



Ontario Eastern Habitat Joint Venture Five-Year Implementation Plan 2006-2010



North American Waterfowl
Management Plan
Plan nord-américain de
gestion de la sauvagine
Plan de Manejo de Aves
Acuáticas de Norteamérica



**Ontario Eastern Habitat Joint Venture
Five-Year Implementation Plan
2006-2010**

Ontario Eastern Habitat Joint Venture Steering Committee

Canadian Wildlife Service – Environment Canada
Ducks Unlimited Canada
Nature Conservancy of Canada
Ontario Ministry of Agriculture, Food and Rural Affairs
Ontario Ministry of Natural Resources
Wildlife Habitat Canada

Citation: Ontario Eastern Habitat Joint Venture. 2007. Ontario Eastern Habitat Joint Venture Five-year Implementation Plan 2006-2010. 94pp.

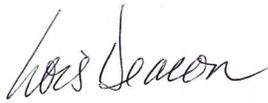
Letter of Transmittal

We are pleased to approve this document which describes implementation of the North American Waterfowl Management Plan and the North American Bird Conservation Initiative in Ontario. This plan reflects the broad interests of all parties to protect and improve the biodiversity of wetland and upland habitats throughout the province of Ontario.

Approved by the members of the Ontario Steering Committee on July 30th, 2007

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Executive Summary

The Ontario Eastern Habitat Joint Venture (OEHJV) was established in 1986 to implement the provincial programs of the *North American Waterfowl Management Plan (NAWMP)*, which focused on the conservation of waterfowl and their wetland ecosystem habitats. More recently, the OEHJV has expanded its mission to include the conservation of all birds and the habitats that support them. This Implementation Plan (IP) is intended to guide the conservation actions of the OEHJV for the next five years. It is also intended to provide information and benchmarks for future planning.

It is important to provide the context for current OEHJV planning efforts. Accordingly, this IP describes the current status of both the habitat and avian resources in Ontario. It is evident that there are serious issues, with habitat continuing to decline in both quantity and quality, particularly in southern parts of the province. Many bird species are in decline, and although the primary cause in some cases can be traced to habitat loss, in other cases the reasons are unclear. In addition, for many bird species there is currently insufficient information to determine population size and trends. Federal and provincial policies and legislation can help to mitigate declines and protect habitats, but on their own they are insufficient.

While issues relating to birds and their habitats may be province-wide, there is a need to focus efforts on the most important areas. The OEHJV has identified a series of priority areas, based on three factors: a breeding and staging habitat assessment, BCR-level habitat and waterfowl assessment and a threat assessment. All priority areas are in the southerly part of the province, with most concentrated in Bird Conservation Region (BCR) 13, the Lower Great Lakes/St. Lawrence Plain, and the remainder occurring in BCR 12, the Boreal Hardwood Transition.

Quantitative objectives have been established for both waterfowl and habitat. Provincial-level benchmarks and objectives are identified for fourteen duck species, one swan species, and one goose species (with three populations). BCR-level benchmarks and objectives are identified for eight duck species and one goose species (with three populations). The analysis of population objectives and limiting factors led to the identification of conservation actions required, which drove the habitat objectives.

There are significantly less data available for waterbirds, landbirds and shorebirds than there are for waterfowl, and the objectives related to these other bird groups reflect this. Planning efforts for these three groups are relatively new, and the OEHJV will focus on integrating objectives identified through the Ontario or BCR level bird conservation plans. Objectives that relate to planning and monitoring dominate, although activities that relate to securement, enhancement and management will also occur. However, at this point no quantitative objectives have been established.

A suite of program activities will be undertaken by OEHJV partners under this IP in order to reach plan objectives. For this IP, the objective is to secure 10,550 acres of wetlands and wetland associated uplands, enhance 9,810 of these acres and manage 478,500 acres of previously secured or enhanced habitat. An additional 500,000 acres are expected to be conserved through stewardship. These habitat conservation activities will occur exclusively within BCRs 12 and 13. Qualitative objectives have been identified for other activities, including evaluation, communications and education and policy adjustment.

Securement activities include purchase and donation of fee title or easement interests, and conservation agreements. Habitat enhancement will involve both wetland restoration and modification of activities on wetland-associated uplands. All lands that are secured will be managed to ensure long-term conservation benefits. Activities that help landowners steward their lands in a manner that conserves wildlife habitat will also occur. Specific actions are also identified for OEHJV partners under communications and education, policy adjustment and reconnaissance and design. Assessment, directed studies and monitoring

activities will take place under the evaluation program, to increase knowledge, ensure that conservation actions are effective, and to direct changes where appropriate. Specific actions related to the three other bird pillars (shorebirds, waterbirds, landbirds) are also identified.

This IP also recognizes that a number of initiatives outside the OEHJV complement OEHJV goals and help achieve OEHJV objectives. Under this IP, a number of these relevant complementary partner programs have been described and will be tracked in the National Tracking System where appropriate.

This IP is ambitious, and will require significant resources. The funding required to achieve waterfowl and habitat objectives over the five-year period is projected to be \$33,890,000. Monetary contributions to achieve IP objectives will be made by OEHJV partners and by several U.S. NAWMP partners.

A critical part of this Plan is its iterative approach, which requires that outcomes be measured and results evaluated. Progress towards habitat objectives will be measured annually, in dollars and acres. Reporting progress towards waterfowl objectives is expected to occur over a 10-year timescale, by measuring Indicated Breeding Pair (IBP) response as a trend over time and linking that change to corresponding changes in waterfowl habitat. Based upon existing science and the adaptive management completed to date that links habitat change to a waterfowl response, it is anticipated that the achievement of the habitat objectives presented in this IP will be successful in producing the desired waterfowl objectives.

Compared to the previous 1994 Implementation Plan, which spanned a 15-year timeframe, this IP will have a relatively short evaluation window, which may equate to a smaller magnitude of accomplishments. Regardless, this linkage of waterfowl numbers to habitat change is the key evaluation element; individual evaluation activities are designed to lead to this result. This IP will be evaluated at its completion, and recommendations will be made for the next plan. The need to nest the next IP within an overall EHJV framework that includes, for example a 25-year waterfowl objective will be considered.

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Acknowledgments

Preparation of this plan involved a collaborative effort between several Ontario Eastern Habitat Joint Venture (OEHJV) partner agencies.

Production of this plan (writing, design, and publication) was funded by the Ontario Ministry of Natural Resources (OMNR), Environment Canada-Canadian Wildlife Service Ontario (CWS), and Ducks Unlimited Canada (DUC).

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Providing overall direction and support for the plan were Steering Committee members: Lois Deacon (OMNR), Ken Ross (CWS), James Duncan (NCC), Ron Maher (DUC), Lynn McIntyre (WHC) and Peter Roberts (OMAFRA).

Acronyms used within this Implementation Plan

ANSI – Area of Natural and Scientific Interest
 APF – Agricultural Policy Framework
 BCR – Bird Conservation Region
 BDJV – Black Duck Joint Venture
 BFOR – Boreal Forest
 BMP – Best/Beneficial Management Practice
 BSC – Bird Studies Canada
 CLAY – Northeastern Clay Belt
 CLTIP – Conservation Land Tax Incentive Program
 COA – Canada-Ontario Agreement respecting the Great Lakes Basin Ecosystem
 COSEWIC – Committee of the Status of Endangered Wildlife in Canada
 CWI – Canadian Wetland Inventory
 CWS – Canadian Wildlife Service - Environment Canada
 DUC – Ducks Unlimited Canada
 DUI – Ducks Unlimited Inc.
 E - Existing
 EGS – Ecological Goods and Services
 EHJV – Eastern Habitat Joint Venture
 ESA – Endangered Species Act
 FMPM – Forest Management Planning Manual
 FNCC – Friends of the Nature Conservancy of Canada Inc
 GIS – Geographic Information Systems
 GLCWC – Great Lakes Coastal Wetland Consortium
 GLSL – Great Lakes St. Lawrence
 GLWCAP – Great Lakes Wetlands Conservation Action Plan
 HADD – Harmful Alteration Disruption or Destruction (of fish habitat)
 HBLD – Hudson Bay Lowland
 HEN – Habitat Evaluation Network
 IBA – Important Bird Area
 IBP – Indicated Breeding Pair
 IP – Implementation Plan
 JV – Joint Venture
 KPA – Key Program Area
 LRTAP – Long Range Transport of Atmospheric Pollutants
 LPWWRF – Long Point Waterfowl and Wetlands Research Fund
 M - Million
 MBS – Migratory Bird Sanctuary
 MES – Mallard Ecology Study
 MFTIP – Managed Forest Tax Incentive Program
 MVP – Mississippi Valley Population
 MWA – Managed Wildlife Area
 NABCI – North American Bird Conservation Initiative
 NAWCA – North American Wetlands Conservation Act
 NAWMP – North American Waterfowl Management Plan
 NCC – Nature Conservancy of Canada
 NGO – Non-governmental Organization
 NTS – National Tracking System

