



Napanee Limestone Plain Important Bird Area Conservation Plan

Written for the
Steering Committee and
Stakeholders

August 2004



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Canadian Cattlemen's Association
Canadian Wildlife Service
Cataraqui Region Conservation Authority
Ducks Unlimited Canada
Eastern Loggerhead Shrike Recovery Action Group
Hastings Stewardship Council
Kingston Field Naturalists
Lennox and Addington Community Stewardship Council
Loyalist Township
Mohawks of the Bay of Quinte
Nature Canada
Ontario Ministry of Natural Resources
Ontario Nature-Federation of Ontario Naturalists
The Town of Greater Napanee
Township of Stone Mills
Township of Tyendinaga

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EXECUTIVE SUMMARY

The Important Bird Area (IBA) program is an international initiative coordinated by BirdLife International. It is a partnership of member-based organizations in over 100 countries that seeks to identify and conserve sites important to all bird species worldwide. There are currently IBA programs in Europe, Africa, the Middle East, Asia, and the Americas. In Canada, the co-partners are Nature Canada (NC) and Bird Studies Canada (BSC). Currently there are approximately 597 IBAs in Canada. Ontario Nature (ON) is responsible for delivering conservation planning for the Ontario IBAs. There are approximately 70 IBA sites in the province.

In keeping with overall IBA program objectives, conservation plans are developed through consultation with local stakeholders and a variety of different interest groups. A local steering committee provides input and direction and plays a key role in plan implementation for each IBA.

The Napanee Limestone Plain IBA is located just north of the Bay of Quinte, between the cities of Kingston in the east and Belleville in the west. It is a predominantly rural landscape of approximately 2000 km². The majority of the natural habitats are grasslands, most in early stages of succession.

The Napanee Limestone Plain IBA has been designated a nationally significant IBA under the threatened species and congregatory species categories. This IBA supports the endangered Loggerhead Shrike. Over the last 50 years, populations of this small bird have seriously declined throughout its North American breeding range. The Canadian population is very low; at most 100 pairs in three main widely separated areas: Quebec with perhaps 10 pairs of Loggerhead Shrikes; Ontario with about 40 pairs; and Manitoba with about 50 pairs.

This IBA provides important nesting, foraging, and roosting habitat for a variety of other grassland bird species of conservation concern including Upland Sandpiper, Clay-colored Sparrow, Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, American Kestrel, Common Nighthawk, and Eastern Meadowlark. In addition, the endangered Henslow's Sparrow has been present in low numbers.

There are also several good examples of rare vegetation communities known as alvars that support numerous provincially rare plant species.

Most of the land in the Napanee Limestone Plain IBA is privately owned and designated as rural residential. Land belonging to the Mohawk First Nations is located around the town of Deseronto, on the Bay of Quinte, east of the city of Belleville. There are several blocks of Crown land along Highway 401, various small Conservation Authority properties, and a Provincial Wildlife Management Area on Camden Lake.

The predominant land uses in the IBA are related to agriculture and residential housing. Most development is for residential housing. Industrial park development also occurs around several population centres. Beef, dairy, and cash crop production represent the main agricultural activities. The majority of farmers also work off the farm. Industries are confined to the major centres of Kingston, Belleville, and Napanee. Most tourism is also concentrated in and around these centres.

A major provincial highway, Highway 401, runs east-west through the IBA, and there are several other provincial and county roads. In general, there are more roads and traffic in the southern half of this IBA site.

The largely rural landscape of the Napanee Limestone Plain IBA presents numerous opportunities to protect and improve habitat in the IBA for the Loggerhead Shrike and other grassland birds.

Relatively simple management strategies that employ volunteers and periodic cutting/mowing, grazing, or burning of encroaching woody vegetation at specified time may be all that is required to restore and increase the area of grassland habitat in much of this IBA where natural succession in fields is a problem.

The landowner contact program was originally developed to encourage the protection of Loggerhead Shrikes on private lands. It could also be used to inform farmers about how they could protect and enhance grassland bird habitat, as well as encourage their participation in a variety of conservation projects.

IBA partners could work with local land trusts to identify significant properties and supportive landowners, provide practical advice to landowners about grassland conservation. Eventually such a group might even purchase some properties for preservation or restoration.

There is still a need to identify and map core areas of significant value to Loggerhead Shrikes and other grassland birds. There are also numerous opportunities for research and monitoring activities.

At the present time, the most serious threats are increased human settlement, incompatible farming practices, and natural succession in or near important grassland bird habitat.

The conservation goals and objectives of the Napanee Limestone Plain IBA focus primarily on the development and implementation of strategies to protect, maintain, or restore private lands of value to grassland birds and other wildlife, through landowner contact, responsible private land stewardship, and public education. In addition, a variety of management strategies to conserve and enhance grassland breeding bird habitat will be developed for eventual application on appropriate lands in the IBA. Some of this work has already begun for the endangered Loggerhead Shrike. Long term monitoring and research of grassland birds and habitats in the IBA are also priorities.

The IBA Steering Committee and/or stakeholders or partners will evaluate and revise this conservation plan annually. Managers of short-term activities (i.e., seasonal projects, activities lasting only several months) will conduct evaluations upon completion of the project and report findings to the Steering Committee as soon as possible. As objectives are completed, the updated information will be appended to the conservation plan to show the progress that has been made.

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1 INTRODUCTION

The Napanee Limestone Plain Important Bird Area (IBA) supports a wide variety of wildlife, but is particularly important to grassland birds. Unfortunately, many of these species are declining across much of North America as grasslands are lost or severely degraded. Fortunately, this IBA supports some of the best and least disturbed grasslands remaining in Ontario.

Of particular importance is the value of this IBA to the nationally endangered eastern population of the Loggerhead Shrike (*Lanius ludovicianus migrans*). Another nationally endangered species, the Henslow's Sparrow, has been present here and suitable breeding habitat is found in the IBA. The site also supports significant numbers of some other grassland species including Upland Sandpiper, Northern Harrier, Grasshopper Sparrow, Clay-coloured Sparrow, Vesper Sparrow, and Eastern Meadowlark.

This Conservation Plan is intended primarily for use by the local IBA Steering Committee, to guide them in their bird conservation work on the site. In addition, members of the Eastern Loggerhead Shrike Recovery Team (ELSRT) could use the plan for ideas for guiding the Napanee Loggerhead Shrike Recovery Action Group (NRAG). Local municipalities might also use the plan to learn more about the principal IBA species of concern, the Loggerhead Shrike, and ways they might help to safeguard its critical habitats and encourage public education about this IBA site and associated avifauna.

It describes goals, objectives and specific strategies or actions for achieving these goals and objectives, based on consultation with interested stakeholders, and the best available information concerning the status of bird populations in the IBA and their habitat requirements. Furthermore, it is hoped that the conservation plan will encourage the diverse stakeholders to support one another in a variety of activities designed to not only conserve and restore or enhance significant bird habitats, but also to protect the more natural qualities of the Napanee Limestone Plain that residents and visitors to this area value so highly.

Section 2 describes the IBA program in more detail. Section 3 describes the location, predominant natural habitats or vegetation communities, as well as the relevant biophysical information concerning the physiography, soils, vegetation, and climate of the site. Section 4 profiles the bird species of concern in the IBA and Section 5 briefly describes other elements of high conservation concern. Section 6 summarizes land and water ownership and use in the IBA. Section 7 summarizes conservation management achieved by stakeholders and partners in the IBA. Section 8 presents opportunities for conservation and Section 9 discusses threats to the site and associated species. Section 10 presents the action plan and Section 11 suggests how it should be evaluated over time.

1.1 Key stakeholders

Listed below are the key stakeholders in the Napanee Limestone Plain IBA. Some of them have been involved with bird conservation in this IBA for more than a decade. Further information about their conservation work and the work of other partners in the IBA is presented in Section 7 and in Appendix A.

Eastern Loggerhead Shrike Recovery Team (ELSRT)

Contact: Elaine Williams Wildlife Preservation Trust of Canada (WPTC)

The Napanee Loggerhead Shrike Recovery Action Group (NRAG)

Contact: Kurt Hennige 613-386-7048

Habitat Stewardship Program (HSP)

Contact: Kurt Hennige 613-386-7048

Ontario Federation of Agriculture (OFA)

Contact: Ian Gardiner 613-396-1255

Ontario Ministry of Natural Resources (OMNR), Kingston Office

Contact: Todd Norris, District Ecologist 613-531-5700 or 531-5728

Canadian Wildlife Service (CWS)

Contact: Robert Wenting 519-986-1249 or 1-800-956-6608

Bird Studies Canada (BSC)

Contact: John McCracken 1-888-448-2473

Kingston Field Naturalists (KFN)

Contact: Chris Grooms 613-386-5041

Mohawks of the Bay of Quinte (MBQ)

Contact: Chris Maracle 613-396-3424

1.2 Local IBA Steering Committee

The local IBA Steering Committee formed as the stakeholders and other interested parties worked on this conservation plan. Currently the Steering Committee includes representatives from the Eastern Loggerhead Shrike Recovery Team, NRAG, KFN, and OFA. This committee has met once to further develop this plan and discuss related conservation issues.

2 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 that seeks to identify and conserve sites important to all bird species worldwide. Through the protection of birds and habitats, this partnership also promotes conservation of world biodiversity. There are currently IBA programs in Europe, Africa, the Middle East, Asia, and the Americas.

The Canadian BirdLife co-partners are Nature Canada (NC) and Bird Studies Canada (BSC). The Canadian IBA program is part of the Americas IBA program that includes the United States, Mexico, and 17 countries in Central and South America. Currently there are close to 600 IBAs in Canada.

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.

2.1 The Ontario IBA program

Ontario Nature (ON) is responsible for delivering conservation planning for Ontario IBAs. There are currently 70 IBA sites in the province and 19 completed conservation plans. In keeping with overall IBA program objectives, these plans promote conservation and protection of bird species and their habitats by providing information, ideas, and a variety of tools.

2.2 IBA conservation plans

IBA conservation plans are documents that outline conservation concerns and measures at specific sites identified for their importance to one or more bird species. They are developed through consultation with local stakeholders and a variety of different interest groups and used to outline feasible and beneficial activities to further bird conservation that interested people can carry out within a reasonable amount of time. Individual plan outlines are somewhat standardized but the details of each plan vary greatly depending on the unique characteristics of each IBA site. A local steering committee provides input and direction and plays a key role in plan implementation for each IBA. They are designed to complement or enhance, but not duplicate existing conservation programs and on-going efforts. These plans are open to reconsideration and revision, and are expected to change over time.

2.3 Past and on-going conservation activities

Implementation of several elements contained in the conservation plan is already occurring. For several years, a number of stakeholders listed above have been conducting numerous habitat improvement projects for the endangered Loggerhead Shrike. Each year, several local landowners and others have worked hard to improve habitat for shrikes and other grassland birds by removing encroaching woody shrubs and small red cedars to open up areas of pasture land, and by installing fencing to keep livestock out of critical areas. Other stakeholders (e.g., BSC, NRAG) have conducted population and monitoring studies of the Loggerhead Shrike and mapped shrike habitat; others (e.g., OMNR, KFN) have developed public education programs designed to raise awareness of the area and problems faced by the Loggerhead Shrike. The NRAG has been very busy completing shrike habitat management plans for local landowners. Funding and in-kind contributions have supported much of this work, but many volunteers, committing their own time and resources, have accomplished numerous shrike conservation projects on their own. More information concerning conservation work in the IBA is presented in Section 7.

