conditions (DUC, MTM, MNR) (ongoing)

   c) Identify and monitor sources or potential sources of toxic pollution within the IBA

      - Work with the Severn Sound RAP to continue efforts to "get the lead out" of the watershed (SSRAP, MTM, DUC, CCA) (M)

6. *Facilitate public opportunities and access to appropriate sites for observation of waterbirds, waterfowl, and landbirds*

   a) Develop ways to enhance visitor access to Matchedash Bay IBA without compromising or threatening breeding, resting, or feeding waterbirds, waterfowl and landbirds.

      - Develop and implement management plan (MNR, MTM, DUC, all stakeholders) (H)
      - Improve directional signage to trailheads (MTM, DUC, MNR) (H)
      - Consider construction of a second observation tower or blind overlooking the marsh (MTM, DUC, CCA, MNR) (M)
      - Develop a picnic shelter at an appropriate location (MTM, CCA) (M)
      - Limit access to few sites (MTM, DUC, CCA, MNR) (H)

- Work with local marinas/outfitters to facilitate water access (MTM, DUC, CCA, MNR) (M)

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.

MTM, along with other stakeholders, will oversee implementation of these actions. As a first step, MTM and other partners should establish priority actions and develop a timeframe for implementation. During the summer of 2000, a good step was taken to establish monitoring protocols and undertake research on Black Terns and Least Bitterns (see appendices 2 and 3). Continuation of these activities and implementation of others will depend on availability of resources and the interests and energy of the stakeholders. An annual update on the conservation plan implementation would be of great value to the CNF, FON, and BSC.

As Matchedash Bay IBA has joined the global family of IBAs, information on the IBA will be incorporated into BirdLife's global IBA database. This database will be used to report on conservation progress in IBAs. The information of most value for the database is listed below.

- summary of general progress by the stakeholders group
- update on actions, objectives, and goals
- changes in actions, objectives, and goals (explain why changes were needed)
- 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

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Appendix 1. IBA Program Partners

BirdLife International

A pioneer in its field, BirdLife International (BL) 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 programmes. These organizations provide a link to on-the-ground conservation projects that involve local people with local expertise and knowledge. Currently 20 countries are involved in the Americas program throughout North, Central, and South America. For further information about BirdLife International, check the following web site: 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

The Canadian Nature Federation (CNF) 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 our provincial, territorial, and local affiliated naturalists' organizations to directly reach 100,000 Canadians. The strength of our grass-roots naturalists' network allows us 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. Our approach is open and cooperative while remaining firm in our goal of developing ecologically sound solutions to conservation problems. CNF's web site is http://www.cnf.ca.

Bird Studies Canada

The mission of Bird Studies Canada (BSC) 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 web site is http://www.bsc-eoc.org/.

Federation of Ontario Naturalists

The Federation of Ontario Naturalists (FON) 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 web site is http://www.ontarionature.org.

Appendix 2. Least Bittern Survey, Tiny Marsh and Matchedash Bay

The Least Bittern (LEBI) is a small, shy member of the heron family. COSEWIC (Committee On The Status Of Endangered Wildlife In Canada) lists the Least Bittern as a species of Special Concern. The low numbers of Least Bitterns in Ontario are primarily the result of loss of wetland habitat.

A monitoring program for Least Bitterns was conducted at Tiny Marsh & Matchedash Bay between May 29 to June 19, 2000. There were two monitoring routes at both sites. Each route consisted of 10 observation/listening stations placed approximately 250 metres apart in suitable habitat. At each station tape-recorded calls of Least Bittern were used to aid in detection. Three surveys approximately a week apart were conducted on each route. The results are shown in the table below.

	TINY MARSH West Cell	TINY MARSH South/East Cell	MATCHEDASH BAY Brereton Cell	MATCHEDASH BAY Thiffault Cell
SURVEY 1 May 29 – Jun 2	0 no LEBI seen or heard	0	0	5
SURVEY 2 Jun 5 – Jun 8	1	2	5	10
SURVEY 3 Jun 12 – Jun 19	2	3	6	5
DOMINANT VEGETATION	Bullrush, Cattail (*Scirpus, Typha*)	Cattail, Bullrush, Sedge (*Typha, Scirpus, Carex*)	Cattail (*Typha* spp.)	Cattail (*Typha* spp.)
WATER DEPTH	15 – 92 cm	15 – 77 cm	14 – 39 cm	0 – 11 cm

This year the main marsh at Matchedash Bay experienced very low water levels due to low levels in Georgian Bay/Lake Huron. It was interesting to observe the difference in green-up between the main marsh & the Brereton Cell on June 7. New cattail growth was seen throughout the Brereton cell showing a 99 percent green-up. The main marsh area was still mostly brown with very little new cattail growth: only 10 percent green-up. Also birdsong and activity was much greater in the Brereton Cell than in the main marsh area.