NWA – National Wildlife Area
OEHJV – Ontario Eastern Habitat Joint Venture
OLCP – Ontario Landbird Conservation Plan
OMAFRA – Ontario Ministry of Agriculture, Food and Rural Affairs
OMNR – Ontario Ministry of Natural Resources
P - Proposed
PHJV – Prairie Habitat Joint Venture
PIF – Partners in Flight
PPS – Provincial Policy Statement
SARA – Species at Risk Act
SJBP – Southern James Bay Population
SOLEC – State of the Lakes Ecosystem Conference
SOLRIS – Southern Ontario Land Resource Information System
SORR – State of the Resource Reporting
TBD – To Be Determined
USFWS – United States Fish and Wildlife Service
WCR – Waterfowl Conservation Region
WDRP – Wetland Drain Restoration Project
WMA – Wildlife Management Area
WHC – Wildlife Habitat Canada
WNV – West Nile virus
WUD – Waterfowl Use Days

1. Introduction and Background

The Eastern Habitat Joint Venture (EHJV) was established in 1986 to deliver on the goals of the North American Waterfowl Management Plan (NAWMP). While NAWMP established continental goals, and actions began immediately, it became necessary to develop regionally-specific implementation plans for more efficient and effective delivery. The Ontario-EHJV (OEHJV) developed its first formal implementation plan in 1994, which laid out specific goals and objectives for waterfowl and their habitat for the province of Ontario. Later, the North American Bird Conservation Initiative (NABCI) brought attention to the need for the conservation of all North American birds and their habitats, and the EHJV broadened its mandate to include this. With this broader mandate, and with the knowledge gained from 20 years of research, implementation and evaluation, the OEHJV embarked on the development of this new Implementation Plan for 2006-2010.

1.1 North American Waterfowl Management Plan

NAWMP was originally created in 1986 in reaction to critically low numbers of waterfowl. It established a continental vision and set of principles, to “sustain abundant waterfowl populations by conserving landscapes through partnerships that are guided by sound science”. NAWMP’s biological foundation is based on waterfowl objectives, habitat objectives, and an understanding of the ecological links between them. Waterfowl population objectives are based on historical abundances of each species, and consensus among waterfowl stakeholders about waterfowl numbers required to ensure population viability while considering harvest impacts and other factors such as public enjoyment. In addition, objectives incorporate an understanding of habitat conditions required to reach target waterfowl populations.

Canada and the U.S. were the original signatories to the plan; Mexico joined in 1994, making the plan truly continental in scope. A broad range of participants are involved in implementing the plan: NAWMP is a partnership of federal, provincial/state and municipal governments, non-governmental organizations, private companies and many individuals, all working towards achieving better wetland habitat for the benefit of waterfowl, other wetland-dependant species and people.

NAWMP was updated in 1994, 1998, and renewed in 2004, when a new 15-year implementation cycle was established. In 2005, an extensive, continental assessment of the NAWMP was undertaken to examine the extent to which waterfowl populations in North America have benefited from efforts conducted under NAWMP’s guidance. The recent results of this assessment are helping to identify top priorities for future waterfowl conservation efforts, and in so doing, guiding Joint Venture-level planning. The NAWMP updates and assessment have helped guide the development of this OEHJV Implementation Plan (IP).

One of the keys to the success of NAWMP is the funding that has been provided under the *North American Wetlands Conservation Act* (NAWCA). This is an important piece of U.S. legislation that facilitates the transfer of U.S. government and non-government funds into both Canada and Mexico in support of wetland conservation efforts, which underpin NAWMP.

1.2 North American Bird Conservation Initiative

NABCI was established in 1999 through a council resolution of the Commission for Environmental Cooperation, which was endorsed by all three member governments (U.S., Canada and Mexico). It aims to ensure that populations and habitats of North America's native birds are protected, restored and enhanced through coordinated efforts at international, national, regional and local levels, guided by sound science and effective management.

A Declaration of Intent for the Conservation of North American Birds and their Habitat was signed in 2005 by all three countries. This declaration formally established a purpose, objectives and governance for a high-level implementation framework. The purpose is “to cooperate to conserve native North American birds throughout their ranges and habitats, and ultimately collaborate with all Participant nations regarding bird conservation”.

NABCI was designed to increase the effectiveness of existing and new initiatives through effective coordination, building on existing regional partnerships such as the Joint Ventures established under NAWMP, and fostering greater cooperation among the nations and the peoples of the continent. It established four bird groupings, called ‘pillars’, for the purposes of conservation planning and implementation: waterfowl, waterbirds, shorebirds and landbirds.

1.3 Eastern Habitat Joint Venture

Throughout the continent, the NAWMP established regional partnerships, called Joint Ventures (JVs), to undertake conservation projects. The EHJV is one of these regional partnerships, covering Ontario, Québec, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador. It was formally established in November, 1989, with the signing of the EHJV Implementation Agreement.

The EHJV is one of seventeen habitat joint ventures in North America, and the largest at nearly three million square kilometers. It contains extensive wetland systems and a number of critical breeding and staging habitats for many species of waterfowl, including breeding habitat for approximately 80% of the continental American black duck (hereafter referred to as black duck) population.¹

The EHJV is governed by a Management Board, which provides strategic direction to the provincial Steering Committees. Partners on the Board include the governments of Canada, Ontario, Québec and the four Atlantic Provinces, Ducks Unlimited Canada, Wildlife Habitat Canada, the Nature Conservancy of Canada and Bird Studies Canada.

Initially developed to implement NAWMP, the EHJV continues to focus on NAWMP as a key priority. However, the JV has now expanded its focus to incorporate the vision of NABCI. To meet the new challenges, the EHJV has modified its goal and objective to include all bird habitats:

- Goal: *To work cooperatively and in concert with new and existing partners to ensure the conservation of all bird species and their habitats at the landscape and local levels within EHJV boundaries through the implementation of plans developed in full consideration of the biological needs of all species.*
- Objective: *To manage all bird populations and habitats within the context of sustainable landscape management, while respecting the needs of people and wildlife, through a partnership of government, nongovernmental groups, corporations and individuals.*

In addition, to incorporate NABCI into its activities, the EHJV developed a five-year strategic plan, *A Strategic Framework for the Delivery of the Eastern Habitat Joint Venture Partnership 2004 to 2009*, to guide provincial activities at a strategic level.

¹ For more information on habitat and avian resources in Ontario, see Section 2.

The Four Bird Pillars

Waterfowl (ducks, geese, swans)

Waterbirds (gulls, terns, bitterns, loons, grebes, herons, rails, moorhens, coots, cranes, cormorants, pelicans)

Shorebirds (sandpipers, plovers, phalaropes, etc)

Landbirds (hawks, eagles, falcons, partridges, grouse, quail, pigeons, doves, cuckoos, owls, swifts, hummingbirds, kingfishers, woodpeckers, passerines)

1.4 Ontario Eastern Habitat Joint Venture

While the EHJV established broad strategic direction, each province within the JV agreed to develop and implement its own EHJV program. In 1988, in order to get NAWMP underway and to demonstrate international partnerships in action, seven First Step projects were initiated across Canada, including Matchedash Bay in Ontario. The Matchedash Bay project, located at the southeast end of Severn Sound on Georgian Bay, was chosen because it was a high risk area for wetland habitat loss, had high potential for production of waterfowl and other wetland-dependent wildlife, is a critical staging area for migrating waterfowl, and development and management of this area for waterfowl was highly compatible with other existing wetland values and uses. The completion of this flagship project demonstrated the effectiveness of partnerships because no single partner would have had the resources to complete the project alone.

By 1994, partners had completed the *Ontario Implementation Plan for the Eastern Habitat Joint Venture of the North American Waterfowl Management Plan* which outlined in a comprehensive and detailed manner the programs that Ontario would use to collectively achieve OEHJV's objectives related to NAWMP over a 15-year timeframe.