3 IBA SITE INFORMATION

The following provides some basic information about this IBA site. Additional information can be found at: <http://www.bsc-eoc.org/iba/site.jsp?siteID=ON152>

The conservation plans for other Ontario IBA sites (as well as those for other provinces) can be found at: <http://www.ibacanada.ca/cp.html>

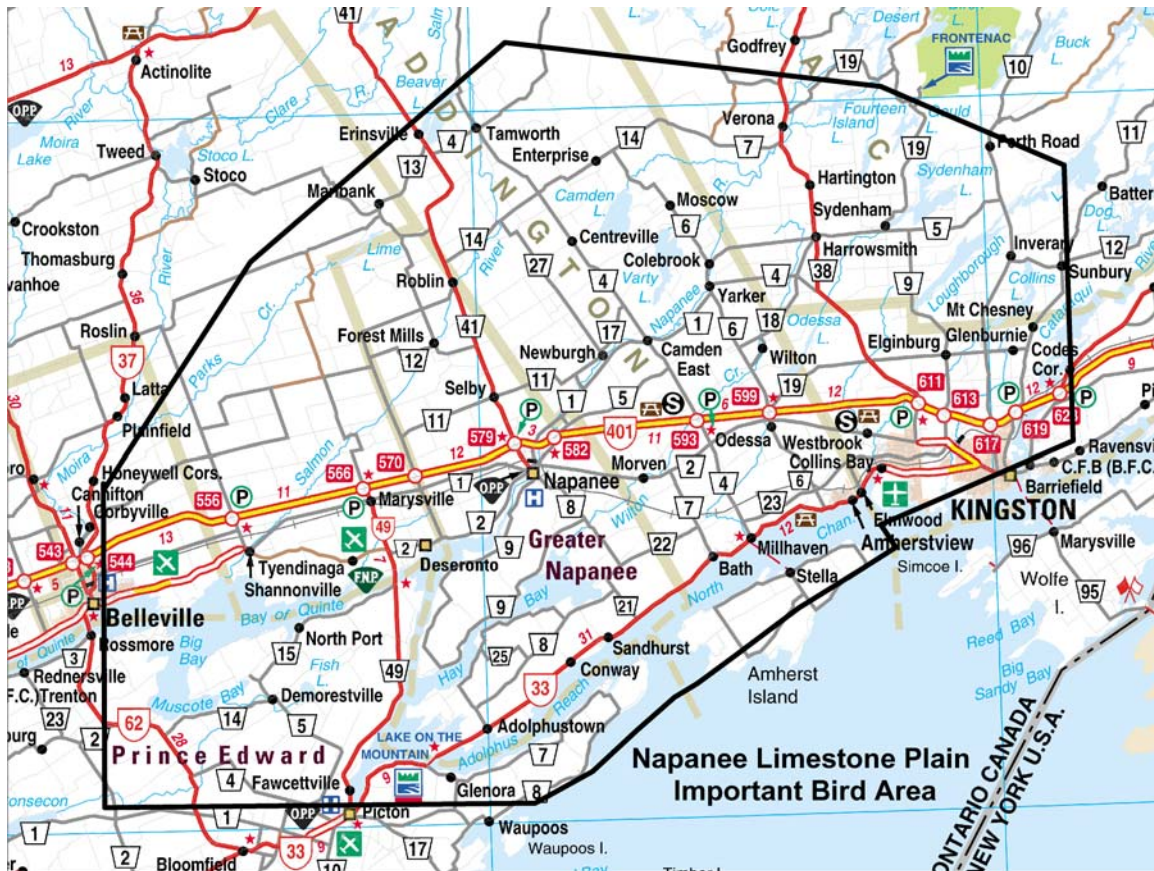


Figure 1: Location of Napanee Limestone Plain Important Bird Area and boundaries.

3.1 Location and Site Description

3.1.1 Site

Napanee Limestone Plain IBA, (CAON152G)

3.1.2 Location

The Napanee Limestone Plain is situated in eastern Ontario, with the town of Napanee near its centre (Lat.44° 25' N, Long 76° 97' W). This IBA is approximately 2000 km² and the elevation ranges between 100-150 metres.

The site includes primarily natural upland habitats between Belleville and Kingston, north to Erinsville and south to the Bay of Quinte. The nearshore waters of the IBA extend from the city of Kingston, southwest along the north shore of Lake Ontario to near the village of Glenora. The largest rivers are the Napanee River and the Salmon River. Both of them flow roughly southwest through the IBA to empty into Lake Ontario near Hay Bay and the Bay of Quinte, respectively. Two small lakes, Camden Lake and Varty Lake are found in the northeastern part of the site.

3.1.3 Physiography

The IBA is located within the physiographic region known as the Napanee Plain, a flat to undulating limestone plain of primarily Black River Limestone from the Middle Ordovician (Chapman and Putnam 1966; Hewitt 1972) that was stripped of most of the overburden by glaciation (Chapman and Putnam 1984). The gently undulating topography of the area gradually slopes towards Lake Ontario. Although the soil is often less than 30 cm in depth over much of the site, there are areas with deeper glacial till in the stream valleys and toward the north (Chapman and Putnam 1966). In addition, there are a few scattered drumlins, and mainly in the south, depressions with shallow deposits of stratified clay, providing better soils (Chapman and Putnam 1966).

Soil texture varies; loams are fairly common with pockets of clay, with both usually of post-glacial lacustrine deposition. Drainage also varies considerably across the site. Deposits of organic muck occur locally throughout the region in poorly drained depressions and basins (MacDonald 1987). Soil depth varies from being almost non-existent over some areas of limestone bedrock to several metres.

3.1.4 Climate

This IBA is situated within the South Slopes Climatic Region of southern Ontario, as defined by Brown *et al.* (1968). This region is characterized by a mean annual growing season of slightly more than 200 days and a frost free period of 140 days a year. The mean annual precipitation for this area is 85 cm, an amount typical for much of southern Ontario. Heaviest monthly rainfalls occur during April-May and August-November periods. Over a 44-year period the mean daily temperature throughout the seasons for Belleville was 6.6 C (Gillespie *et al.* 1962). Lake Ontario moderates the climate of adjacent parts of the site, whereas northern areas experience slightly colder winters and warmer summers.

3.1.5 Vegetation

This IBA is a mosaic of different vegetation communities growing on mostly shallow soils over limestone. A variety of relatively open, second growth/grazed grassland habitats in early stages of succession are especially important to IBA birds. They are

often characterized by common grasses such as Canada blue grass, Kentucky blue grass, rough hair grass, smooth brome grass, timothy, and orchard grass, growing together with common herbaceous plants such as ox-eye daisy, tufted vetch, and sheep sorrel. Dominant shrubs and trees in and around grasslands include red cedar, hawthorns, dogwoods, and viburnums.

The Napanee Limestone Plain IBA is located within the Huron-Ontario Forest Section of the larger Great Lakes-St. Lawrence Forest Region (Rowe 1972). On sites with abundant moisture and good drainage, these upland forests are typically dominated by sugar maple, red maple, red oak, basswood, American beech, eastern white pine, eastern hemlock, white ash, and/or red ash. Less commonly encountered species include black cherry, bitternut hickory, and balsam fir. Common understory trees include ironwood and blue-beech. Shagbark hickory, butternut, bur oak, and white oak are often found on warmer, drier sites.

Other habitats of importance to birds include nationally rare vegetation communities known as alvars, and areas of temperate mixed and deciduous woods, as well as pockets of temperate coniferous forest.

3.2 Designated lands within the site

OMNR has identified several Areas of Natural and Scientific Interest (ANSIs) within the (e.g., Salmon River Alvar, Westplain Mud Lake, Camden East Alvar, Asselstine Alvar, Amherstview Swamp and Bog, Big Island Coastal Wetland) and there is a Provincial Wildlife Area on Camden Lake. In addition, at least two nature reserves are found on the site, including the Menzel Nature Reserve (1996) on Mud Lake and the Sheck Nature Reserve (2001), both purchased by The Nature Conservancy for their natural values.

4 IBA SPECIES INFORMATION

4.1 Importance of the Napanee Limestone Plain IBA

The Napanee Limestone Plain IBA has been designated a nationally significant IBA under the threatened species and congregatory species categories.

4.1.1 Threatened species

Since 1991, the Loggerhead Shrike has been designated as *endangered* in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (See Table 1), and *endangered* in Ontario, since 1992, by the Committee on the Status of Species at Risk in Ontario (COSSARO).

Over the last 50 years, populations of this small bird have seriously declined throughout its North American breeding range. The decline of the eastern population has been especially widespread, persistent and severe, and is believed to have occurred primarily as a result of habitat loss, as well as effects of pesticides on young shrikes, predation, and collisions with vehicles.

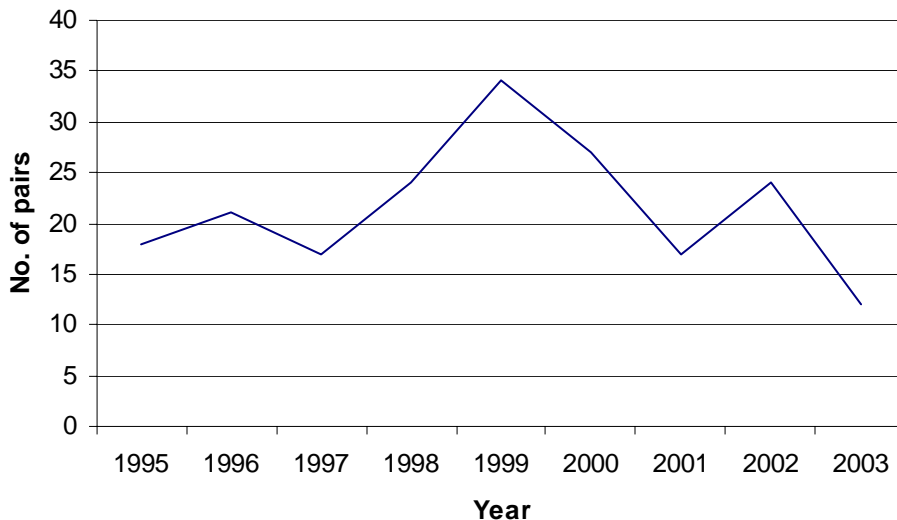


Figure 2: Number of Loggerhead Shrike pairs 1995-2003.

Throughout the 1990s, this IBA supported at least 30 % of Canada's Loggerhead Shrikes. As of 2003, survey results indicate that approximately 50 % of Ontario's breeding birds and 35 % of the Canadian total for this species around found on this site. In 2002, there were 25 pairs; in 2003 there were 12 pairs (Chris Grooms, pers. comm.).

Also of national significance is the *endangered* Henslow's Sparrow, a hard-to-find species that has been present in low numbers. Unfortunately, this bird is declining throughout most of its range and has not been recently recorded in this IBA.

4.1.2 Congregatory Species

Upland Sandpipers are found here in nationally significant numbers. It is estimated that 150 to 200 pairs breed here annually, representing perhaps 2% of the entire Canadian Upland Sandpiper population.

This IBA provides important nesting, foraging, and roosting habitat for a variety of other grassland bird species. The regionally uncommon Clay-colored Sparrow also nests here with an estimated annual breeding population of 10 to 20 pairs. Additional species of interest in the IBA and their estimated breeding populations are: Northern Harrier (20 to 30 pairs), American Kestrel (25 to 50 pairs), Common Nighthawk (20 to 30 pairs), Grasshopper Sparrow (150 to 200 pairs), Vesper Sparrow (150 to 200 pairs), and Eastern Meadowlark (200 to 400 pairs) (Ron Weir, pers. comm.).

Table 1: COSEWIC definitions.

ENDANGERED	A wildlife species that is facing imminent extirpation or extinction.
THREATENED	A wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.
SPECIAL CONCERN (previously VULNERABLE)	A wildlife species of special concern because it is particularly sensitive to human activities or natural events, but does not include an extirpated, endangered or threatened species.

4.2 Natural History of IBA Species

4.2.1 Loggerhead Shrike

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has designated the Loggerhead Shrike (*Lanius ludovicianus migrans*) as endangered in Canada because of a decline in its numbers and breeding sites.

Distribution and Population

The range of the eastern subspecies of Loggerhead Shrike once extended from Manitoba and New Brunswick south to northeastern Texas, western North Carolina and Maryland. Since the 1990s there has been a steady decline in shrike numbers in the northeastern United States and Canada. Although the southern distribution of this species remains the same, it no longer occurs in most of the northern and central areas of its former range. In Canada, the eastern subspecies of Loggerhead Shrike occurs mainly in Ontario and southeastern Manitoba. Northern populations are migratory. An analysis of long-distance recoveries from 1923 to 1983 suggests that the eastern subspecies winters about 900 km due south of its breeding grounds (Burnside 1987). However, it is still not clear where the majority of birds breed in Canada during winter.