Three teams conducted the Least Bittern surveys. At Tiny Marsh Andy Fletcher and Melanie Radder looked after both routes. The Brereton Cell at Matchedash Bay was surveyed by Sid and Dorothy Hadlington and Margo Holt. Pat and Jim Woodford surveyed the Thiffault Cell at Matchedash Bay, which appears to be the Least Bittern capital with a high of 10 birds.

Margo Holt

Appendix 3. Final Report by the MTM-IBA Committee

Citation:
Holt, M & J. Broadfoot. 2000. *Least Bittern & Black Tern Monitoring Report for Tiny Marsh & Matchedash Bay Provincial Wildlife Areas.*
M-T-M Conservation Association

Abstract: Field studies were conducted to assess Black Tern (*Chlidonias niger*) and Least Bittern (*Ixobrychus exilis*) populations at Tiny Marsh and Matchedash Bay. Point count data were collected for Least Bittern at Matchedash Bay (Thiffault and Brereton cells) and at Tiny Marsh between May 29 and June 19. LEBI point counts were lowest at Tiny Marsh (0.133 responses/station) and highest at Thiffault (0.667 responses/station). Point count responses were intermediate at Brereton (0.367 responses/station). Black Tern point counts were conducted only at Tiny Marsh. An average of 5.28 adult Black Terns was observed during six surveys conducted between June 12 and July 27. Point count data collected during four surveys between July 18 and July 27 indicated a ratio of 8.5 flying juveniles per 100 adult Black Terns. Black Tern nest surveys conducted in six sections of Tiny Marsh between June 10 and June 18 resulted in a count of 95 nests and 432 flying adults. An average of 2.32 eggs was observed per Black Tern nest. The implications of these results and plans for future data gathering are discussed.

Introduction

Black Tern (BLTE) and Least Bittern (LEBI) surveys were conducted at Tiny Marsh and Matchedash Bay during the year 2000 field season. Both of these birds are species of conservation concern – BLTE, listed as vulnerable in Ontario by COSSARO and not at risk nationally by COSEWIC in 1996; LEBI, listed as nationally vulnerable by COSEWIC in 1988. Consequently the MTM Conservation Association has great interest in developing methods to monitor their abundance and distribution. Black Tern surveys have been conducted in the past at Tiny Marsh, first by MNR and then by volunteers from MTM. These surveys related to counts of flying adults made in June during most years. Observers traversing habitat in canoes counted flying terns. Sampling effort varied in terms of areas of the marsh surveyed and the number of observers. No similar BLTE surveys were conducted at Matchedash. Information on LEBI was not gathered according to any formal protocol.

During the 1999 summer field season researchers from the Canadian Wildlife Service conducted a series of feasibility studies at Tiny Marsh related to BLTE nesting success. Results from this study indicated what appeared to be a relatively low nest success (percentage of young reaching fledgling age). High levels of predation by Northern Water Snakes (*Nerodia sipedon sipedon*) and gulls (*Larus* spp.) was suggested as a possible explanation (Weseloh, pers. comm.). About this time, MTM became involved in

the Important Bird Areas (IBA) conservation planning process. Associated with this IBA process was the planning of field surveys of BLTE and LEBI to be conducted at Tiny Marsh and Matchedash Bay. The field surveys were designed to provide results that were reproducible over time and collected with consistent sampling intensity. This was seen as being important in terms of using data to assess trends in abundance. Additional surveys were designed to assess BLTE recruitment (ratio of flying young to adults). This later survey was seen as valuable in light of the results of CWS nest success studies conducted in 1999 indicating a relatively low survival rate of young BLTE.

This report presents the methods and findings of BLTE and LEBI field studies conducted at Tiny Marsh (both BLTE and LEBI surveys) and Matchedash Bay (LEBI surveys only) during the year 2000 field season.