OEHJV partners - Ducks Unlimited Canada (DUC), Nature Conservancy of Canada (NCC), Wildlife Habitat Canada (WHC), Environment Canada-Canadian Wildlife Service (CWS), Ontario Ministry of Natural Resources (OMNR), Ontario Ministry of Agriculture and Rural Affairs (OMAFRA) - signed a new Implementation Agreement in 2005 which re-committed the partners to coordinating the implementation of EHJV activities in the province over the next 10 years. The Agreement also defined the governance structures and agency roles of the OEHJV². To inform OEHJV planning processes, the OEHJV Technical Committee (TC) was revived and new members were invited to participate. The TC now includes representatives from CWS, OMNR, NCC, DUC, OMAFRA and Bird Studies Canada (BSC). The TC provides sound scientific advice and guidance with respect to the activities of the OEHJV partnership, including setting research, monitoring and evaluation priorities.

OEHJV programs have been extremely successful. Through the efforts of all partners, almost 500,000 acres of wildlife habitat were conserved from 1986 to 2004. Over \$130 million has been spent in Ontario to conserve, restore, enhance and manage wetland habitats in the province. By 2004, OEHJV partners had made significant inroads on the objectives from the 1994 Implementation Plan, reaching approximately 72% of securement objectives, 83% of enhancement objectives, and 87% of influence objectives.² The majority of these accomplishments occurred in the Great Lakes St. Lawrence Key Program Area, the highest priority landscape in the province.

Despite significant progress, partners recognize that there is a continued need to protect wetlands in Ontario. This 2006-2010 IP is a renewal of the OEHJV commitment to waterfowl and wetland conservation under NAWMP, and it incorporates important outcomes and recommendations from the 2005 NAWMP Continental Assessment. Utilizing information and experience gained over the last 15 years, new waterfowl population and requisite habitat objectives have been established. This IP is also an important step towards integrating priorities and conservation actions from shorebird, waterbird and landbird plans, for a truly coordinated approach to bird conservation in the province.

In keeping with the joint venture's expanded scope, the OEHJV adopted new guiding principles and goals prior to developing this plan:

²See Appendix 1 for OEHJV governance and Appendix 2 for detailed OEHJV accomplishments.

OEHJV Guiding Principles 2006-2010

- Program delivery will be achieved through partnership.
- Sound scientific practices must underlay all activities to ensure a good understanding of natural and ecological systems and how our actions affect them.
- Programs will be prioritized to ensure that efforts are directed towards the geographic area and species that are the most limited or the most threatened.
- Recognition that the critical needs of many birds extend beyond Ontario's planning area should foster inter-jurisdictional cooperation.
- Linkages among government agencies, non-governmental organizations, industry, landowners and individuals must be built upon and strengthened.
- Sustainable land use and management practices that are compatible with bird conservation will be promoted.
- A landscape or ecosystem approach should be applied when conducting any bird or habitat conservation or planning activity.
- A precautionary approach should be used when faced with uncertainty.
- Activities must be evaluated regularly to ensure that programs continually improve via adaptive management models.
- Securement, habitat enhancement, restoration and management are important aspects of resource stewardship.
- Conservation objectives will focus on maintaining population levels of common native birds, acquisition and/or enhancement of high quality habitats and recovery of Species at Risk.

OEHJV Goals

- Protect and restore the ecological integrity and biological function of high quality habitats in order to maintain and/or increase native waterfowl and other bird populations.
- Promote ecologically sound and sustainable landscape uses that meet the needs of birds, other wildlife and people.
- Promote and strengthen linkages among other habitat and species joint ventures, government agencies, non-governmental organizations, industry, landowners and individuals for the benefit of habitat conservation.

1.5 1994 Implementation Plan

The 2006-2010 Implementation Plan (IP) recognizes past successes and builds on previous work, in particular taking guidance from the *1994 Ontario Implementation Plan for the Eastern Habitat Joint Venture of the North American Waterfowl Management Plan*. That IP set the framework for moving forward on NAWMP, and much of the direction from that IP remains relevant today.

The 1994 IP described the four Key Program Areas, and set out priorities. It identified both habitat acreage and waterfowl population objectives, based on the best available science, and described programs and techniques to be used to reach those objectives. It recognized that a range of direct and indirect actions, from land purchase and on-the-ground enhancement to policy influence, would be necessary.

As successful as the 1994 IP was, it was intended to have a limited shelf-life; as new information became available, key aspects would have to be revised and a new implementation plan developed. This new 2006-2010 IP uses results from the 2005 Continental NAWMP Assessment and the best available science to establish new priorities and objectives, programs and conservation actions.

2. Plan Context

The development of a practical and effective IP that addresses the conservation of birds and their habitats requires that many factors be taken into account. Most obviously, the current status of bird populations and habitats, as well as trends, when known, must be considered. However, it is also important to consider the policy context in which conservation actions will occur.

2.1 Habitat Resources in Ontario

One of the main factors affecting bird populations is the habitat on which they depend. Historically the OEHJV has focused on waterfowl, and therefore efforts have been directed towards wetland ecosystems, including wetland-associated uplands. With the broader focus on all bird species, all upland habitats are now being addressed to the extent that new partners and funding are available.

Description and Status of Wetlands

Wetlands – marshes, fens, bogs and swamps – are among the most productive and biologically diverse habitats on earth and are an essential component of healthy natural ecosystems. Wetlands provide critical habitat – food, space, shelter, movement corridors – for a wide variety of plant and wildlife species, including migrating waterfowl, waterbirds, shorebirds and landbirds, and numerous species at risk. Wetlands provide habitat for approximately 600 wildlife species in North America, more than 400 wildlife species in Canada, over 300 species of plants in Lake Erie coastal wetlands and about 47 species at risk in Ontario.

Wetlands cover a significant part of Ontario; estimates range from 24 to 27 million hectares, or over 22% of the province's land base. Almost 40% of these wetlands are represented as marshes or open (un-treed) bogs and fens. Approximately 9% of wetlands in the province are found in protected areas, primarily located in northern areas of the province. Ontario's wetlands account for an estimated 24% of Canada's wetlands and approximately 6% of the world's wetlands.

However, wetland losses in parts of the province have been severe. Prior to European settlement, vast swamp-marsh wetlands occurred in flat lowland areas across the province. Before 1800, 2.38 million hectares of wetland were widely distributed throughout southern Ontario³. By 1982, only 0.93 million hectares remained, mostly in northerly reaches of southern Ontario. The original wetland area in southern Ontario had been reduced by 68%. Wetland decline since settlement has been most severe in southwestern Ontario where over 90% of the original wetlands have been converted to other uses. Areas in the Niagara Peninsula, along western Lake Ontario and in eastern Ontario have less than 20% of the original wetland area remaining.

Great Lakes coastal wetlands are unique habitats. In addition to providing continentally significant habitat for large numbers and species of migratory waterfowl, Great Lakes coastal wetlands provide important habitat for many globally rare species and vegetation communities. Many of Ontario's lake fish species spawn in Great Lakes coastal wetlands. An estimated 50% of Great Lakes wetlands have been lost basin-wide. Losses of up to 90% have occurred in some areas. Currently, 216,743 hectares of coastal wetlands have been identified along the Canadian and U.S. sides of the Great Lakes and connecting rivers up to Cornwall, Ontario, although the inventory is not yet complete. An estimated 1,081 wetlands have been

³ For the purposes of this Plan, "Southern Ontario" refers to the area of the province roughly corresponding to the Ontario portion of BCR 13.

identified on the Canadian side. These wetlands represent approximately 63,520 hectares of waterfowl habitat.

Although wetland losses continue to be a serious concern, the amount of wintering habitat has recently been increasing. Wintering habitats associated with the Niagara, Detroit and St. Clair Rivers have been augmented by ice-free sections within the Great Lakes themselves. The more consistently available open water habitat has provided increased over-wintering opportunities for waterfowl, especially divers.

Description of Uplands in Ontario

At the time of first lands surveys in the late 1700s and early 1800s, over 90% of southern Ontario was covered by deciduous and mixed woodlands, including forest and shrubs, and successional habitats; more than 70% of this was upland forest. Open alvar, prairie and savannah habitats occupied at least 1.3% of the upland areas in southern Ontario, including at least 800 square kilometres of tallgrass prairie. Small patches of rock barrens, cliff, shoreline and dune habitats were also present.

Upland losses have been as significant as wetland losses. Forests now make up approximately 56.8 million hectares (about 53%) of the province's land base. Fields and agricultural land comprise about 5.5 million hectares (about 5%) of the province. Studies have estimated that, in southern Ontario, approximately 97% of prairie and savannah habitat and about 94% of original woodlands have been lost. Current upland cover in southern Ontario is estimated at 2.1 million hectares (26.1%) of forest and 4.8 million hectares (60.3%) of field/agriculture.