The Loggerhead Shrike is one of the few North American passerines whose populations have declined continent wide in recent decades (Yosef 1996). The species was last recorded as nesting in the Maritimes in 1972 and Quebec in 1993. The Canadian population is very low; at most 100 pairs in three main widely separated areas: Quebec with perhaps 10 pairs of Loggerhead Shrikes; Ontario with about 40 pairs; and Manitoba with about 50 pairs.

Habitat

Foraging and nesting habitats are characterized by open landscapes with well-spaced shrubs and low trees, usually interspersed with short grasses, herbaceous plants, and bare ground. Birds are often found along roads because they prefer to perch on fence lines and utility lines and poles. Shrikes frequently use pastures because grazing livestock keep the vegetation cropped close to the ground, thereby improving the birds' hunting. However, during the 1990s, pasturelands decreased dramatically in area in both Ontario and Quebec, and remaining pastures are highly fragmented.

The area of habitat appears to be important because larger areas allow the birds to nest at a distance from fence lines and roads, thereby improving reproductive success.

Food habits

The diet of Loggerhead Shrikes consists mainly of arthropods, amphibians, small to medium-sized reptiles, and small mammals and birds. Birds will also feed on carrion such as road kills (Anderson 1976).

Breeding

Birds generally breed during their first spring after hatching (Miller 1931; Collister 1994). Many potential nest sites are inspected before the final site is selected (Yosef 1996). Amount of cover at the nest site is more important than species of tree or shrub and large, branched trees are avoided (DeGeus 1990). The well-hidden nests are commonly located in hawthorns and red cedar, and are occasionally reused. Incubation usually starts with the penultimate egg and only the female incubates. Incubation lasts approximately 15-17 days. All eggs generally hatch within 48 hours. Average clutch size is 5-6 eggs with larger clutches observed at higher latitudes (Collister 1994).

Normal hatching success (i.e., % eggs laid that hatch) is greater than 80% (Porter *et al.* 1975). Average nesting success in New York (i.e., nest in which at least one young fledge) was 50% (Novak 1989). Apparently nests in red cedars fledge more young than nests in other tree species, and nests within 100 metres of pastures are more successful than those farther away (Gawlik and Bildstein 1990).

Parents show little or no defence of eggs with the degree of defence increasing as the young grow. About 4 days after hatching, the female spends more time foraging than incubating (Yosef 1996).

Loggerhead Shrikes are typically single-brooded. If they re-nest, whether a second brood or after a failure, the new nest is located within a few hundred metres of the previous attempt (Yosef 1996).

Threats

Throughout most of the range of the Loggerhead Shrike, the conversion of farms to woodlands or suburbs has contributed to the 20th century decline (Yosef 1996). Habitat loss from intensive agricultural practices and a shift away from pasturing have contributed to the decline of species in Canada.

Predation is one of two major causes contributing to nest failure (Porter *et al.* 1975; Kridelbaugh 1982; Gawlik and Bildstein 1990; Woods 1994). In the Napanee Limestone Plain IBA, American Crows and raccoons are common predators of Loggerhead Shrikes and their nests (Chris Grooms, pers. comm.). Other potential predators include Northern Harrier, Red-tailed Hawk, squirrels, and feral or house cats. Loggerhead Shrikes chase both Brown-headed Cowbirds and Brewer's Blackbirds, suggesting that these two species are recognized as threats to Loggerhead Shrike eggs and nestlings (DeGeus and Best 1991).

Lower nest success is associated with roadside habitats that shrikes seem to prefer. Roadsides and fencerows probably attract predators because they can more easily find potential prey and because they often serve as travel corridors (DeGeus 1990; Yosef and Yosef 1992). Also fledglings, juveniles and adults are frequently killed by cars (Robertson 1930; Miller 1931; Luukkonen 1987; Gawlik 1988; Novak 1989). Flickinger (1995) believes that the exponential increase in roads and vehicular traffic since the 1940s could be a major factor in population declines.

Some research has shown that banding and marking can affect survival (Blumton 1989) and wing-tags can become entangled in vegetation, resulting in injury and death (Lohrer 1974).

4.2.2 Henslow's Sparrow

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has designated the Henslow's Sparrow (*Ammodramus henslowii*) as endangered in Canada because of a decline in its numbers and breeding sites.

Distribution and Population

The species has bred in Ontario and southwestern Quebec. Data collected for the first Ontario Breeding Bird Atlas (1981-1985) indicated that most Henslow's Sparrows were found in the southern parts of Hastings, Lennox-Addington, and Frontenac counties, as well as in Prince Edward, Grey, Bruce, and Dufferin counties. The winter range is not precisely known, but birds appear to winter mainly in the southeastern U.S. (Herkert *et al.* 2002).

Populations have declined over the last 50 years and recently the species has been identified as the highest priority for grassland bird conservation in eastern and mid-western North America (Herkert *et al.* 1996; Pashley 1996). Breeding Bird Survey trends indicate that populations have declined significantly (-7.5%/year) over the last 3 decades (1966-2000; Sauer *et al.* 2001).

Breeding has not been reported in Quebec since 1968, and the species is now considered to be accidental there. In Ontario, population declines and range reductions have been reported.

The Ontario Rare Breeding Bird Program (ORBBP) received information for only 3 active Henslow's Sparrow sites from 1989 to 1991. Although data for the Kingston area were not reported, it is believed that Henslow's Sparrow numbers have also declined in the Kingston area. In most cases, only one pair of Henslow's Sparrows was found at a given active site in Ontario.

Habitat

Relatively large fields with tall, dense grass, a well-developed litter layer, some standing dead vegetation, and sparse or no woody vegetation (e.g., shrubs, trees) characterize most Henslow's Sparrow habitat. Grass is usually the predominant form of vegetation with some scattered herbaceous plants for singing perches (Wiens 1969; Robins 1971). Suitable grassland habitats include abandoned or infrequently mowed fields, wet meadows, and ungrazed or lightly grazed pastures.

Food habits

Birds feed mostly on insects during the summer and appear to prefer grasshoppers and beetles (Hyde 1939).

Breeding

Most nests are placed among layers of thick litter about 6-8 cm off the ground (Winter 1998). Where there is little or no ground litter, nests are located within clumps of grass close to the ground (Winter 1998). Clutch size is 2-5 eggs with the average clutch size in Ontario of 3.9 (Peck and James 1987). Only the female incubates the eggs for a period of about 10-12 days. Nests appear to be an uncommon host of Brown-headed Cowbird (Friedmann 1963); only one of 12 nests (i.e., 8%) in Ontario was parasitized (Peck and James 1987). Nesting can continue into late August-early September (Hyde 1939; Sutton 1959; Robins 1971; Reinking *et al.* 2000).

In general, the Henslow's Sparrow shows low fidelity to breeding areas (Herkert *et al.* 2002).

Threats

Loss of suitable habitat is the most probable cause of recent population declines for this species (Pruitt 1996). Activities contributing to a loss in breeding habitat include conversion of pasture and hayfields to row crops, earlier and more frequent cutting of

hayfields, natural succession of vegetation due to fire suppression, wetland drainage, and urbanization (Pruitt 1996). Grassland habitat loss on wintering grounds has also occurred.

Suitable habitat still exists in parts of southern Ontario, including Napanee Limestone Plain IBA, but birds no longer breed there. There are still many gaps in knowledge about the natural history of this species, some of which may explain its absence from these habitats. For example, population numbers are reported to vary greatly from year to year (Herkert *et al.* 2002) but the underlying causes are unclear.

4.2.3 Upland Sandpiper

Distribution and Population

The main portion of this sandpiper's breeding range extends from southern Canada south to the central U.S., and from the Rocky Mountains east to the Appalachian Mountains. Small populations also breed in Alaska, the Yukon, and the Northwest Territories. It winters in South America

Breeding Bird Surveys (1966-1999) suggest that declines for this species have continued in 25 of 26 states and provinces (Houston and Bowen 2001).

Habitat

In general, the Upland Sandpiper prefers dry grasslands with low to moderate cover by herbaceous plants, moderate grass cover, moderate to high litter, low woody cover, and little bare ground (Dechant *et al.* 1999). In Ontario, where little natural grassland remains, it is found in extensive, dry, grassy fields, hayfields, wet meadows, old fields with few or no trees and shrubs, and pastures (Cadman *et al.* 1987).

Food habits

The diet of the Upland Sandpiper consists of small invertebrates (95-97%) and weed seeds (3-5%) (McAtee and Beal 1912). Birds capture low-flying insects and other invertebrates while walking on the ground.

Breeding

Upland Sandpipers have only one brood/season. They will rarely re-lay if a first clutch is destroyed (Dorio 1977; Buss and Hawkins 1939; Ailes 1980). The bird nests only on the ground (Dechant *et al.* 1999). Clutch size typically consists of 4 eggs and incubation is 21-29 days (Houston and Bowen 2001). Broods usually move from the nest site to more open habitats (Houston and Bowen 2001).

Annual reproductive success is variable. In one of the largest studies from 1963-1991, the fate of 617 nests in the prairie pothole region was followed. Thirty-two percent of them were destroyed and 1% were abandoned, for an apparent success rate of 67%. Of the 32% destroyed, 66% were lost to mammalian predators, 3% to avian predators, 5% to humans, 4% to fire, 1% to livestock, and 4% to unknown causes (Kantrud and Higgins 1992).

Upland Sandpipers rarely nest alone, but rather in loose colonies (Buss and Hawkins 1939). The same territories are occupied for years in succession (Cadman *et al.* 1987).

Threats

The plowing of land for crops has adversely affected this species more than other grassland birds (Houston and Bowen 2001).

Eggs, chicks, and sometimes adults are vulnerable to a variety of predators such as coyotes, foxes, raccoon, skunks, mink, American Crow, Sharp-shinned Hawk, Cooper's Hawk, Northern Harrier and American Kestrel (Houston and Bowen 2001).

Regular mowing of hayfields may have detrimental impacts on birds. A study in Ohio found that hayfields were cut too regularly to permit young birds to be raised successfully (Peterjohn and Rice 1991).

Cattle can trample nests and young birds (Buss and Hawkins 1939).

Shooting of birds is still a problem in the West Indies, especially Barbados (Hutt 1991) and the current status of shooting of birds in South America has not been studied (Houston and Bowen 2001).

4.2.4 Grasshopper Sparrow

Distribution and Population

The Grasshopper Sparrow is found from the southern interior of British Columbia, eastward across the southern Canadian prairies and southern Ontario and Quebec, and south to the southern U.S (Cadman *et al.* 1987). It winters from the southern U.S. to Costa Rica.

Populations of *Ammodramus savannarum pratensis*, found in eastern North America, including southern Ontario, and *Ammodramus savannarum perpallidus* (primarily a western subspecies) have declined by 69% across the U.S. since the late 1960s (Herkert 1994). Breeding Bird Survey data reveal an annual decline of -3.9% throughout North America with an annual decline of -5.9% in the eastern U.S. (Askins 1993; Peterjohn *et al.* 1994).

Habitat

This species appears to prefer fields with no trees and a low cover of grasses and herbaceous plants that are used for singing perches. In Ontario, birds are frequently found in well-drained grasslands on sandy soils (Cadman *et al.* 1987). Smith (1968) observed that this species was not found in fields with more than 35% of the area in shrubs.

The Grasshopper Sparrow also prefers larger habitats (Samson 1980; Herkert 1994; Vickery *et al.* 1994). Minimum area requirements in Maine were about 100 ha (Vickery *et al.* 1994) and approximately 30 ha in Illinois (Herkert 1994).

Food habits

In summer, birds feed mostly on insect (preferring grasshoppers) while they consume mostly seeds in winter (Vickery 1996.).