Acknowledgments

The following volunteers helped with this years BLTE surveys: Margo Holt, Pat Woodford, Jim Woodford, Sid Hadlington, Dorothy Hadlington, Andy Fletcher, Betty Macpherson, Jim Macpherson, Jim Forest, Barry Chapman, Kip Campbell, Melanie Radder, and Jim Broadfoot. Three teams conducted the LEBI surveys as follows: Andy Fletcher and Melanie Radder at Tiny Marsh; Sid and Dorothy Hadlington along with Margo Holt at the Brereton Cell, Matchedash Bay; and Pat and Jim Woodford at the Thiffault Cell, Matchedash Bay. Thanks to all!

Methods

Study Areas

Surveys were conducted at Tiny Marsh (44°36' N, 79°56' W) and Matchedash Bay (44°40' N, 79°45' W).

Tiny Marsh is comprised of cattail and meadow marsh communities interspersed with open water. Water levels at Tiny Marsh are managed by Ducks Unlimited Canada. Water levels can be manipulated independently in three dyked cells. All cells were flooded during surveys. The surrounding upland habitat was approximately 50 percent agriculture. Thirty percent of the landscape was forested. Matchedash Bay represents a large and diverse wetland subject to water level fluctuations associated with Georgian Bay (long-term water level fluctuations and short-term, wave induced “flooding”). Field studies were conducted in dyked cells (Thiffault and Brereton) managed by Ducks Unlimited Canada. Both cells were under flood conditions at the time of surveys. Water levels in the main marsh were low. The surrounding upland habitat at Matchedash presented about 50 percent forest cover. Agriculture was present but was practised on less than 20 percent of the landscape.

Both study areas lie within the Manitoulin-Lake Simcoe ecoregion. This ecoregion experiences warm summers and mild winters, with a mean summer temperature of

16.5°C and a mean winter temperature of -4.5°C. The region receives about 750 to 1,000 mm precipitation which is evenly distributed through the year. Prevailing winds from the west and northwest in winter result in the development of "lake effect" snowfalls that result in significant snow accumulations particularly during early winter.

The region was submerged under glacial Lake Algonquin during the recession of the Wisconsin Ice Age (about 10,000 years ago). Soils reflect the regions geological history: the carbonate-rich soils were developed from the underlying limestone parent material (bedrock); the clays and silts are a result of glacial lake formation and recession; and the accumulated organic matter is a product of its more recent history as marshland.

Survey Techniques

Point Counts

A monitoring program for LEBI was conducted at Tiny Marsh and Matchedash Bay between May 29 to June 19, 2000. There were two monitoring routes at both sites. Each route consisted of 10 observation/listening stations placed approximately 250 metres apart in suitable habitat. At each station tape recorded calls of LEBI were played for three minutes (3-15 second recordings of LEBI calls separated by 45 second intervals). Call responses were listened for during a two-minute period. The number of LEBI seen or heard was recorded. Three surveys, approximately a week apart were conducted on each route between May 29 and June 19.

Point counts were also used to sample BLTE at Tiny Marsh. We used the same point count stations that were set up to sample LEBI. The point count method employed 20 stations set up with a minimum distance of 250 metres between them. The number of terns observed within a semi-circle of 100 m radius from the station were counted for a period of five minutes. The point counts were done on June 12 and 13 and July 18, 19, 26, and 27. Point counts conducted in July were used to sample both flying adults and juveniles (to be used as an index of recruitment). Note: Casual observation of flying young and adult BLTE were conducted from Tiny Marsh's dyke system on July 24 and 29.

The following information was collected once at each point count station: water depth, average vegetation height, average stem density, and species composition of most abundant plants (Table 1).

Black Tern Nest Survey

Tiny Marsh was surveyed intensively by crews of two observers using canoes between June 10 and 18. The marsh was segregated into six sampling areas, and one crew was assigned to each area. Observers recorded the total number of flying adult BLTE seen within their sampling area and the number of nests and eggs per nest. Maps were provided so observers could mark the location of nests.

Data Analysis

Field data were entered to digital files using Microsoft Excel (Version 7.0). The Excel workbook BLTE_Point_Count_2000.xls contains BLTE point count and nest survey data while the workbook file LEBI_Point_Count_2000.xls contains LEBI point count data. Summary data and parametric statistical tests were done using Excel. Non-parametric statistical tests were done using NCSS 97.