Wetland-Associated Uplands

Uplands can be considered associated with a wetland through ecological or biological links. "Wetland-associated upland" usually refers to areas directly adjacent to a wetland, but lands further away can also directly impact the quality of a wetland, through the capture and provision of surface and groundwater for example. Surface water in wetlands and ground water in the surrounding uplands are related in a complex manner; frequently the wetland's surface water is dependent upon the upland's ground water. Uplands can also be considered wetland-associated if the uplands play an important role in providing habitat for wetland-associated species. Wetland-associated uplands can include many landscape types, including forests, fields and riparian areas.

It is important to remember the principles of connectivity in a landscape when managing and planning for wetlands. Wetland ecosystems are part of larger natural systems and are functionally linked to surrounding upland habitat and the watershed within which they occur. "Healthy" watersheds have a good percentage of wetlands, woodlands and riparian zones, well distributed throughout the system. The amount of natural habitat that is located adjacent to wetlands can be particularly important to the maintenance of wetland functions and attributes. These adjacent lands are often referred to as "buffers", but in many cases they form an intrinsic part of the wetland ecosystem, providing a variety of habitat functions for wetland-associated fauna that extend beyond the wetland limit.

Many waterfowl species nest in the uplands around wetlands, whether in agricultural fields, natural grasslands or in hollowed cavities in trees adjacent to wetlands. Conserving a wetland therefore also requires protecting some portion of the landscape that surrounds it. These areas are critical for other wetland dependent wildlife species as well. For example, many turtle species, dependent on the wetland for food and shelter, actually nest in nearby upland areas. Some studies indicate that disrupting adjacent upland areas threatens to reduce wetland biodiversity to the same extent as losing half of the wetland itself.

Other Uplands

“Uplands” refers to habitats that are not associated with wetland areas, and may include forests, grasslands, shrubby and successional habitats. Ontario encompasses a wide variety of upland habitats, ranging from those found in Carolinian areas to those found in mixed grassland plains, mixed coniferous forests, boreal forests, and finally to those found in the sparsely vegetated taiga and lowland regions in the far north.

The southern portion of the province supports a variety of upland habitats, including agricultural areas, grasslands, mixed plains and forests. The Great Lakes pose a migration obstacle for birds but key promontories act as important migration corridors that are essential for birds during spring and fall migration. Towards the central and northern areas of the province the landscape moves into mixed plain and forested areas, including deciduous, mixed and coniferous forests. The far north consists of remote forested areas, transitioning from boreal forest into taiga and the lowlands adjacent to the James and Hudson Bay coasts. These areas provide important nesting habitat for waterfowl and shorebirds that migrate in and out of the region during the short breeding season. Likewise, the boreal ecosystem, which stretches across Canada, is considered to be critical breeding habitat for many species of insectivorous birds.

2.2 Avian Resources in Ontario

Knowledge about current avian resources in Ontario, including population trends, is critical for the development of conservation plans. The state of knowledge varies for different species groups for a number of reasons, but the best available data is evaluated for this IP.⁴

Description and Status Of Breeding Waterfowl

Thirty-one species of waterfowl occur in Ontario. The average spring breeding waterfowl population is estimated to be 3.1 million birds (2.1 million ducks, 1.0 million geese and 2,000 swans). Provincially, total numbers of breeding waterfowl continue to increase, largely on the basis of the rise of temperate breeding Canada geese. However, most other species are stable and a few are declining.⁵

The most common species of dabbling duck breeding in Ontario is the mallard, followed by the American black duck and the wood duck. The breeding population of mallards continues to increase slowly within the province, while that of wood ducks remains stable; blue-winged teal numbers continue a decline started in the 1970's. The black duck population increased during the 1990's but in recent years has resumed a slow decline.

The American black duck was once much more abundant in Ontario, particularly in the south, but populations have declined since the 1960s making it a rare breeder south of the Shield. The recent continuation of this trend now centred in central Ontario is concerning. Reasons are not clear but may involve habitat factors affecting hen population or interspecific competition with mallards for breeding habitat particularly in agricultural landscapes.

The blue-winged teal population decline is also of concern, in Ontario and throughout the Great Lakes Basin. Breeding habitat has changed as agriculture has gradually shifted away from less intensive

⁴ For more information on each of the four bird groups in Ontario, see the *North American Waterfowl Management Plan – 2004 Update*, the *Ontario Shorebird Conservation Plan*, the *Ontario Landbird Conservation Plans* (BCR 8, 12, 13), the *Upper Mississippi – Lower Great Lakes Waterbird Conservation Plan* and the draft *Ontario Waterbird Conservation Plan*.

⁵ See Table 1, for additional population and trend information.

activities, with an abundance of pasture land, to more intensive row cropping. Plentiful productive seasonal wetlands that historically were associated with pasture land have declined in concert with blue-winged teal populations.

Ring-necked duck, common merganser and common goldeneye are the three most abundant diving duck species breeding in the province, followed by the hooded merganser of which Ontario supports more than half of the world's breeding population. All are at least stable in their populations and may in fact be slowly increasing. The remainder of the province's predominant breeding diving duck species exhibit stable populations.

The lesser scaup, which has shown significant continental population declines, breeds in substantial numbers in the Hudson Bay lowlands (population estimate of 27,000 breeding pairs in Ontario). The bufflehead is the smallest of sea ducks and nests in low densities in Ontario's boreal forest and the Hudson Bay lowlands, and now appears to be extending its range into the northern Great Lakes. The three species of scoters (black, surf and white-wing) all breed in the Hudson Bay Lowlands although their populations are not adequately quantified and trend information is not yet available. Small numbers of common eiders also breed along parts of the coast there, and individual pairs of king eiders have occasionally been recorded around Cape Henrietta Maria.

Three distinct populations of Canada geese breed in the province and with exception of the stable population trend of the Mississippi Valley populations, all others are increasing. The southern James Bay population, recently on the decline, has rebounded in the past several years. The temperate breeding population found throughout southern portions of the province continues to exploit new habitats and increase exponentially, particularly in the Lower Great Lakes/St Lawrence Plain region. The mid-continent population of the lesser snow goose is the province's most common breeding light goose and at present has a stable population in Ontario. Brant do not breed in Ontario but do use the James and Hudson Bay coasts as a crucial spring and fall staging area for a large part of the eastern Arctic breeding population.

Ontario hosts three species of breeding swans, the tundra, trumpeter and mute, and all species have been observed to be on the increase. The mute swan, is a species not indigenous to Canada, exhibits a rapidly increasing population as it exploits habitat niches throughout North America. The trumpeter swan is not considered native to Ontario. As such, only a population objective has been proposed for the tundra swan.

Description and Status of Landbirds

Ontario is home to a variety of landbird assemblages. In the south there is a high diversity of landbirds resulting from several distinct biomes, including Carolinian forest, eastern deciduous forest, northern mixed forest, western grasslands, and urban settings. Critical staging habitat is provided at key sites along the Great Lakes. Birds stop at these sites to refuel during migration. Promontories provide key locations where landbirds funnel across the Great Lakes at locations where the distance of travel over water will be minimized. Many of these sites are banding and migratory research stations that provide key information on migration trends.

In the central and northern parts of Ontario, the boreal forest region is critical for sustaining the avifauna of North America because of the large numbers and variety of landbirds that nest there. The boreal forest is particularly important for warblers; Ontario contributes habitat for significant portions of the global population of several warbler species.

In the north, there is a critical need for bird monitoring data. Data are lacking because of the inaccessibility and large size of the area. As data are available only for small portions of the available

habitat, it is difficult to obtain accurate counts or estimates of population sizes, species composition and trends.

Description and Status of Shorebirds

Ontario provides vitally important staging and breeding habitat for western hemisphere shorebirds. Of twenty-nine shorebird species commonly occurring in Ontario, major staging concentrations of fourteen species amass in the hundreds of thousands. Twenty-two of forty species that breed routinely in Canada regularly breed in Ontario, including significant proportions of the populations of seven species, some of which are species of concern, such as the Hudsonian and marbled godwits. Killdeer, spotted sandpiper and common snipe are the most common and widespread species, being found throughout the province.

Ontario environments play a significant role in the annual lifecycle of shorebirds, with respect to both migrating and breeding components of their populations. In the north, the shorelines of James Bay and Hudson Bay provide major migration routes and staging sites for arctic-nesting species including the *rufa* population of the red knot, presently being assessed for species at risk status. Much of these shoreline areas now receive protection in Polar Bear Provincial Park, but large areas still lack any protection other than that provided by inaccessibility. In southern Ontario there are also significant habitats, mostly along the Great Lakes shorelines. However, shorebirds do not congregate at these sites in large assemblages, and determining the collective benefit of many sites that host a small number of birds has been challenging.