Breeding

Depending on the weather, Grasshopper Sparrows can produce two or more broods annually, even in northern parts of their range (Vickery 1996). They usually breed during their first spring after hatching. Nests are built on the ground. Clutch size is usually 4-5 eggs and second clutches are generally smaller (Vickery 1996). The incubation period is normally 11-13 days for eastern subspecies (Nicholson 1936; Smith 1968).

Nest parasitism by Brown-headed Cowbirds occurs but is generally considered to be low (Smith 1968), possibly because nests are harder to find (Elliott 1977).

Threats

Declines in populations of Grasshopper Sparrows are believed to be mainly due to loss of suitable habitat, conversion of pasture to intensive row crops, and fire prevention (Vickery 1996).

4.2.5 Clay-colored Sparrow

Distribution and Population

The Clay-colored Sparrow is found from mountain valleys of eastern British Columbia and Washington, southeast across much of the Great Plains, to the Great Lakes, central and southern Ontario and Quebec, as well as in western and northern New York. It winters from southern Texas across northern Mexico to Baja, and south through the highlands of Mexico to Veracruz, Oaxaca, and Chiapas (Knapton 1994).

During the last 20 years, some breeding populations across the central and southern prairie provinces and the Great Plains states have experienced small but significant and consistent declines, most likely due to clearing of shrub communities for agriculture and urbanization (Knapton 1994).

Habitat

The Clay-colored Sparrow is found in a variety of habitats including abandoned fields with shrubs and small trees, open shrub lands, thickets, along waterways, and in young pine plantations (Cadman et al. 1987; Knapton 1994).

Food habits

This sparrow feeds on a wide variety of seeds and invertebrates that are largely taken from the ground.

Breeding

Birds breed in their first spring after fledging with pair formation beginning soon after the arrival of females on the breeding grounds (Knapton 1994). Early nests are commonly found on or near the ground; later nests are often found in trees and shrubs, as high as 1.5

metres above the ground (Harrison, 1975). Clutches normally consist of 4 eggs and there is no replacement of lost eggs (Knapton 1994). The incubation period ranges from 10-14 days and pairs will attempt to re-nest when clutches or nestlings are lost before mid-summer (Knapton 1994).

Threats

In Alberta, birds have been eliminated from intensively cultivated areas and reduced in numbers in grazed areas (Knapton 1994). In Saskatchewan, the use of prescribed burns has also caused a decline in breeding numbers; after 3 years of burning the Clay-colored Sparrow population was only 66 % of that found in the unburned areas (Pylpec 1991). However some research suggests that this sparrow may benefit from disturbed areas on field edges (Owens and Myres 1973). Furthermore, ecological succession on abandoned farmlands, logged areas, and Christmas tree plantations has provided habitat in previously unsuitable areas (Knapton 1994).

5 OTHER ELEMENTS OF CONSERVATION VALUE

Although the IBA program has recognized the extensive and relatively undisturbed grasslands of the Napanee Limestone Plain as being especially important to several grassland bird species, there are other natural areas in this IBA of significant value to a variety of wildlife.

Some of these sites and their merits are briefly described below. They are recognized by the OMNR as provincially significant Areas of Natural and Scientific Interest (ANSIs). They are described more fully in Life Science Areas of Natural and Scientific Interest in Site District 6-9 and Site District 6-15, published by the OMNR.

Alvars are rare vegetation communities that grow on shallow, drought prone soils. They only occur in parts of the Great Lakes region, southern Sweden, and Estonia. Provincially rare plants such as Prairie Smoke, Carolina Whitlow Grass, Upland White Goldenrod, Mock Pennyroyal and several aster species are found in these places.

The Camden East Alvar is located about 3 km east and south of Camden East. It is one of the largest and least disturbed alvars in the region. The Salmon River Alvar is located 18 km east of Belleville and supports one of the most diverse alvar plant communities in Ontario. Many rare plant species have been found here. Other smaller alvars such as the Asseltine Alvar, 2 km south of Odessa, are found in other parts of the site.

The Roblin Hell-holes are located along the east slope of the Salmon River valley, approx 1.5 km east of Roblin. This is a relatively undisturbed forested site with a limestone escarpment, karst features (e.g., sinkholes, talus boulders, flowerpots, caves), and rich, cliff and talus plant communities.

Westplain Mud Lake is located just southwest of the hamlet of Westplain. It is an extensive headwater wetland with the largest extent of open and treed fen communities in the IBA. In 1993-94 The Nature Conservancy purchased a portion of this natural area and it is now known as the Menzel Centennial Provincial Nature Reserve.

Harrowsmith Bog, 3 km west of Harrowsmith is a good example of open and treed bog communities associated with a small lake. It is used for biological research and teaching.

Collins Lake Upland Forest is located approximately 9 km north-northeast of Kingston on the eastern shore of Collins Lake. It is a mature forest dominated by large sugar maple, beech, and eastern hemlocks and supports the provincially rare broad beech fern (*Phegopteris hexagonoptera*).

Cameron Creek Swamp extends along the Napanee River between Camden Lake and Petworth. This is extensive forested wetland (approximately 2700 ha) containing 3 marshy lakes plays an important role in regulating flows in the Napanee River (Lindsay 1986).

The Little and Wilton Creek Wetland (also known as the Hay Bay North Marshes) is a provincially significant wetland in Hay Bay that provides significant waterfowl nesting and migratory habitat.

The Big Island Coastal Wetland is an extensive wetland complex on the south side of Big Island, at the mouth of Demorestville Creek. It also supports significant waterfowl nesting and migratory habitat, as well as important fish spawning habitat.

Amherstview Swamp and Bog (also known as Lost Lake Swamp) is a stream-fed provincially significant wetland 10 km west of Kingston that supports one of the few bogs in the Site Region.

In addition to the ANSIs, the Camden Lake Provincial Wildlife Area attracts a variety of waterfowl during migration. Activities in this WMA are restricted and controlled by the OMNR Kingston area office. Parrot Bay, a CRCA property west of Amherstview at Highway 33 that consists of a wetland and adjacent upland forest. Hay Bay also supports large numbers of staging Common Mergansers during the autumn months. Tyendinaga Cave, just north of Shannonville supports a regionally significant bat hibernaculum. The Odessa Lake wetland is one of the few relatively undisturbed wetlands in the region.

5.1 Areas outside the IBA of potential conservation importance

There are several areas south of the Napanee Limestone Plain IBA site that are of potential conservation or strategic importance.

The value of the Prince Edward County South Shore Important Bird Area to congregatory species during spring and fall migration periods and large over-wintering populations of waterfowl make it a globally significant IBA. In addition, this IBA may support several threatened species, as defined by the Committee on the Status of Species at Risk in Ontario (COSSARO) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), including Loggerhead Shrike, Henslow's Sparrow, Black Tern, Least Bittern, and King Rail.

Another IBA on Amherst Island is both a globally and continentally significant site for congregatory waterfowl, shorebird, and raptor species. In addition, the nationally endangered Henslow's Sparrow has been reported singing at the western end of island, and a Barn Owl (eastern population, nationally endangered) nest with 5 eggs was found in 1976.

The Wolfe Island IBA is also both a globally and continentally significant IBA site for congregatory species, including large concentrations of waterfowl species, raptors, and some land birds. The Henslow's Sparrow was recorded on the island in 1950. Other species of conservation concern including Black Tern, Black-crowned Night-Heron, and the nationally vulnerable Least Bittern (see Figure 3, Section 4) have all bred in the Big Sandy Bay Wetland.

There are also several areas of importance north and/or west of the Napanee Limestone Plain IBA. For example, the grasslands around Crookston, several kilometres south of Madoc, have supported breeding Loggerhead Shrikes and other grassland birds. The Larkins Limestone Plain near Larkins is a relatively large undisturbed area with potential grassland bird habitat that has not been investigated because it is somewhat remote.

Stoco Fen, 3 km east of Stoco Lake is a Provincial Nature Reserve because of its highly significant fen and swamp vegetation communities, rare species, and high plant species diversity.

Bend Bay Valley, approximately 4 km south of town of Madoc, along the Moira River is an extensive natural area with a variety of habitats (e.g., wetlands, river valley, limestone plain, cliff). It is a large, continuous area that is relatively undisturbed.

Moira Karst is located along the Moira River, southwest of Chisholm's Mills and approximately 1.5 km north of Latta. It is a good example of karst development and a major solution cave serves as a hibernaculum for 5 species of bats.

6 LAND OWNERSHIP AND USE

6.1 Land ownership

Over 90 percent of land in the Napanee Limestone Plain IBA is privately owned. Land belonging to the Bay of Quinte Mohawks is located around the towns of Deseronto and Shannonville, on the Bay of Quinte, east of city of Belleville. Public land in this IBA consists of a few blocks of Crown land along Highway 401, various small Conservation Authority properties (Catawaqui Region Conservation Authority, Quinte Conservation), and the Camden Lake Provincial Wildlife Area on Camden Lake.

6.1.1 Historical Land Use

According to Chapman and Putnam (1966) the waterfront townships of the Napanee Limestone Plain were among the earliest areas of Upper Canada to be settled, beginning in the early 1780s. The area was soon completely occupied by farms devoted to agriculture/cultivation, primarily beef and dairy operations and crop cultivation (e.g., hay, oats, wheat, corn, mixed grains).

6.1.2 Current Land Use

Today, the predominant land uses in the IBA are related to agriculture and residential housing.

Urban/industrial development

Most development is for residential housing. Industrial park development also occurs around population centres (e.g., Kingston, Napanee, Bath).

Agriculture

Most agricultural activities are directed toward beef, dairy, and cash crop production. Much of the undeveloped land is pasture, supporting numerous small beef and dairy operations in the IBA. The majority of farmers have another source of income.

Transport

A major provincial highway, Highway 401, runs east-west through the IBA, and there are several other provincial and county roads (e.g., Hwy. 2, 41, 37, 38, and 133; County Roads 4, 6, and 49). In general, there are more roads and traffic in the southern half of this IBA site. There are airports at Kingston, and just east of Belleville.

Outdoor Recreation/tourism

Currently most of the recreation/tourism is concentrated in the population centres of Kingston, Belleville, and Napanee. It is mainly seasonal in nature, with visitation greatest during the summer months. The landowner at the Roblin Hell-holes is advertising and attracting tourists to his property to view the interesting landforms. Another landowner in Tyendinaga Township is attempting to develop a tourist operation centered on maple syrup production in his woodlot.

Hunting and fishing for sport are the predominant outdoor recreational land uses. The most popular form of hunting is the harvesting of white-tailed deer, taken mostly from private lands in the IBA. There is also some waterfowl, wild turkey, and small-game hunting. A variety of small operations cater to sport anglers who fish the Bay of Quinte.

Another popular outdoor recreational activity is trail-riding off the main roads with ATVs and snowmobiles.

Landfills/Dumps

The largest landfill in the IBA is the Richmond Landfill. There are also a few other smaller dumps.

Mining

Several aggregate quarries represent the only mining activities in this IBA. Lafarge has an active quarry on County Road 4 just north of village of Camden East. This site includes suitable and restorable Loggerhead Shrike breeding habitat (Chris Grooms, pers. comm.).

Forestry

There are no major forestry operations in the IBA. However, some landowners manage their farm woodlots, primarily for fuelwood and/or maple syrup production. There are two small sawmills near the hamlet of Chisholm's Mills, just outside the IBA.

Water management

Water levels in the two main rivers that flow through the IBA, the Salmon and the Napanee, are both controlled through a series of small (stop-log) dams or water control structures. The main purpose of this water management is to minimize flooding, especially during the spring.

Utility Line/Power Structures

There are several Ontario Hydro electricity transmission corridors that run through the IBA site. One large corridor originates at the Lennox Generating Station just west of Bath.

Fisheries/aquaculture

A major commercial fishery is located in the Bay of Quinte. There is at least one private commercial aquaculture operation near Shannonville that produces mostly trout. Another small operation near the village of Harrowsmith produces walleye. There are at least two small trout fishing ponds in Tyendinaga Township.