Frequency plots of data were inspected for correspondence to a normal distribution. Those data that conformed to "normality" were analysed using standard parametric statistical techniques. Those data that were clearly not normally distributed were analysed using non-parametric procedures – the Mann-Whitney U test for differences among medians. Statistical tests were evaluated using $\alpha = 0.05$ as the rejection criteria (i.e. tests with $P > 0.05$ were assumed not significant).

Table 1. Habitat and water conditions at point count stations used to assess BLTE and LEBI populations at Tiny Marsh and Matchedash Bay during year 2000 field surveys.

Location	Point Count Station #	Water Depth - cm	Vegetation Height - cm	Stem Density (#/sq.m)	Species
Tiny Marsh	1	61	0-91	<100	White and yellow waterlily, bulrush
Tiny Marsh	2	91	0-91	<100	Yellow waterlily, cattail
Tiny Marsh	3	60	0-60	<100	Cattail, yellow waterlily
Tiny Marsh	4	46	0-91	<100	Pondweed, white waterlily, bulrush
Tiny Marsh	5	60	0-60	<100	Pondweed, white waterlily, bulrush
Tiny Marsh	6	46	0-20	<100	Pondweed, pickerelweed
Tiny Marsh	7	31	0-91	<100	Bulrush, ywllow waterlily, pondweed
Tiny Marsh	8	60	0-60	<100	Pondweed, bulrush
Tiny Marsh	9	60	0-90	<100	Pondweed, bulrush
Tiny Marsh	10	15	0-60	<100	Bulrush, sedge, pondweed
Tiny Marsh	11	31	0-46	<100	White waterlily, grasses
Tiny Marsh	12	15	60	>100	Grasses
Tiny Marsh	13	15	0-51	<100	Grasses/sedges, yellow waterlilly
Tiny Marsh	14	60	0-91	<100	Cattails, white waterlily
Tiny Marsh	15	60	0-60	<100	Bulrush, white waterlily, pickerelweed
Tiny Marsh	16	60	0-91	<100	Cattail, white waterlily
Tiny Marsh	17	60	0-122	<100	Pondweed, cattail
Tiny Marsh	18	76	0-91	<100	Bulrush, cattail, white waterlily
Tiny Marsh	19	60	0-91	<100	Cattail, white waterlily
Tiny Marsh	20	60	0-91	<100	Cattail, white waterlily
Brereton	11	21	water	NA	Cattail – 15 m across
Brereton	12	14	170	>100	Cattail
Brereton	13	14	190	62	Cattail
Brereton	14	30	water	>100	Cattail
Brereton	15	39	water	>100	Cattail
Brereton	16	18	200	>100	Cattail
Brereton	17	18	water	NA	Cattail – 15 m across
Brereton	18	28	water	NA	Cattail – 15 m across
Brereton	19	0	91	>100	Cattail
Brereton	20	0	65	>100	Cattail
Thiffault	1	8	100	34	Cattail (Typha x glauca)
Thiffault	2	8	70	5	Cattail (Typha x glauca)
Thiffault	3	10	0	0	Grasses
Thiffault	4	1.5	170	30	Cattail
Thiffault	5	7.5	200	50	Cattail
Thiffault	6	11	100-200	40	Cattail
Thiffault	7	0	100-160	8	Mostly dead vegetation
Thiffault	8	0	150	30	Same as station # 7
Thiffault	9	0.5	150	40	Grass, cattail
Thiffault	10	0.1	150	20-40	Cattail, grass

Results of Black Tern Surveys at Tiny Marsh

BLTE Nest Survey

Tiny Marsh was segregated into six sections to conduct nest surveys. Each section was surveyed once between June 10 and June 18. Surveys were conducted by groups of two volunteers using canoes.

A total of 432 flying BLTE and 95 BLTE nests was observed. A correlation was evident between the count of flying adult Black Terns and the number of nests found ($P < 0.05$, Figure 1). Data for this relationship were compiled for each cell sampled in the marsh ($n = 6$).