Description and Status of Waterbirds

Ontario provides a variety of nesting, roosting and foraging habitats for waterbirds, including marshbirds. Thirty-one species breed here, including loons, grebes, pelicans, cormorants, herons, night-herons, egrets, bitterns, rails, moorhens, coots, cranes, gulls and terns.

There is limited information on waterbird use of a number of habitats in Ontario. The islands and coastal marshes of the Great Lakes provide key nesting and migratory habitat; threats are most severe to southern Great Lakes habitats. Inland areas, including small lakes and wetlands, also provide a network of nesting habitat for colonial waterbirds and marshbirds; however, the extent of utilization of these areas outside of the Great Lakes Basin is not well understood. In addition, because the birds do not occur in large congregations, censusing these species is challenging and the collective benefit of these multiple sites has not been assessed systematically.

Within the boreal forest there is limited information on habitat use by colonial waterbirds and marshbirds, but it is believed that lakes, shorelines, marshes and extensive bog and fen areas provide large amounts of habitat.

2.3 Policy Context for Wetland Conservation

Within the context of OEHJV activities, “policy” is considered to include legislation, programs and policies of the federal, provincial or municipal governments that affect land use directly or indirectly. There are a number of major policies that influence wetland conservation in Ontario. Government policies have the potential to support the protection of existing habitats and the restoration of others. Ontario’s avian populations can only be maintained, in part, through the provision of adequate quality and quantity of both wetland and upland habitat that supports their life cycle (i.e., for breeding, staging and wintering). The OEHJV must work within existing policy frameworks, promoting the positive results of beneficial policies, while working in partnership to advance changes that support conservation efforts. Following is a brief description of current policies.

Provincial Government Policies

The *Provincial Policy Statement* (PPS), authorized under the *Planning Act*, identifies “matters of provincial interest” that are related to land use planning and development, and as such, provides a policy framework for regulating development and land use. On March 1, 2005, the Province of Ontario released an updated version the PPS, which now prohibits development and site alteration (during planning matters) in provincially significant wetlands throughout most of the Lower Great Lakes/St Lawrence Plain BCR, or in any provincially significant Great Lakes coastal wetland. Development within provincially significant wetlands in the rest of the province must demonstrate no negative impacts on the wetland’s natural features or ecological functions. Implementation of the PPS occurs through municipal official plans and zoning by-laws at both the upper and lower tiers of local government.

In addition to protecting significant wetlands, the Natural Heritage policies contained in the PPS include a number of individual components that contribute to the conservation of wetlands and the species that rely on them. PPS policies also prohibit negative impacts from development and site alteration in a) significant habitat of threatened and endangered species, b) significant wildlife habitat, c) significant woodlands south and east of the Canadian Shield, d) significant valleylands south and east of the Canadian Shield, and e) significant Areas of Natural and Scientific Interest (ANSI). Lands adjacent to provincially significant wetlands are also subject to special planning considerations under the PPS. Local planning authorities may approve policies that go beyond the minimum standards of the PPS. Several municipalities have protected all evaluated wetlands within their jurisdiction.

Wetland conservation is also featured in a number of regional, landscape-scale land use plans, including the *Niagara Escarpment Plan*, *Oak Ridges Moraine Conservation Plan*, and the *Greenbelt Plan*. These plans provide protection to all wetlands and require the establishment of protective minimum vegetative buffers. Wetland protection within these areas provides an incipient step in enhancing wetland securement to other geographic regions of the province.

The *Conservation Authorities Act* is a provincial statute that includes provisions for the protection of wetlands. Ontario Regulation 97/04 allows conservation authorities to prohibit, regulate or provide permission for development activities that have a potential to impact the hydrological function of existing wetlands.

Wetlands and other naturally vegetated areas such as woodlands and riparian areas can help protect drinking water sources by trapping sediments and soils, and altering or reducing contaminants, nutrients and some pathogens before they are introduced to surface and ground water sources. Ontario has introduced numerous new pieces of legislation and regulations that protect drinking water resources and have the potential to also protect wetlands. These include the *Clean Water Act*, the *Safe Drinking Water*

Act, the Sustainable Water and Sewage Systems Act, the Drinking Water Systems Regulation, and the Nutrient Management Act.

A new *Provincial Parks and Conservation Reserves Act*, which recognizes ecological integrity as a key priority, received Royal Assent in Ontario in June, 2006. Provincial parks and conservation reserves provide long-term habitat protection by prohibiting many detrimental activities. Wetlands and other habitats within protected areas are also important areas for research and monitoring, as well as providing numerous opportunities for public outreach and education.

The forested landscapes of the Lower Great Lakes/St. Lawrence Plain, Taiga Shield and Hudson Plains, and particularly the Boreal Forest, provide significant habitat for many of Ontario's waterfowl and other bird species. The management of these landscapes has the potential to affect wetland abundance and productivity (mainly through the impact on beaver populations), and the availability of cavity nesting sites. Under the *Crown Forest Sustainability Act*, when undertaking forest operations on Crown land (which includes the vast majority of forested lands in Ontario), a Forest Management Plan must be prepared in accordance with the Forest Management Planning Manual (FMPM), which states that evaluated wetlands must be shown on Forest Values Maps. Forest management guidelines supplement information in the FMPM and include specific direction to forest managers regarding natural values when undertaking harvest operations.

Several statutes protect wetlands while also fostering a strong private land stewardship ethic. The *Assessment Act* enables property tax reductions or exemptions for landowners for a variety of purposes, including the conservation of natural resources. Through the Conservation Land Tax Incentive Program under the *Assessment Act*, partial or full property tax exemptions are offered to private landowners and charitable conservation organizations that agree to protect designated natural heritage features such as significant wetlands. The *Conservation Land Act* enables the granting of conservation easements and the establishment of covenants on property titles for conservation purposes.

The *Endangered Species Act* (ESA) provides for the conservation, protection, restoration or propagation of species of flora and fauna that are threatened with extinction in Ontario. Several species regulated as Endangered under the ESA are obligate or facultative wetland specialists.

Federal Government Policies

The *Federal Policy on Wetlands Conservation* promotes the conservation of Canada's wetlands to sustain their ecological and socio-economic functions, by supporting the conservation of wetlands. The Policy outlines seven strategies to provide for the use and management of wetlands so that they can continue to provide a broad range of functions on a sustainable basis. These strategies include: 1) Developing public awareness, 2) Managing wetlands on federal lands and waters and in other federal programs, 3) Promoting wetland conservation in federal protected areas, 4) Enhancing cooperation, 5) Conserving wetlands of significance to Canadians, 6) Ensuring a sound scientific basis for policy, and 7) Promoting international actions.

Policies on the Web

Many of the provincial and federal policies discussed in Section 2.3 can be viewed on the following websites:

Federal:

<http://laws.justice.gc.ca/>

Provincial:

<http://www.e-laws.gov.on.ca/>

The *Fisheries Act* is also an effective tool for the protection of wetlands because of the value of wetlands as fish habitat. Provisions for the protection of fish and fish habitat allow development projects to occur while providing for the protection of fish and fish habitat. Section 35 of the Act, which prohibits the Harmful Alteration, Disruption or Destruction (HADD) of fish habitat, can often be used for wetland protection.

The *Migratory Birds Convention Act* implements a Convention for the protection of migratory birds in Canada and the United States. The objectives of the Act are to manage migratory birds while ensuring sustainable use of hunted species, to provide for and protect habitat necessary for the conservation of migratory birds and to restore depleted populations of migratory birds. The required monitoring and research of avian populations and their habitats, and the establishment of annual hunting season dates and bag and possession limits, are carried out under the auspices of this Act.

The *Canada Wildlife Act* and the *National Parks Act* both provide authority for the acquisition of lands by the Minister of the Environment for the purposes of wildlife research, conservation and interpretation. National Wildlife Areas are created and managed pursuant to regulations made under the *Canada Wildlife Act*. Designation as a National Wildlife Area (NWA) and Migratory Bird Sanctuary (MBS) helps to ensure that lands of national importance are protected. In Ontario, both the *Canada Wildlife Act* and the *National Parks Act* have been used to secure continentally important waterfowl staging habitats along the Great Lakes shoreline, the St. Lawrence River and the Hudson and James Bay coastline.

The *Species at Risk Act* (SARA), which was proclaimed in 2003, expands the scope for applying NWA and Managed Wildlife Area (MWA) status, to include the protection of wildlife habitat on privately owned lands. The purposes of the SARA are to prevent Canadian indigenous species, subspecies and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and to encourage the management of other species to prevent them from becoming at risk. The protection of wetland and upland habitats that are inhabited by at-risk species will benefit waterfowl and other avian species.