Wildlife Conservation/Research

Since 1991, the Eastern Loggerhead Shrike Recovery Team has conducted research on the reproductive success of Loggerhead Shrikes in the IBA.

Ducks Unlimited Canada (DUC) has completed fieldwork concerning the characteristics of high quality waterfowl breeding habitat (i.e., upland areas) adjacent to pair ponds.

Military

There are numerous fly-overs by military aircraft in Tyendinaga Township.

6.2 Land use designations

Most of the land in the Napanee Limestone Plain IBA (consisting of Stone Mills Township, Loyalist Township, Tyendinaga Township, and the Greater Town of Napanee) is designated as Restricted (Marginal) Agriculture, Agriculture (Prime Agriculture), or Rural. Development (e.g., severances, construction), with varying restrictions, can occur on all of these lands.

Development is not permitted on lands designated as Environmental Protection, usually wetlands, creeks, streams, shorelines, or lands designated as Environmentally Sensitive, usually significant natural features such as alvars and ANSIs.

6.3 Protective Legislation

The most pertinent legislation affecting the conservation of grassland bird habitat and species is the provincial Endangered Species Act (ESA) that came into effect in 1971. It includes provisions to protect species that are listed as endangered, as well as their habitats. Application of the ESA will help to prevent destruction of Loggerhead Shrike (or other endangered species habitat) for 5 years after the last breeding record. It is based on a 400-meter radius around the nest site, within the habitat. It should be noted that the townships in the IBA are concerned that they will be charged or liable if they approve building or severances on this ESA habitat and are taking on recommendations of the OMNR to prohibit building and severance on such lands (Chris Grooms, pers. comm.).

The IBA species and land bird migrants are protected under the Migratory Bird Convention Act, passed in 1917. Birds of prey and the Turkey Vulture are protected in Ontario under the Fish and Wildlife Conservation Act of Ontario.

The Species at Risk Act (SARA) was finally passed in 2002 but its implementation has been delayed. At present, it only applies to Federal Lands.

7 CONSERVATION MANAGEMENT

Section 7 highlights some of the conservation management activities that stakeholders, both organizations and individuals, have completed and are currently conducting within the Napanee Limestone Plain IBA site. Overall, the emphasis is and has been on habitat improvement and protection for the Loggerhead Shrike, as well as on education of landowners with existing or potential significant breeding habitat for this bird.

7.1 Lead agencies and their conservation programs

7.1.1 Eastern Loggerhead Shrike Recovery Team

This team is coordinating recovery actions for *Lanius ludovicianus migrans* subspecies across the country. They put together the plan and the strategy to achieve the plan objectives and decide what needs to be done. Partners in the Loggerhead Shrike Recovery Team include Bird Studies Canada (BSC), Ontario Nature (ON), the Canadian Wildlife Service (CWS), the Ontario Ministry of Natural Resources (OMNR), McGill University, and the Metro Toronto Zoo. Past and present sponsors of the recovery program include the CWS, OMNR, World Wildlife Fund Canada's Endangered Species Recovery Fund, Environment Canada's Action 21 program (now EcoAction 2000), Vinylgraphics Custom Sign Centres, and Shell Canada.

Some of their research and monitoring activities include studies of the reproductive biology and habitat use by Loggerhead Shrikes (1990-1993), study of vocalization behavior (1994), and testing of captive breeding and release techniques (1992-present). Since 1992 the nesting success of Loggerhead Shrikes has also been monitored. In 1996, shrike DNA was analyzed to determine that eastern and prairie populations were in fact distinct subspecies. In 1998, studies concerning population status, reproductive success and fledgling survival were conducted, as well as studies examining the impacts of road signs and mailbox fliers on road mortalities of birds. The toxicology of a road dust suppressant on bird survival was also examined.

The group has also initiated numerous recovery activities. In 1996, they produced a resource kit designed to inform landowners in core breeding areas about the significance of Loggerhead Shrikes on their property. In 1998, staff interviewed 20 landowners, collected 32 nestlings to augment the two captive breeding populations, and completed a protocol for the release of captive-reared birds. They also mapped and characterized eligible habitat for Ontario's Conservation Land Tax Incentive Program, helped to manage important shrike habitat; erected signs to reduce vehicle speed on roads adjacent to breeding habitats in an effort to reduce road mortalities. In addition, staff produced a video and sent information packages to landowners.

A banding study began in 1999. The main objective is to learn more about post-fledgling survivorship, immigration and emigration rates among the 4 sub-populations in Ontario (Napanee, Smiths Falls, Carden and Grey-Bruce/Manitoulin), longevity, age structure, overall population size, and site fidelity. This study could also help to assess the efficacy

of a planned release program and provide information about where the birds spend the winter.

In 2000, this group produced a communications and marketing strategy and a public service announcement on the *L. l. migrans* subspecies. They also developed the experimental field propagation and release programs.

In 2001, work began to control the spread of red cedar in grasslands on the Bay of Quinte Mohawk reserve, to improve and maintain habitat quality in this area.

Staff is continuing to work with landowners to improve, protect and manage habitat for these birds.

7.1.2 Napanee Loggerhead Shrike Recovery Action Group (NRAG)

This is a group of interested people working for government and non-government organizations. They represent the stakeholders and try to implement the strategies developed by the Loggerhead Shrike Recovery Team. They have been mainly concerned with providing advice concerning how to complete specific habitat improvement or restoration projects at the local level.

Their past efforts have concentrated on habitat restoration efforts and intensive monitoring of breeding activity at several locations in the IBA.

7.1.3 Canadian Cattlemen's Association (CCA)

The CCA has been a member of the Eastern Loggerhead Shrike Recovery Team, in charge of disbursement of funds for the 5-year Habitat Stewardship Program (HSP) that began in 1999.

The HSP emphasizes feasible habitat improvement or restoration projects that benefit Loggerhead Shrikes and other grassland birds. Through HSP funding/support, approximately 22 shrike-related projects were accomplished in 2003. For example, habitat restoration on 3 properties (approximately 40 ha) was conducted near the village of Newburgh. Shrubs were thinned and old fences were replaced with new ones. The Habitat Stewardship Program supplied the fence materials and the landowner installed them. At another site 3 km east of Yarker, a bulldozer was used to remove junipers from a 30 ha pasture. Thinning of shrubs and trees is also ongoing on a 40 ha property west of the village of Roblin.

7.1.4 Canadian Wildlife Service (CWS)

CWS is a branch of Environment Canada and is concerned with the conservation, management, and protection of wildlife and habitats across Canada. Their activities include research, wildlife surveys, enforcement, monitoring, management, and public education. They often work in partnerships with both government and non-government organizations. CWS is a member of the Loggerhead Shrike Recovery Team.

The CWS web page is: http://www.on.ec.gc.ca/wildlife_e.htm

7.1.5 Ontario Ministry of Natural Resources (OMNR)

The OMNR is responsible for sustainably managing the forests, fish, wildlife of the province, as well as the Crown lands and waters, provincial parks and protected areas, aggregates, fuel resources, so as to provide environmental, social, and economic benefits. The OMNR manages several small parcels of Crown land in the IBA, most of it along Highway 401 and near Camden and Varty Lakes. OMNR is a member of the Loggerhead Shrike Recovery Team. Their website is: <http://www.mnr.gov.on.ca/MNR/>

7.1.6 Bird Studies Canada (BSC)

BSC is a non-profit conservation organization dedicated to advancing the conservation, understanding, and appreciation of wild birds and their habitats, through a variety of programs and studies involving staff, members, volunteers, and the interested public. BSC is an active partner in the Eastern Loggerhead Shrike Recovery Team. The BSC web page is: <http://www.bsc-eoc.org/>

7.1.7 Kingston Field Naturalists (KFN)

The Kingston Field Naturalists is a non-profit charitable organization and an affiliate of Ontario Nature. Club members work to acquire, record, and provide knowledge of natural history; to stimulate public interest in nature and the protection and preservation of wildlife and wildlife habitats; and to acquire, receive and hold lands for the purpose of preserving their natural flora and fauna. Numerous long-term members of this club are dedicated and skilled birders who know the premier birding locations of the IBA very well. The KFN webpage is: www.kingstonfieldnaturalists.org.

The club participates in a variety of projects, many of them in the IBA, including censuses and surveys (e.g., bird counts), atlas and inventory work (e.g., Ontario Breeding Bird Atlas), monitoring work (e.g., marsh monitoring), and habitat restoration and improvement (e.g., Loggerhead Shrike habitat restoration, nest boxes),

The KFN has been the community leader in this IBA site. In 1999, several members of the executive initiated the drive to have this site designated as an IBA. Most recently, in March 2004, club members and several local volunteers erected the two Important Bird Area Welcome Signs in front of stores in the communities of Newburgh, and Blessington. The information on these signs focuses on Loggerhead Shrikes.

7.1.8 Ontario Federation of Agriculture (OFA)

OFA is an important stakeholder because this group is most representative of local landowners, since the majority of the landowners in the IBA are members of the OFA. OFA is also a member of the Eastern Loggerhead Shrike Recovery Team, providing valuable advice, criticism, and landowner opinions pertaining to farm management for grassland birds such as the Loggerhead Shrike.

7.1.9 Stewardship Councils

Lennox and Addington Community Stewardship Council (LACSC)

The Lennox and Addington Community Stewardship Program works towards ensuring a healthy and sustainable environment by promoting responsible land care and stewardship

of our natural resources, and by encouraging a cooperative approach to improve our local natural environments. It is a community based volunteer organization that exists to identify and develop ways of meeting the stewardship needs of the community, bring together those interested in promoting the stewardship ethic, and gather and share information with the community about stewardship and land care.

The group has numerous projects concerning wildlife habitat, woodlot management, watershed issues, and environmental education. The LACSC is involved with the Eastern Ontario Loggerhead Shrike Recovery Program. Their local Recovery Action Group, consisting of volunteers from the KFN, Lennox and Addington Federation of Agriculture, Lennox and Addington Community Stewardship Council, local beef and dairy farmers, agency representatives (OMNR, OMAF), and the Loggerhead Shrike Recovery Team, has worked with local landowners to restore potential shrike breeding habitat. Volunteers have cut and removed red cedar in pasturelands adjacent to core breeding areas, to open up the land, thus making it more attractive to the birds. They have also built fences that are maintained by the landowners, and helped to install alternate watering systems for livestock. Approximately 20 hectares of degraded pasture have been restored to suitable habitat for the shrike.

In Stone Mills Township, volunteers installed road signs in key areas, warning drivers to slow down. Shrikes fly low and hunt the open roadsides, so drivers need to be cautious, especially in their known nesting areas, such as the Newburgh region. Their website is: <http://www.ontariostewardship.org/LENNOXADD/lennox.htm>

Hastings Stewardship Council (HSC)

The Hastings Stewardship Council is a volunteer group working to achieve and maintain a healthy environment in Hastings County. The Council works with individual landowners to determine community stewardship priorities. The Council and the Stewardship Coordinator plan programs and locate resources to meet the land stewardship needs of the community.

The HSC promotes co-operation among land user groups, helps to plan and support land stewardship projects, and develops workshops and information to support land stewardship in Hastings County. Projects are concerned with wildlife habitat restoration, woodlot management, and environmental education. Council members and volunteers have worked with the Loggerhead Shrike Recovery Team to restore and expand suitable nesting and foraging habitat for this endangered species, by cutting and clearing red cedar. Their website is: <http://www.ontariostewardship.org/HASTINGS/hastings.htm>

7.1.10 Private Landowners

The majority of work with landowners is in a 50:50 partnership with the Habitat Stewardship Program focusing on habitat improvement for Loggerhead Shrikes. For example, the program pays for fencing and the landowners put it up. Or, staff working with the Habitat Stewardship Program clear potential shrike habitat and the landowner clears the slash from his/her property.