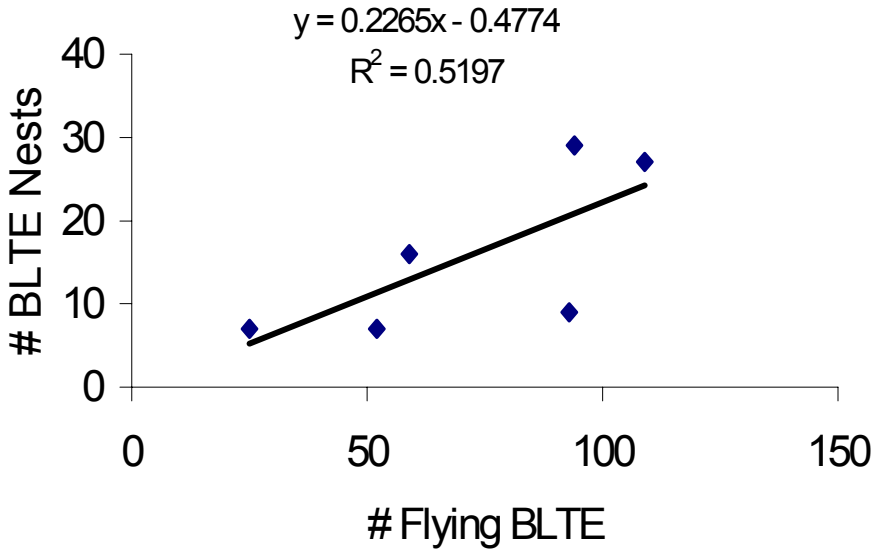

Figure 1. Relationship between counts of flying Black Terns and Black Tern nests observed during June 2000 canoe surveys.

We observed an average of 2.32 eggs/nest (SD = 0.890). The number of eggs per nest did not differ among the six sampling areas (ANOVA, $P = 0.4896$).

BLTE Point Count Survey

On average, 5.28 flying adult Black Terns were observed per station on six surveys conducted between June 12 and July 27 (SD = 4.551, n = 60, minimum = 0 , maximum = 22).

The July surveys were designed to sample flying juvenile Black Terns as well as adults. An average of 0.425 flying juvenile Black Terns was observed per station during four surveys conducted between July 18 and July 27 (SD = 0.7808, n = 40). During the same time period an average of 5.00 flying adults were observed per station (SD = 4.646, n = 40). These data indicate an average ratio of 8.5 juveniles per 100 adults (= 0.425/5.00 x 100). Casual observations made from Tiny Marshes dykes of flying adult and juvenile Black Terns on July 24 and 29 indicated a ratio of 52.5 juveniles per 100 adults.

Least Bittern, Tiny Marsh and Matchedash Bay

LEBI Point Count Survey

Tiny Marsh data indicated an average of 0.133 Least Bittern call responses per station (SD = 0.6687, n = 60, minimum 0, maximum 2). Least Bittern abundance appeared to be higher within the Thiffault cell at Matchedash Bay than at Tiny Marsh with an average call response of 0.667 per station (SD = 1.0613, n = 30, minimum = 0, maximum = 4) (Mann-Whitney U, P = 0.00163). No differences in call response were evident among Tiny Marsh and Matchedash Bay's Brereton cell (mean call response 0.367/station, SD = 0.6687, n = 30, minimum = 0, maximum = 2) (Mann-Whitney U, P = 0.0654) or among Matchedash Bay cells, Brereton, and Thiffault (Mann-Whitney U, P = 0.2406).

Discussion

Black Tern Surveys, Tiny Marsh

Year 2000's BLTE surveys at Tiny Marsh represented a significant move forward for MTM in terms of its approach to monitoring. By employing point count methods, MTM will be able to reproduce this year's results spatially (same stations used through time) and in terms of sampling effort. This will allow MTM to track changes in BLTE abundance over time. Segregating the marsh into six sections for the purposes of conducting flying adult and nest surveys and assigning a single crew of two observers to each section will help establish reproducible nest survey results with consistent effort as well. Again, MTM will be able to use yearly data as an index to BLTE nest abundance.

BLTE point count data proved to be reasonable for analysis in that very few observation sessions resulted in zero counts and the data showed a clear "central tendency" (contrast this with LEBI point count survey data, see discussion below). Consequently, summary data can be comfortably reported in terms of mean, standard deviation, etc., and data can be analysed using parametric statistical techniques. This statement applies most strongly to flying adult BLTE data. Minor "distribution" problems were observed for flying juvenile data collected in July (more zero count records).

The correlation between flying adults counted and the number of BLTE nests found was reasonably strong. In this approach to analysis we assumed that data from each sampling area represented an independent count. This is probably realistic, even though BLTE can easily traverse the entire marsh relatively quickly, since counts were made by observers on different days, flying adults counted were those that mobbed observers when they

neared nest sites (presumably local birds involved), the survey in each cell was only conducted once (no chance of learning to mob approaching survey crews based on past experience), and observers did not spend long in nest sites (low chance of drawing additional BLTE from other areas of the marsh). With additional years of data we will be able to assess differences in the ratio of flying adult BLTE to BLTE nests within different areas of Tiny Marsh. This information, when combined with habitat data, may shed light on conditions that represent low or high quality nesting habitat.