The primary *Federal Water Policy* objective is to encourage the use of freshwater in an efficient and equitable manner consistent with the social, economic and environmental needs of present and future generations. The Policy contains many policy statements, which includes a wetland preservation statement used to protect wetlands from loss and degradation.

The *Agricultural Policy Framework* (APF) is a national framework for agricultural policy in Canada that was formulated by the Government of Canada in conjunction with provincial and territorial governments as well as other agricultural stakeholders. The APF “will support greater profits in the agricultural sector by ensuring it is positioned as the world leader in food safety, innovation, and environmentally responsible production. Considerable benefits for Canadians through the promotion of environmental stewardship and more complete food safety and food quality assurance systems are also anticipated”. There are five ‘Pillars’ within the APF: 1) Environment, 2) Business Risk Management, 3) Food Quality & Food Safety, 4) Renewal, and 5) Science & Technology. Within the Environment pillar, farmers can access both technical and financial assistance to implement Beneficial Management Practices through the successful completion of an appropriate Environmental Farm Plan. There are currently three cost-share programs available to qualifying farmers in Ontario, including the Farm Stewardship Program, the Greencover Program and the Water Extension Program. Implementation of a significant number of stewardship beneficial management practices such as wetland restoration and other riparian practices can provide significant value to waterfowl and other bird species in Ontario, as well as protect existing wetlands and adjacent upland habitat.

3. Establishment of Priority Areas

Conservation planning within Ontario is led by OEHJV partner agencies using leading-edge scientific techniques that identify the most important areas of the province to protect and restore. They identify and document a portfolio of priority areas which, if conserved, will secure both waterfowl breeding and staging habitat, and the long-term survival of viable native species and community types of the region.

3.1 Landscape Planning Units

For planning purpose, Ontario is divided into different planning units (although in some cases, it is most appropriate to work at the provincial scale). The OEHJV originally divided the province into four Key Program Areas (KPAs), based on large-scale physiographic features (see Figure 1). Generally, conditions within each KPA provide suitable planning units for wetland and waterfowl conservation based on similar habitats, threats and waterfowl species assemblages.

More recently, continental bird conservation initiatives (NABCI and NAWMP) established Bird Conservation Regions (BCRs) and Waterfowl Conservation Regions (WCRs) throughout North America. BCRs are ecologically distinct regions in North America, with similar bird communities, habitats, and resource management issues for all bird groups. BCRs were modified to reflect the diversity of waterfowl throughout the continent, resulting in WCRs. There are four BCRs and five WCRs that occur in Ontario (shown with KPAs in Figure 1).

BCR 7 (Taiga Shield and Hudson Plains) and WCR 7.1 encompass the same area, corresponding approximately to the Hudson Bay Lowland (HBLD) KPA. The habitat consists of coastal marshes and extensive mud flats on the coast with mixed-wood forests interspersed with peat-covered lowlands in the inland portions.

BCR 8 (Boreal Softwood Shield) is further subdivided into two WCRs, 8.0 to the east and 8.1 to the west. This area encompasses the Northeastern Clay Belt (CLAY) KPA and the northwest portion of the Boreal Forest (BFOR) KPA. The habitat consists of a mosaic of forested uplands interspersed with small lakes, wetlands and peat bogs.

BCR 12 (Boreal Hardwood Transition) and WCR 12 encompass the same geographic area, and include the northern portion of the Great Lakes St Lawrence (GLSL) KPA and the southeastern portion of the BFOR KPA. The habitat in BCR/WCR 12 consists of coniferous and hardwood forests, inland lakes, rivers and bogs.

BCR 13 (Lower Great Lakes/St Lawrence Plain) and WCR 13 encompass the same geographic area. They constitute the southernmost portion of the GLSL KPA, consisting of the low-lying areas south of the Precambrian shield.

Within this IP, broad level conservation planning takes place at both the BCR and KPA levels in order to be consistent with previous efforts and reporting schemes. Some waterfowl planning (e.g. priority species) will use WCR units in order to be consistent with continental efforts. For all other bird groups, descriptions and planning units will be discussed at the BCR level. More detailed conservation planning by OEHJV partners occurs within BCR 13 where priority areas are identified for conservation program delivery.

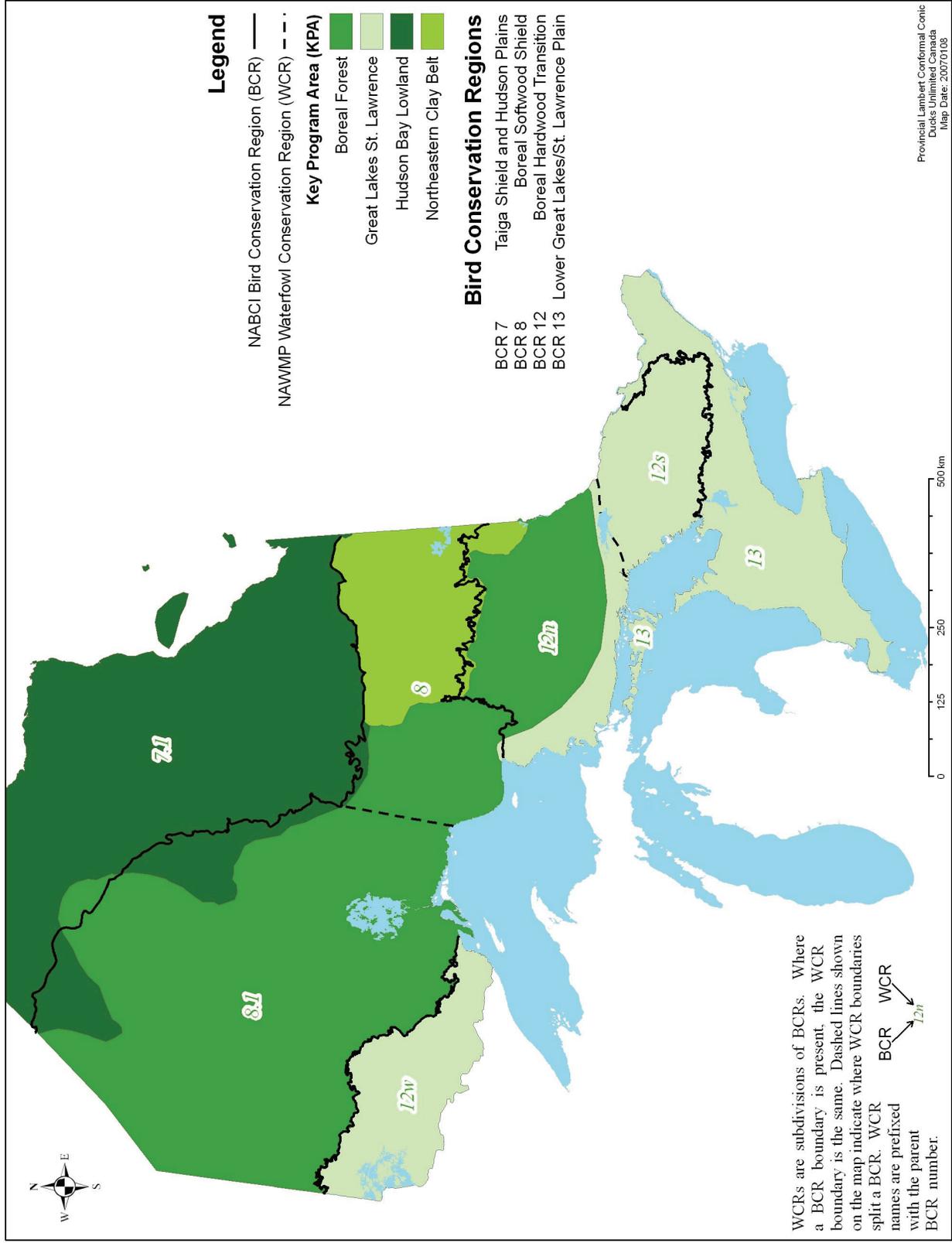


Figure 1: OEHJV Landscape Planning Units

3.2 BCR-Level Habitat and Waterfowl Assessment

The broad-scale identification of important breeding and staging habitat is enhanced by finer-scale assessments of the landscapes and waterfowl⁶ within each BCR. This finer level of detail allows for identifying priority landscapes and also for planning conservation programs and specific actions. See Appendix 3 for detailed descriptions of wetlands, uplands and waterfowl for each Ontario BCR.