Approximately 300 landowners have received information about the endangered Loggerhead Shrike populations and on-going efforts to conserve this species through scientific studies, habitat restoration, and public education. Many of them have agreed to consider the Loggerhead Shrike in their property management decisions. Furthermore, each year, about 20-30 landowners work with the Habitat Stewardship Program of the Eastern Loggerhead Shrike Recovery Team, to manage their land for the benefit of these birds. Also a variety of volunteers (e.g., area landowners, Boy Scouts, Kingston Field Naturalists, Stewardship council members) have contributed their time and materials, working on related small projects. The Mohawks of the Bay of Quinte (MBQ) have worked with the Habitat Stewardship Program on some of their lands. This is notable because they are the potential stewards of a considerable amount of active breeding habitat for this species.

In addition, Stone Mills Township agreed to allow posting of road signs that urge drivers to slow down through critical habitat areas for nesting Loggerhead Shrikes.

It should be noted that at the present time, most of the private landowners are unaware of the IBA program and IBA species in the Napanee Limestone Plain IBA. However, field workers have noted that when landowners were informed about the program and bird species of concern, their response to the program and its objectives has generally been favorable.

Corporate sponsorship represents further support for Loggerhead Shrike conservation efforts. Goodyear contributed financial aid 1995 and 2001. Local stores in Newburgh and Blessington allowed IBA signs to be erected on their property. Production of these signs was funded by Nature Canada's Communities in Action program through corporate donations from Noranda Inc. and Falconbridge Limited.

8 OPPORTUNITIES

Land development is converting forests, grasslands, and farms to other uses, often threatening native plant and wildlife communities and their associated ecological functions and processes. It reduces and fragments remaining natural areas and their associated diversity of habitats, eventually leading to a reduction in the number and diversity of native plant and animal species. It can also have detrimental impacts on natural ecosystems such as wetlands and grasslands that provide beneficial and free services (e.g., flood control, prevention of soil erosion, reduction of soil run-off into waterways, pollution filtration), threatening environmental and human health.

In addition, much poorly planned development often increases the cost of public services by requiring larger investments in public infrastructure such as new roads, schools, utility lines, and sewers. And whereas farmlands, forests, wetlands, and open space generate more in taxes than they cost to service, scattered residential development often costs more in services than it produces in taxes because the latter requires the provision of services over a larger area.

Maintaining and restoring grasslands in the IBA could help to provide a variety of ecological, social, and economic benefits to the people of the area such as the maintenance of natural landscape processes, greater species and habitat diversity, a more attractive landscape, increased property values, decreased costs of public services and infrastructure, improved general health of communities, provision of recreational opportunities, and a better awareness of the natural world. It might also encourage the development of productive relationships among different agencies, non-governmental organizations, and the private sector working together to conserve grasslands and other natural ecosystems.

Maintenance of a system of relatively undisturbed and connected grasslands (and other important natural areas such as forests and wetlands) would help all of these ecosystems to function better, provide safer movement corridors for a variety of wildlife, and reduce the amount of edge habitat and number of isolated patches of grasslands and other habitats. The benefits of such a linked system would extend to areas located outside the Napanee Limestone Plain (e.g., IBAs in Prince Edward County, Amherst Island, Wolfe Island) and successful grassland conservation here would significantly add to the overall area of grassland habitat remaining in this part of the province.

Residents of the Napanee Limestone Plain IBA are fortunate because much of this IBA is still rural countryside with abandoned fields, hayfields and pasture commonly encountered throughout the region. This relatively undisturbed landscape presents numerous opportunities to further protect and improve habitat not only for endangered species such as the Loggerhead Shrike and Henslow's Sparrow, and other grassland bird species, but myriad other plants and animals that depend on healthy and intact grasslands for their long-term survival. As well, development pressures on most lands in the IBA are

considerably less than in many other parts of southern Ontario. In short, there is still time to conserve grassland and other important habitats in this IBA.

There are good reasons for optimism about future conservation efforts in this IBA. Several agencies and individuals have already invested considerable time and financial resources for over 10 years, working with one another and landowners on a variety of projects. Local commitment to bird conservation activities remains quite strong, in part because numerous successes have helped to protect and restore grassland habitat for Loggerhead Shrike and other grassland species. In general, landowners have also been receptive to public education programs (e.g., private land stewardship initiatives, landowner contact). In addition, some residents view grassland conservation on lands adjacent to their property as one way to protect the area from what they see as undesirable or incompatible land uses (e.g., large-scale chicken farms).

It should also be noted that in much of this IBA, relatively simple and inexpensive management strategies that employ volunteers and periodic cutting/mowing, grazing, or burning of encroaching woody vegetation at specified times may be all that is required to increase the area of grassland habitat.

Excellent opportunities exist to enhance bird conservation in the Napanee Limestone Plain IBA. Working with local land trusts dedicated to the conservation of the natural and cultural heritage of the region could greatly benefit wildlife, including species of conservation concern. These organizations, comprised mainly of local residents, could identify significant properties (e.g., critical or threatened bird habitat) and supportive landowners, provide practical advice to landowners about grassland conservation (e.g., potential management issues and activities, legal advice about conservation easements), and eventually purchase some properties for preservation or restoration.

There is a good opportunity to encourage local residents to take up birding as an outdoor recreational activity. Many members of both the KFN and the QFNA are excellent birders who are often willing to take along novice birders as they check out known locales for a variety of species. Those who discover the enjoyment of birding are likely to support bird conservation efforts in the IBA. Here again there is cause for optimism. According to Ross (1999), bird watching is one of the fastest growing activities in North America, and by participation numbers, growing faster than golfing and gardening in the U.S.

Encouraging nature-based tourism in the IBA provides another opportunity to educate residents about the IBA program and the site, increase public understanding and support for conservation projects in the IBA, and generate some revenue for some local businesses. This site is well situated to take advantage of such tourism. It is located approximately 3.5 hours from Toronto, Canada's most populous city. Almost the entire site is within a 40-minute drive from Highway 401, one of the busiest highways in the province. Also the close proximity of this IBA to better known birding areas such as Presqu'île Provincial Park, Prince Edward County, and Amherst Island could help to increase visitation to the site by nature enthusiasts. Advertising the better birding areas in

the IBA and the provision of some basic services (e.g., maps, signage, observation tower, blinds) at strategic points could increase visitation to the IBA.

Developing and staging an annual birding festival would provide another opportunity to educate people about the IBA program and site, advertise the IBA to a larger audience, and possibly generate some revenue for area businesses. There are over 25 annual birding festivals in Canada. Presqu'île Provincial Park and Point Pelee National Park have long-running festivals that in 1999 attracted 10,000 and 80,000 participants respectively (Ross 1999).

Numerous other opportunities exist to promote understanding of and support for bird conservation and the IBA program and site. Some of these are briefly outlined in Section 10.

8.1 Knowledge gaps

Although opportunities abound to inform the public about the IBA program and site and encourage people to support the program and undertake bird conservation projects, there are numerous areas where more information is required. A few of the more salient limitations in knowledge are listed below. It is hoped that identification of gaps in knowledge can help to focus potential IBA conservation plan objectives.

Management activities

- Where are the priority properties and who are the supportive landowners?
- What are the most appropriate management activities for these sites?
- What strategies for the continuation of conservation management projects are already in place?
- What is the state of funding and manpower for upcoming management projects?
- What management actions have clearly not worked and why?
- What are the funding sources?

Local land trusts

- What is the present status of local land trusts?
- How can the IBA Steering Committee and partners work with local land trusts to secure significant grasslands for bird conservation in the IBA?

Public education about IBA program, site

- What companies produce affordable, and yet durable signs?
- Who might present educational programs?
- Where could a visitor centre be developed?
- What existing facilities in the IBA might be used as outdoor centres for school groups?
- Where could a system of birding trails/routes be developed?
- What habitats/communities would be most attractive for study by school groups?

- What landowners might provide access to their property for educational use by school groups?
- What are some potential fund-raising events (e.g., Birdathons)?

Research and monitoring

- What other bird conservation programs could be developed in the IBA?

Promote economic benefits of the IBA

- What are the best ways to promote revenue-generating opportunities?
- Where are the best and safest birding spots for roadside birding, during spring, summer, fall, and winter?
- When and where are the best locations to see selected birds?
- What would be the most feasible route to link these spots?
- What landowners might provide access to their property for use by birders or tour groups?
- What tourist establishments, both inside and outside the site might provide birding tours in the site?

9 THREATS

The IBA Steering Committee identified several real and potential threats to IBA species and their habitat. These are discussed below and briefly summarized in Table 2. In general these threats have caused or are continuing to cause habitat loss and/or degradation, often accompanied by loss of birds as well.

Based on a review of the literature concerning grassland bird management (Bland 1997), the size of the grassland areas and the associated vegetation community diversity were frequently mentioned as being important to many grassland bird species and hence to grassland bird conservation programs in general. For example, considerable research (Herkert 1991; Samson 1980; Smith 1991; Peterson 1983) has suggested that larger grassland areas are best because they are more attractive to area sensitive species, more likely to be buffered from disturbance, more likely to increase the distance of nesting habitat to woody edges (thereby reducing nest predation and parasitism) (Best 1978; Bollinger and Gavin 1992; Gates and Gysel 1978; Johnson and Temple 1990; Paton 1994), and provide more opportunities nesting.

Consequently, it should be emphasized that any further loss of grassland habitat in this IBA represents a major threat to IBA species such as Loggerhead Shrike, Upland Sandpiper, and numerous sparrows such as the endangered Henslow's Sparrow.

Table 2: High priority threats to IBA site and associated species.

Threat	Cause/Source	IBA spp. affected/comments
Increased human settlement	Grassland conversion to homes, industrial parks (e.g., Bath), roads, associated services; increased traffic; most pronounced around existing communities and near roads	All grasslands spp. affected, those near roads at increased risk to vehicle collisions; much grassland loss resulting from this threat is permanent
Crop cultivation	Habitat loss, degradation; loss of large grasslands as land is put into cultivation.	All grassland species; both negative and positive impacts depending on area planted, farm management
Grazing	Habitat loss, degradation from dairy, beef, hobby farms; under-grazing more of a threat than overgrazing	All grassland species; impacts depend on intensity, timing, site factors
Natural succession	From lack of vegetation control on residential and farmlands, loss of grazing or undergrazing; most evident on properties greater than 2 ha not devoted to agriculture; in general all the pastureland is heavily affected by natural succession	All grassland species; this threat may increase if land converted from agriculture to residential; some of these areas have been mapped as they pertain to Loggerhead Shrike habitat
Disturbance	Primarily vehicles, farm machinery, human activities, road construction and improvements; most pronounced near residential areas, farms, and roads	All grassland species, especially ground nesters; may create ecological sinks as birds nest in areas of suitable habitat but reproductive success is low due to loss of nests/birds

9.1 Human disturbance

Several forms of human disturbance currently threaten IBA species and grassland habitats on the Napanee Limestone Plain. The most serious pertain to increased settlement, certain agricultural activities, and traffic on roads within the IBA. The main forms of human disturbance and their respective level of threat to the site and associated species are briefly summarized below.

9.1.1 Increased settlement in the IBA

This leads to loss of grassland habitat as fields (e.g., abandoned pasture, hayfields) are converted to residential housing and to a lesser extent, industrial parks. Associated services including roads and electricity transmission lines further compound the problem of disturbance. Often disturbance affects adjacent grasslands because of a general increase in traffic, recreational activities, and domestic animals (e.g., hobby farm animals, house cats).

Roads constitute one of the most insidious threats to grassland birds and their habitats. An increase in human settlement leads to pressure on townships to improve existing roads. As the roads are improved, vehicles travel faster with negative impacts on grassland birds and other wildlife. Also building increases in these areas because more people want to live along improved roads. The cycle continues and increasing traffic and human population have greater detrimental environmental impacts on habitats and associated species.

Furthermore, as the region becomes more residential, more people become concerned about issues such as water contamination (i.e., well water) and odors (i.e., manure, fertilizers). And many of these newly arrived people will not allow grazing on their property because of these concerns. This results in greater pressure on remaining farmers to conduct their agricultural businesses in specific ways. The cost to sever lots for some farmers might also increase because the lots must be fenced to keep cattle off them, if the farmers want to continue grazing their livestock in the same area.