The interest in finding the relationship between flying BLTE and number of BLTE nests stems from a desire to be able to convert data collected in the past at Tiny Marsh as simply the number of flying adult BLTE to an estimate of number of nests. Also, the ratio of flying adults to nests may indicate either the strength of a given years breeding effort and/or an ingress/egress of BLTE to/from other wetlands. This year's estimate of the ratio of flying BLTE to nests was 4.55. The implication is that, like in most bird populations, there is a large pool of unmated adults in the population. The ratio of unmated BLTE may change for various reasons, including changes in marsh habitat (availability of suitable nest sites, changes in food availability, etc.), increases in local breeding population, and an influx of BLTE from other marshes. By tracking this ratio through time, MTM may be able to contribute to the understanding of BLTE nesting dynamics. Since some of the cells at Tiny Marsh are drawn down periodically, as part of Ducks Unlimited long-term marsh management, conditions exist to evaluate the response of BLTE to reduced nest site availability. Interesting questions emerge: Will the number of adult BLTE occupying the marsh during the breeding season decline and the proportion of the population breeding remain the same, or will the number of adult BLTE remain the same and the proportion breeding decline? Records of both flying adult BLTE and BLTE nests will allow understanding of these aspects of BLTE spatial behaviour and population dynamics.

The results of our BLTE recruitment study are interesting but difficult to evaluate. It appears that the marsh only recruited about 8.5 juveniles per every 100 adults into the population in mid-July 2000. With no comparative data, little can be made of this statistic other than to infer relatively heavy losses of BLTE during the egg stage, newly hatched stage, and/or pre-flight stage. This heavy loss was indicated during 1999 field surveys conducted at Tiny Marsh by the CWS (Weseloh, pers. comm.). Whether this level of recruitment is low and indicative of a declining population can be partly answered using an age-structured BLTE population model. The question to be asked of the model would be: is this level of recruitment sustainable given the rates of mortality expected in the adult population? It is not known if a suitable model exists or if the adult mortality data needed to run such a model are available.

Least Bittern, Tiny Marsh and Matchedash Bay

The year 2000 point count surveys represent MTM's first attempt to monitor LEBI populations at either Tiny Marsh or Matchedash Bay. Consequently, no local comparative data are available.

The point count method developed appeared suitable to the task in that LEBI responses were recorded. However, the number of responses at each station was typically zero. This presents considerable difficulty when attempting to analyse these data. The proportion of zero counts resulted in a highly skewed frequency distribution from which to derive descriptive statistics. This situation typically results when surveys are applied to sample items having relatively low abundance. It undoubtedly plagues point count sample designs applied to many relatively rare organisms. From an analytical standpoint, the implication of skewed distributions is failure of the assumption of normality, making invalid the application of parametric analytical procedures and description of central tendency and variance using the arithmetic mean and variance. At times, transformations applied to raw data result in a normal distribution. Common transformations applied to our data failed to "normalize" it. The result of all this is that the estimates of mean responses per point count station that we report are not strictly valid. We need to follow the lead of the current Breeding Bird Atlas group in terms of its analytical approach to point count data, since their data will also be problematic for some species.

Aside from the difficulties noted in the analysis/description of point count data noted above, our results do provide MTM with a starting point to the assessment of trends in LEBI and BLTE abundance. Data collected in 2000 were clearly robust enough for us to make conclusions related to the abundance of LEBI among sampling areas (even when using non-parametric tests). This result is encouraging and suggests that the point count approach has definite merit. A weakness of 2000's LEBI survey related to the quality of recordings. Observers all reported that recordings had poor quality and that tape players were inadequate. There is a definite need to purchase high quality recordings and players for the next field season.

Habitat Observations

In 2000, the main marsh at Matchedash Bay experienced very low water levels due to low levels in Georgian Bay/Lake Huron. It was interesting to observe the difference in green-up between the main marsh and the Brereton Cell on June 7. New cattail growth was seen throughout the Brereton Cell showing a 99 percent green-up. The main marsh area was still mostly brown with very little new cattail growth, only 10 percent green-up. Also bird song and activity was much greater in the Brereton Cell than in the main marsh area.