3.3 Threat Assessment

In addition to an assessment of the relative importance of waterfowl breeding and staging habitat, it is important to gauge the level of threat to the habitat within each BCR when determining priority areas for conservation and conservation actions. Threats can impact waterfowl directly or they can impact the upland or wetland habitat base on which waterfowl depend. Threats can result in the loss of wetland habitat altogether, or the impairment of its function and value. Human population density and projected growth, the concentration of roads and other infrastructure, the amount of private/public land and the extent of land conversion to agricultural, urban, or other land uses are all stressors.

Briefly, the identified threats are:

For the **Taiga Shield and Hudson Plains**, growing interest in the extraction of mineral and other natural resources is of significant concern. Both the impact of climate change and the development of wind energy projects along the coast pose potential significant threats to waterfowl, other avian species and the habitat base.

For the **Boreal Forest (includes both the Boreal Softwood Shield and Boreal Hardwood Transition)**, potential threats to waterfowl and their habitat vary quite a bit between the largely undeveloped north (BCR 8) and the somewhat developed south (BCR12). Overall the threats are largely associated with resource extraction – mainly forestry, mining of minerals and peat, and hydro-electric developments. Climate change and acid precipitation are also of concern across the boreal, while the impact of fire suppression, off-road vehicles and other human disturbance threats occur to the south.

In the **Clay Belt portion of the Boreal Softwood Shield**, the potential to enhance agricultural productivity in light of climate change predictions could result in additional pressure on the habitat base from the clearing and draining of additional land. As with the boreal region, hydro-electric development also poses a risk to waterfowl habitat.

The **Lower Great Lakes/St. Lawrence Plain** has experienced more significant impacts on habitat than any other area. Wetland loss rates are highest in parts of southwestern Ontario largely due to historic agricultural activities and urbanization, which continue to be of concern. Additional threats include wetland degradation from landscape changes such as loss of buffers, contaminants, climate change, introduction of exotic species and Great Lakes water level management. Disturbance of primarily staging waterfowl is a growing issue with the development of wind energy projects proposed for offshore locations and the increase in recreational boating. Public perceptions regarding waterfowl and their habitat also are at issue because of diseases such as avian influenza and West Nile virus.

Appendix 4 contains a comprehensive assessment of threats/stressors to wetlands, waterfowl and other birds and bird habitats. The table also identifies recommended actions to counteract the threat/stressor based on OEJV key program activities (see Appendix 5) and identifies which actions planned through 2006-2010 (see section 5.1) will be used to mitigate priority threats. Threats/stressors in bold are those that will receive priority focus over the next five years.

⁶ For a summary of waterfowl data by BCR, see Table 2.

3.4 Provincial-Level Waterfowl Staging Habitat Assessment

Ontario contains continentally important **staging habitat**. Most of this habitat is associated with the shoreline of the lower Great Lakes and the coasts of Hudson and James Bay. Waterfowl use of key staging habitat is thoroughly documented by long-term aerial surveys. In addition, there are numerous inland staging habitats considered to be of major importance. Waterfowl staging use, especially in the lower Great Lakes, has increased since the mid-1980s in response to a combination of factors that may include increases in ice-free period and the introduction of zebra mussels (*Dreissena polymorpha*).

Four different measures were utilized to assess the relative value of staging habitats for the 1986 to 2003 period: total waterfowl use-days (WUDs), dabbling duck use-days, diver duck use-days and total waterfowl use-days per habitat acre. Differing slightly from the 1994 EHJV Implementation Plan methodology, this approach incorporates diving duck staging values into the assessment and organizes the staging areas into three categories instead of the previous four.

Dabbling duck use-days focused on shallow marsh habitats, which were sorted into three equal groups and ranked into categories as high (greater than 275,000 use-days), medium (between 125,000 and 275,000 use-days), or low (under 125,000 use-days). Similarly, diving duck use-days, focusing on open water staging habitats, were sorted into three equal groups and ranked into categories as high (greater than 1.25M use-days), medium (between 500,000 and 1.25M use-days), or low (under 500,000 use-days). For both waterfowl guilds, total annual waterfowl use-days were similarly sorted and ranked as either high (more than 2M WUDs), medium (between 750,000 and 2M WUDs), or low (under 750,000 WUDs). The final measure was a quantitative estimate of habitat quality derived from staging waterfowl densities: high (greater than 600 WUDs/acre), medium (between 225 and 600 WUDs/acre), and low (under 225 WUDs/acre).

In order to determine the relative overall importance of these staging habitats for waterfowl, each of the four staging value measures were given equal weight and total scores were summed. The summed scores were again sorted into three equal groups and ranked into three categories: low, medium and high. While comprehensive data are available for staging use of coastal areas, similar information on inland areas is not. Those habitats with incomplete data were assigned values based on a consensus of collective knowledge of the areas from members of the OEHJV Technical Committee. Ranked staging areas are illustrated in Figure 2.

3.5 OEHJV Priority Areas for NAWMP Implementation (2006-2010)

The identification of priority areas for conservation program delivery was undertaken separately by OEHJV partners in two complementary efforts aimed at meeting specific agency requirements: one led by NCC and OMNR, and a second led by DUC. The NCC and OMNR initiative developed Conservation Blueprints for Biodiversity highlighting critical terrestrial and aquatic habitats (only priority wetland areas identified through the Blueprints are illustrated in Figure 3). DUC's conservation planning work within BCR 13 resulted in the identification of Priority Habitat Areas. These two exercises augment the provincial-level waterfowl staging habitat assessment that was completed under the direction of the OEHJV partnership. Although different in their methodologies, both partner exercises include ecological valuations and threat indices and thus identify high value habitats that are in need of conservation. Many of the priority areas are directed to landscapes that currently provide valuable **breeding habitat** for waterfowl, based on average IBP density (Appendix 6) and wetland abundance and area.

Based on provincial-level staging habitat and OEHJV partner assessments, the BCR-level habitat and waterfowl assessments and the comprehensive threat assessment, a set of priority areas was chosen on which to focus conservation efforts for the period of this IP. Priority areas for staging habitat are indicated by their associated ranking – High, Medium and Low – in Figure 2. Those not associated with waterfowl staging habitats are illustrated in Figure 3. **The combination of the areas shown in Figures 2 and 3 represents the priority areas for conservation program delivery within the 2006-2010 IP.**