The level of this threat is high, particularly in areas closest to population centres. This threat may well become more serious in the near future as more people seek affordable country living close to attractive population centres such as Kingston, Belleville, and Napanee.

9.1.2 Agricultural activities

In general, agricultural activities that reduce the size of fields and simplify vegetation structure and diversity discourage nesting by numerous grassland bird species such as the endangered Henslow's Sparrows. Activities that increase edge habitat can also encourage predation of nests.

The specific impacts of agricultural activities (e.g., grazing, crop cultivation) on IBA species and habitats are varied, depending on the nature of these activities and the bird species affected. Some directly threaten birds and their reproductive success. For example, mowing of hayfields during the breeding season results in some nest destruction

and loss of birds. Disturbance in nesting areas from farm machinery will cause some birds to abandon their nests.

Some agricultural activities threaten habitat. Conversion of fields to row crops such as corn, soybeans, and grains results in a loss of grassland habitat for IBA species. Such conversion often occurs because farmers believe they must plant more land to continue farming.

Usually crop cultivation occurs on more arable lands while livestock, especially beef cattle occupy less productive lands. Impacts vary depending on the type of crop and the area planted. In general, crop cultivation, especially the planting of monocultures such as corn and soybeans, results in direct loss or reduction of nesting habitat (i.e., vegetation ground cover) for most bird species, but may provide limited foraging and cover habitats for some species.

The level of threat to the IBA site of crop cultivation is unknown but probably quite serious in areas where farmers feel they must clear more land and plant cash crops in order to remain in business. The threat of land conversion for purposes of development (e.g., homes) is probably high in much of this IBA because most of the agricultural land in the region is marginal, resulting in a relatively low financial return compared to higher quality farmlands.

Grazing can have positive or negative impacts on grassland habitat and avifauna, depending on its intensity, timing, and site conditions. Some areas of the IBA are overgrazed, resulting in a loss of potential grassland habitat. Livestock remove most of the vegetation used for nesting, foraging, and cover, and compact the soils. Under-grazed areas become too choked with woody vegetation, making them unattractive to most grassland species. The effects of light to moderate grazing on bird habitat are probably less clear.

Grazing is directly affecting the breeding population of Loggerhead Shrikes on the IBA site. This species will not nest where it occurs at moderate to intense levels because such management results in the removal of too much ground cover. This leads to fewer insects that shrikes rely on for food. If grazing is too light, vegetation can become too dense and tall for use by hunting birds. If grazing is curtailed, encroaching shrubs and trees will eventually discourage use of the land by shrikes.

The level of this threat is high, particularly in parts of the IBA where farming is not profitable (e.g., shallow soils) and where grasslands are located in areas where land is being developed for housing or industrial parks.

Concerns about ground and surface water contamination from agricultural operations also threaten grassland habitat. Nutrient/waste management regulations, scheduled to come into effect in 2007, will likely increase conversion of grassland to cropland because the associated costs will make profitable farming more difficult. Since farmers will have to get rid of their manure, some of them (e.g., larger operations) will need to have more land

planted to crops on which their excess manure can be spread. Shallow soil depths in many parts of the IBA will also likely limit the amount of manure that can be spread on land in these areas. This could result in additional pressure on affected landowners with some of them possibly shutting down or clearing more land for croplands so surplus manure can be spread.

Finally, a part of this legislation seeks to control or eliminate the over-wintering of cattle in woodlands. However, if farmers are not permitted to do this, some of them may have to terminate their operations.

As increasing numbers of small farming operations in this IBA close down and/or sell out, the fewer remaining operations are becoming larger and require more land. This results in more loss of potential grassland bird habitat, as these areas are improved for pastures and croplands, or developed for housing.

9.1.3 Vehicles

Cars, trucks, ATVs, and some farm machinery can threaten IBA species and habitat. Some birds, especially fledglings, are killed by vehicle collisions when they fly low across roads. Also as roads are improved and developed in the IBA, traffic and population will likely increase, with additional impacts on the IBA site and species.

The level of this threat is high along roads through grassland breeding bird habitat and probably low elsewhere in the IBA.

9.1.4 Outdoor recreation/tourism

Roadkills of grassland birds such as the Loggerhead Shrike could rise as recreational or tourist traffic on some of the roads increased. Riding ATVs and trucks off the main roads has damaged grassland bird habitat (e.g., vegetation, thatch layer) in other areas, especially when riders are out during the spring when soils are often waterlogged. This activity can also disturb nesting birds. Creation of trails encourages further use by other riders. There is also the risk of fires during the nesting season.

Overall, the level of threat is likely minor throughout this site because most of the land is private. The threat is probably greatest on grasslands on the few public lands in the IBA.

9.1.5 Landfills/dumps

The Richmond Landfill is located on the edge of good Loggerhead Shrike breeding habitat and another potential site for another dump is also good shrike habitat (Chris Grooms, pers. comm.). Unfortunately site disturbance would probably prevent use of this area by nesting birds. Also the Richmond Landfill may be attracting predators that threaten nesting birds on land adjacent to it.

The level of threat to the IBA site and species is currently low.

9.1.6 Mining

With the possible exception of the aggregate quarry on County Road 4 north of village of Camden East, impacts of existing quarries on grassland bird habitat are probably minimal. However, there is a potential loss of grassland bird habitat as additional locations are quarried. In addition, increased truck traffic to and from quarries could result in a greater number of road-killed birds. The impacts of increased levels of dust on invertebrate prey species of Loggerhead Shrikes is unknown, but dust covered vegetation in adjacent fields might affect prey availability.

9.1.7 Forestry

Logging trucks occasionally travel on roads in the IBA. Depending on the time of year, they can increase levels of ambient dust and possibly threaten birds found in adjacent fields (i.e., collisions) but these impacts are likely minimal.

9.1.8 Water Management

Water management on the two major rivers in the IBA (Salmon, Napanee) has little or no impact on grassland birds and their habitats. However, such activities provide aquatic and riparian habitat for a variety of other wildlife. Some of these habitats may also function as valuable animal movement corridors across the IBA.

9.1.9 Utility Line/Power Structures

Impacts are generally negative because of resulting habitat loss and disturbance, as these areas are maintained in an open state by controlling vegetation through cutting and spraying. The development of additional corridors and lines would result in further habitat loss and disturbance.

9.1.10 Other disturbance

Other activities such as the illegal dumping of garbage, fire, and afforestation (i.e., tree planting) have minor impacts on IBA species. Wildlife conservation projects and research have the potential to disturb birds. For example, the color banding study conducted by the Eastern Loggerhead Shrike Recovery Team to learn more about factors such as post-fledgling survivorship, immigration and emigration rates, overall population size, and site fidelity was a source of potential disturbance to the birds in the study (Chris Grooms, pers. comm.). Nevertheless, research such as work by Ducks Unlimited Canada, has the potential to help future management efforts in the IBA by increasing the biological information for the IBA site.

Non-native plant species may be having adverse impacts on the avifauna of the site but this has not been confirmed. This is more likely to occur where shrubby species such as European buckthorn and honeysuckles form fencerows leading into nesting areas. Nest predators follow these fencerows to hunting areas and ground-nesting birds are especially susceptible to their depredations. In some parts of the IBA, extensive and dense growth of some species (e.g., dogwoods, honeysuckles) might also be degrading existing wildlife habitat by reducing native plant species diversity.

9.2 Natural succession

Grasslands are one of the most endangered ecosystems in North America. As a result, numerous grassland bird species, including the endangered Loggerhead Shrike and Henslow's Sparrow are undergoing population declines. Survey data from the North American Breeding Bird Survey from 1966 to 1995 revealed that 28 bird species that breed in grasslands showed declines throughout most of the region. In fact, grassland birds showed the most consistent declines of any group of birds monitored by this survey (Sauer *et al.* 1997). Habitat loss and increased mowing of grassland for hay production on the breeding grounds, as well as problems along migratory routes or on the wintering grounds may be responsible for many of the declines (Sauer *et al.* 1997; White *et al.* 2000).

On the Napanee Limestone Plain IBA, natural succession is occurring where no grazing, mowing, cutting, or burning controls the growth of vegetation. Shrubs and trees such as dogwoods, prickly ash, European buckthorn, red cedar, and red ash (*Fraxinus pennsylvanica*) invade these areas and the open nature of the landscape, attractive to many grassland species, is lost.

Natural succession is affecting the breeding population of Loggerhead Shrike in this IBA by reducing the area of suitable nesting habitat available to this nationally significant species. Breeding individuals require a fairly large area so that one pair cannot see another pair, otherwise they will both be wasting too much time with aggressive behavior. In addition, too many shrubs and small trees, as well as a ground cover of dense or tall grasses and forbs make hunting difficult for the birds.

The level of threat from natural succession is high throughout much of this IBA. It is most serious where farmland or rural residential properties are passively managed (i.e., left alone). It is also likely that as agricultural activity declines in the IBA, natural succession will increase, particularly if more land is converted to rural residences on properties of 2 ha or more. It should also be noted that natural succession has been occurring in some areas in spite of on-going efforts to control it, possibly due to an extremely high abundance of seeds in the soil (Chris Grooms, pers. comm.).

10 THE ACTION PLAN

The following Action Plan outlines the vision, goals, objectives, and actions/strategies that were developed in consultation with the local IBA Steering Committee for the Napanee Limestone Plain Important Bird Area.

Suggested actions or strategies follow each objective as a bullet. The priority of each action or strategy follows in brackets and is denoted by high, medium, low, or ongoing. The latter represents actions that have already been initiated and are continuing. Acronyms for potential leaders of each action/strategy follow the priority level in brackets. Although several groups are given for many suggested actions, it is expected that only one or two of these groups will assume leadership roles for a given action or strategy. Also some of the suggested actions or strategies might help to accomplish more than one objective.

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

IBA Steering Committee (IBA)
Eastern Loggerhead Shrike Recovery Team (ELSRT)
Napanee Loggerhead Shrike Recovery Action Group (NRAG)
Canadian Cattlemen's Association (CCA)
(for the Habitat Stewardship Program)
Naturalist Clubs (NAT) (Kingston Field Naturalists, Quinte Field Naturalists Association)
Ontario Nature (ON)
Ontario Ministry of Natural Resources (OMNR)
Canadian Wildlife Service (CWS)
Ontario Federation of Agriculture (OFA)
Lennox and Addington Community Stewardship Council (LACSC)
Hastings Stewardship Council (HSC)
Mohawks of the Bay of Quinte (MBQ)
Ducks Unlimited Canada (DUC)
Ontario Breeding Bird Atlas Regional Coordinator (RC)
Hastings Prince Edward Land Trust (HLT)
Land Conservancy for Kingston, Frontenac, Lennox and Addington (LC)
Landowners- individuals who might assume leadership roles

10.1 Mission Statement

The Napanee Limestone Plain Important Bird Area Working Group will encourage the protection of important bird habitats on the Napanee Limestone Plain by working to maintain, enhance and/or restore grassland ecosystems through conservation, management activities, responsible stewardship, and education.

10.2 Goals and Objectives

Goal 1: Complete habitat mapping and analysis of important functions and features related to significant grassland bird habitat.

Objective: Identify and locate within the IBA, critical or significant habitats and species, and grassland habitats suitable for restoration.

- Secure the necessary resources and leadership to complete the habitat mapping. (ongoing) IBA, CWS, OMNR
- Ensure all maps are GIS compatible. (ongoing) IBA, CWS, OMNR
- Undertake and/or continue surveys and monitoring of Species at Risk. (ongoing) IBA, CWS, OMNR, NAT, RC
- Map all significant natural areas and stewardship properties within the IBA. (high) OMNR, NRAG

Goal 2: Develop protection, management, enhancement, and restoration objectives for the IBA based upon their feasibility, existing habitat structure, requirements of species of concern, land ownership, and current levels of threat.

Objective: Develop and implement strategies to protect private lands of value to grassland birds and other wildlife.

- Coordinate pertinent activities with the Land Conservancy for Kingston, Frontenac, Lennox and Addington and the Hastings Prince Edward Land Trust. (high) IBA, NRAG, LACSC, HSC, HLT, LC landowners
- Identify priority private lands for securement, based on fieldwork and mapping. (ongoing) IBA, NRAG, OMNR
- Secure through a variety of ways (e.g., purchase, conservation easement, written/handshake agreements) priority lands within the IBA. (medium) IBA, LC, HLT
- Initiate landowner contact to communicate goals of the land trust (medium) IBA, land trust when formed. (low) NRAG
- Present IBA conservation plan to local stewardship councils. (high) IBA, ON
- Encourage private land stewardship that protects, maintains, and/or enhances bird conservation (e.g., grazing of livestock and other compatible farm activities to sustain grasslands, land/farm management that minimizes loss of valuable wildlife habitat, birds). (ongoing) IBA, NRAG, LACSC, HSC, DUC, OFA.

Objective: Develop and implement management strategies for private lands.

- Identify through mapping and fieldwork, landowners with grassland habitat of value to grassland birds, particularly Loggerhead Shrike. (ongoing) IBA, NRAG, OMNR, MBQ, LACSC, HSC, DUC
- Identify through mapping and fieldwork, landowners with areas suitable for restoration. (ongoing) IBA, NRAG, OMNR, MBQ, DUC

- Establish priority of properties for grassland management and restoration. (ongoing) IBA, NRAG
- Review related literature, published reports, management plans to identify appropriate management of grasslands in this area for grassland birds of concern. (medium) IBA
- Implement management activities and restoration projects to establish and maintain grasslands. (medium) IBA, NRAG, LACSC, HSC, MBQ, KFN, OMRN, CWS, landowners

Goal 3: Establish and support long-term monitoring and research within the IBA

Objective: Establish and support regular bird monitoring throughout the IBA.

- Establish additional BBS routes through the IBA. (ongoing) NAT, landowners
- Undertake marsh monitoring within the IBA. (ongoing) NAT, DUC, landowners
- Encourage full coverage for the Breeding Bird Atlas within the IBA, including completing all point counts within Breeding Bird Atlas squares within the IBA. (ongoing) RC, NAT
- Develop capacity to collect and store all data on birds at site in one location in a computer database. (medium) IBA, NAT
- Promote species recovery and grassland habitat management research activities. (medium) IBA, CWS, OMNR, NRAG
- Establish release sites for captive bred Loggerhead Shrikes. (ongoing) IBA, NRAG

Goal 4: Develop and conduct educational activities and public relations work that promote understanding of and support for bird conservation and the IBA program and its objectives.

Objective: Raise the profile of IBA designation of the Napanee Limestone Plain through various media outlets and by the provision of information in a variety of forms.

- Install IBA interpretive signs/plaques at strategic and suitable locations within the IBA. (low) IBA, NRAG
- Get the conservation plan on the World Wide Web. (high) IBA
- Include links to the IBA conservation plan on web pages of IBA partners. (medium) IBA
- Develop birding guide to the IBA. (low) NAT
- Produce a video that promotes the IBA and the IBA program to tourist operators, members of local chambers of commerce. (low) IBA, NAT, NRAG
- Promote the showing of the OMNR video about the Loggerhead Shrike in the IBA, to area schools, and to youth and other groups in the area. (ongoing) IBA, OMNR, NRAG

- Assemble a package of information, as a traveling display, about the IBA and the IBA program, for use at a variety of venues (e.g., fall fairs, outdoor shows). (low) IBA, NRAG, OMNR
- Develop press releases about the IBA and IBA program for radio, television, and print media. (low) IBA, NRAG, OMNR

Objective: Develop educational materials about the IBA program, the site, and bird conservation for use by area educational institutions (e.g., schools, community colleges).

- Assemble an educational package of information about the IBA program and site that could be used for both younger people and adults. (low) IBA, NAT, NRAG, OMNR, CWS, ON
- Identify people willing to present a basic education program about the IBA to school groups. (low) NAT, ON, OMNR, LACSC, HSC
- Promote educational opportunities with local school board and other educational institutions. (low) NAT, ON, NRAG, LACSC, HSC

Objective: Promote natural history outings and related events in the IBA.

- Identify birding hotspots and contact landowners in these areas to inform them about future outings and obtain permission to come on their property at time of the outings. (low) IBA, NAT, NRAG, MBQ, area landowners
- Encourage school teachers/boards to consider class outings to selected areas identified above. (low) IBA, NAT, LACSC, HSC, MBQ
- Develop seasonal nature observation/study outings to different ecosystems and habitats in the IBA. (low) NAT, ON
- Conduct organized birding trips (e.g., hikes, car tours) to various parts of the IBA for the public. (ongoing) NAT, ON
- Develop simple checklists/brochure plus map for birds found in the IBA. (medium) NAT
- Print and then distribute these checklists/brochures to suitable outlets (e.g., local chambers of commerce, tourist establishments). (medium) NAT
- Encourage support for annual birding festivals in the region. (low) IBA, NAT, LACSC, HSC
- Promote visitation of the IBA at regional annual birding festivals. (medium) IBA, NAT.

Objective: Encourage the establishment of other bird conservation programs within the IBA.

- Identify other existing bird conservation programs that would be worth developing in the IBA and where necessary, begin finding people to promote, coordinate, or lead these programs on the site. (medium) ON, IBA, LACSC, HSC

Objective: Promote economic benefits of the IBA.

- Present the IBA conservation plan to local tourism or chambers of commerce and relevant municipal and provincial groups. (medium) IBA

- Distribute birding information to local tourist establishments. (medium) NAT
- Promote the IBA at regional annual birding festivals. (medium) NAT
- Prepare an information package to be used to advertise the IBA to tourists (e.g., birders, nature enthusiasts, foreign travelers). (medium) IBA, NRAG, LACSC, HSC
- Develop a birding tour to key spots in the IBA, for travel by vehicle and possibly on footpaths (e.g., the Cataraqui Trail). (low) IBA, NAT, NRAG
- Develop and locate signs that provide identification and direction to and within the IBA. (low) IBA, NAT
- Ask municipal staff to consider using these signs. (low) IBA
- Promote the use of the Camden Lake Provincial Wildlife Area for birding and other nature-based tourism activities. (low) NAT

10.3 Implementation

The IBA Steering Committee will be responsible for the implementation of this conservation plan. If the Committee disbands, then ideally, the Kingston Field Naturalists should assume this role. The IBA Steering Committee should meet annually to review and assess the current status of the conservation plan. More specifically these leaders should discuss the successes and failures to date, upcoming priorities and challenges, new opportunities, and resources (e.g., financial, human). They should also discuss funding of future projects (i.e., identify potential funding sources), inform all partners of potential funding sources, and try to ensure that partners do not compete for the same resources

Potential sources of funding include Nature Canada's Communities in Action program, the Trillium Foundation, the Ontario Stewardship Opportunity Fund, and the Friends of the Environment Fund (TD-Canada Trust). Other potential sources include the Habitat Enhancement Program, the Wetland Fund, the Environmental Farm Plan, Healthy Futures, Healthy Watersheds, and the CFIP/CWIP programs.

11 EVALUATION

This plan represents just the first stage of conservation planning for the Napanee Limestone Plain IBA. It is a work-in-progress. Over time, it will be altered in various ways due to changing conditions, goals, and objectives. For example, some current objectives will be accomplished and new ones will be established. Different approaches or strategies will be required as site conditions, bird populations, threats, and/or land ownership changes. The conservation plan will also be altered as more information and data about the site are collected and analyzed. New challenges will be identified, requiring slightly different objectives and actions. Also members of the IBA Steering Committee may change over time, resulting in some shift of emphasis or priority of some objectives and actions. Finally, funding and support for different initiatives will also vary over the coming years.

Consequently, evaluation of the success of this conservation plan and revision of the plan are necessary and must occur on a regular basis. An annual update on the implementation of the conservation plan actions and strategies would be valuable for CN, ON, BSC, and the stakeholders and should be provided by the IBA Steering Committee. Managers of short-term activities (i.e., seasonal projects, activities lasting only several months) should conduct evaluations upon completion of the project and report findings to the Steering Committee as soon as possible. As objectives are completed, the updated information can be appended to the conservation plan to show the progress that has been made.

Although it is expected that members of the IBA Steering Committee will change over time, a way to oversee the implementation of this conservation plan in the future should be established. Ideally, a group leader should be responsible for this for a predetermined period of time, whereupon another person would take over.

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Appendix A IBA Partner Programs

Canadian BirdLife Partners

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

Nature Canada (NC)

Nature Canada (formerly 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. Nature Canada represents the naturalist community and works closely with provincial, territorial and local affiliated naturalists organizations to directly reach 100,000 Canadians. The strength of their grassroots naturalists' network allows them to work effectively and knowledgeably on national conservation issues that affect a diversity of ecosystems and human populations in Canada. Nature Canada also works in partnership with other environmental organizations, government and industry, wherever possible. Their approach is open and cooperative while remaining firm in their goal of developing ecologically sound solutions to conservation problems. NC's web site 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 2 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/>.

BirdLife International (BLI)

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. BirdLife operates as a partnership of non-governmental conservation organizations, grouped together within geographic regions (e.g. Europe, Africa, 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 web site: <http://www.birdlife.net/>.

Ontario Nature (ON)

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

Ducks Unlimited Canada (DUC)

Ducks Unlimited Canada is a charitable, non-governmental organization dedicated to the increase and perpetuation of North American waterfowl populations through the conservation of wetland ecosystems and associated upland habitats. Its well-developed public education programs also promote a healthy, sustainable environment for both people and wildlife. The DUC website is: www.ducks.ca

Conservation Authorities

Cataraqui Region Conservation Authority (CRCA) manages properties in the IBA near Collins Bay, Odessa Lake, and Bellrock. The Quinte Conservation Authority (QC) manages several properties in the IBA in Tyendinaga Township. Both authorities also provide public education programs concerning their mandate and activities. A variety of interpretive programs for all ages are offered throughout the year. More information about these agencies and the programs and services they offer can be found at: <http://www.pec.on.ca/conservation/> and www.cataraqueiregion.on.ca/

Kingston Field Naturalists (KFN)

The Kingston Field Naturalists, an affiliate of Ontario Nature, is a non-profit charitable organization. Its primary objectives are to stimulate public interest in nature and the protection and preservation of wildlife, and to acquire and provide knowledge of natural history.

The club has many experienced birders familiar with the IBA and members participate in a variety of provincial and local monitoring and survey programs (e.g., Ontario Breeding Bird Atlas, Forest Breeding Bird monitoring, spring and fall roundups, Christmas Bird Count). The club also owns and manages two nature reserves and is actively involved in habitat restoration and improvement projects for several bird species. There are also nature education programs for young people. The KFN website is: <http://kingstonfieldnaturalists.org/>

Volunteer Programs

ON and the Nature Conservancy of Canada (NCC) coordinate the Volunteers for Nature program. BSC, CWS, and/or OMNR run several volunteer programs in Ontario. The following programs are being conducted or will soon be conducted in the Napanee Limestone Plain IBA:

Great Lakes Marsh Monitoring Program (BSC/CWS)

Information about this program can be found at <http://www.bsc-eoc.org/mmpmain.html>

Nocturnal Owl Survey (BSC/CWS)

Information about this program can be found at <http://www.bsc-eoc.org/owls.html>

Canadian Shorebird Conservation Plan (CWS)

In Ontario, this is currently known as the Ontario Shorebird Conservation Plan. More information about this program can be found at http://www.cws-scf.ec.gc.ca/birds/sh_or_e.cfm/

North American Waterfowl Management Plan (CWS)

More information can be found at <http://www.nawmp.ca/>

Breeding Bird Surveys (CWS)

Several breeding bird surveys are conducted annually in the IBA.

Ontario Breeding Bird Atlas (CWS)

A large part of this IBA was included in the first Breeding Bird Atlas and participation in the second Atlas project is also good. Most of the IBA is covered by Atlas volunteers.

Their website is <http://www.birdsontario.org/atlas/atlasmain.html>