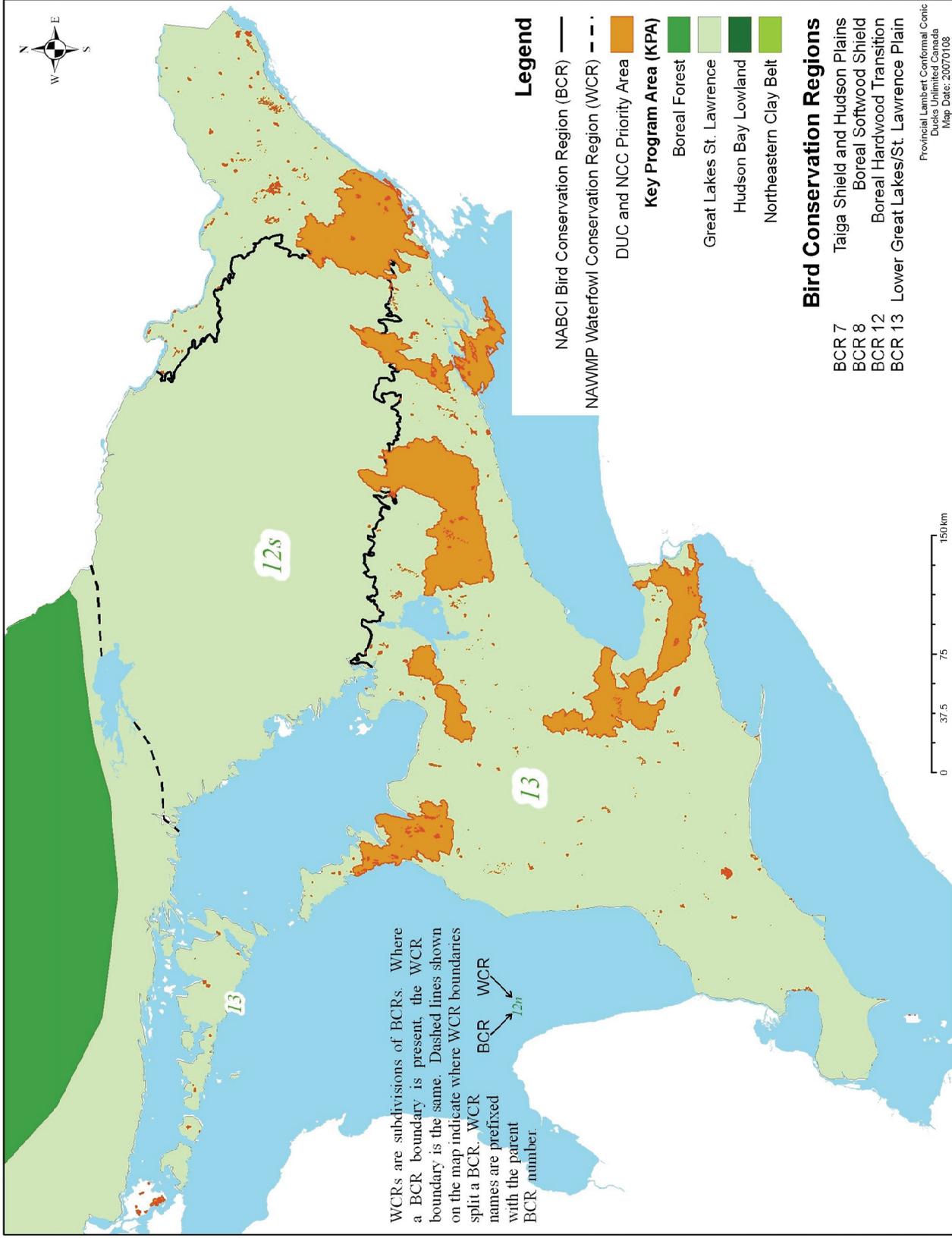


Figure 3: OEJV Five-Year Priority Areas for Securement and Enhancement Activities

4. Plan Objectives

The OEHJV was originally developed to implement the NAWMP in Ontario. The NAWMP described waterfowl population objectives and identified the need for habitat conservation as the primary action to help reach the population goals. The most direct means of conserving habitat is through securement, enhancement and management, but NAWMP also recognized the need for actions that could affect landscapes more broadly, such as policy change and affecting landowner behaviour. The OEHJV has developed quantitative, measurable objectives for waterfowl populations, and has linked these to corresponding objectives for habitat conservation through securement, enhancement, management and stewardship. Objectives for other key program activities – evaluation, communication and education and policy adjustment – have also been developed, although these are more qualitative in nature.

As the OEHJV has broadened its scope to include bird species groups other than waterfowl, objectives for these groups have been or are being developed in provincial or BCR level conservation plans. In most cases, science and planning relating to these bird groups and their habitats is less well advanced than for waterfowl, so objectives generally relate more to improving the state of scientific understanding and initiating preliminary planning activities.

4.1 Waterfowl Objectives

The waterfowl objectives for the OEHJV were developed in a manner consistent with the other Joint Ventures in the EHJV using CWS and other applicable survey data. Differences in the data sets, even with a consistent methodology, did add variation into the waterfowl objectives across the EHJV. Objectives were set for both breeding waterfowl in terms of Indicated Breeding Pairs (IBPs) and for staging/wintering waterfowl in terms of waterfowl use-day values.

The waterfowl objective for staging and wintering waterfowl used the status quo as an appropriate goal. For breeding waterfowl, the population objective was set in relation to a species-specific population benchmark. This benchmark and objective was established in a consistent manner across all Joint Ventures in the EHJV and is described in more detail in the overall EHJV Implementation Plan (2006-2010). The breeding waterfowl objective was then compared to the population trend and the ability of habitat conservation actions to achieve these goals to ensure they were realistic.

Provincial and BCR level objectives

Waterfowl species commonly found in Ontario are comprised of both breeding and non-breeding species, and their dependence on the habitats provided in Ontario varies widely. Those species for which a significant proportion of their continental population is dependent upon Ontario's resources are deemed to be "key waterfowl species". Table 1 illustrates benchmarks and objectives for key waterfowl species at the provincial scale and Table 2 provides more detailed information at the BCR scale. Values for ducks and temperate-breeding Canada geese have been determined by combining results of the CWS Eastern Waterfowl Survey in central and northeastern Ontario, and the CWS Southern Ontario Breeding Waterfowl Survey⁷. Those for Mississippi Valley and Southern James Bay Canada goose populations have been determined through annual breeding ground surveys and management plans.

⁷ For more information on these and other waterfowl surveys conducted in Ontario see Appendix 7.

Table 1: Population, Staging and Wintering Benchmarks and Objectives for Key Waterfowl Species in Ontario

Species	Continental Priority	EHJV Priority			Distribution (Priority Regions)						Population Trend	Population Baseline (IBPs)	Population Objective (IBPs)	Staging(s) or Wintering(w) Baseline*	Staging or Wintering Objective	Program Objective		
		Overall	Ontario		BCR		WCR		Breeding	Non-Breeding							Breeding	Non-Breeding
			Breeding	Non-Breeding	Breeding	Non-Breeding	Breeding	Non-Breeding										
Wood Duck	Moderate		High			13,12			13, 12			Stable	71,000	72,000		Eval, Cons		
Green-winged Teal	Moderate	High	High		13,12,7			13, 12, 7.1				Stable	16,000	16,000		Eval		
American Black Duck	High	High	High	High	13,12,8	13	13	13, 12, 8	13	13	13	Decreasing	53,400	55,000	TBD (w)	Eval, Cons		
Mallard	High	High	High	High	13,12,8,7			13, 12, 8.1, 8, 7.1				Stable	165,000	173,500		Cons		
Blue-winged Teal	Moderate high	High	High	High	13			13, 12				Decreasing	5700	6000		Eval, Cons		
Redhead	Moderate high		High	High		13			13		13	Stable			5.04M	Eval		
Canvasback	Moderate high		High	High		13					13	Stable			7.75M	Eval		
Lesser Scaup	High	High	High	High		13		7.1			13	Decreasing			32.51M** (s)	Eval		
Ring-necked Duck	Moderate	High	High	High	13,12,8,7	13	13	13, 12, 8.1, 8, 7.1			13	Stable	47,000	47,000	2.78M (s)	Eval		
Long-tailed Duck	Moderate high	High									13	Unknown			TBD (w)	Eval		
Common Goldeneye	Moderate high	High	High	High	12,8,7	13	13	12, 8.1, 8, 7.1			13	Stable	28,000	28,000	1.84M (s)	Eval		
Hooded Merganser	Moderate low	High	High		12			12				Stable	44,500	44,500		Eval		
Common Merganser	Moderate low	High	High	High	13,12,8,7	13	13	13, 12, 8.1, 8, 7.1			13	Stable	28,000	28,000	3.74M (s)	Eval		
Black Scoter	Moderate high	High	High	High	7	7	7	7.1			7.1	Unknown			TBD (s)	Eval		
Canada Geese - SUBP	High	High	High	High	7	13	13	7.1			13, 12	Stable	100,000	100,000		Eval		
Canada Geese - MVP	Moderate	High	High	High	7			7.1				Stable	375,000	375,000		Eval		
Canada Geese - Resident	Above objective	High	High	High	13,12			13, 12				Increasing	91,000	48,000***		Eval, Cons		
Tundra Swan	Moderate low	High	High	High		13					13	Increasing			2.48M (s)	Eval		

Eval = Evaluation Activities (i.e., Assessment, Directed Studies, Monitoring); Cons = Conservation Program Activities (i.e., Habitat Securement, Enhancement, Management, Stewardship)

*Based on waterfowl use-day totals (in millions) for the spring (March 1 – June 1) and fall (August 16 – January 1) migration periods for the southern Great Lakes shore in Ontario as determined during the 1999-2003 survey series

**Number reflects the waterfowl use-day value for both scaup species (greater and lesser scaup), as the two species cannot routinely be distinguished during aerial surveys.

*** Note, this objective to reduce Resident Canada Goose populations will be achieved through implementation of Actions 2.6 and 4.8 (see Table 5) and may also require active population management techniques outside the purview of the OEJV.

Table 2: Population Benchmarks and Objectives* by BCR for Key Waterfowl Species of High Breeding Priority in Ontario

Species	BCR 7	BCR 8	BCR 12	BCR 13
Ducks				
Wood duck	-	3,000	48,000	20,000 (21,000)*
Green-winged teal	-	4,000	7,000	5,000
American black duck	-	21,000	32,000 (33,600)*	400
Mallard	-	20,000	60,000	85,000 (93,500)*
Blue-winged teal	-	600	1,000	4,100 (4,400)*
Ring-necked duck	-	15,000	30,000	2,000
Common goldeneye	-	16,000	12,000	0
Hooded merganser	-	10,000	34,000	500
Geese and swans				
Canada Geese - Resident	-	-	-	91,000 (48,000)**
Canada Geese - SJBP	100,000	-	-	-
Canada Geese - MVP	375,000	-	-	-

* Objectives are in brackets where they differ from the benchmark.

** These values for temperate-breeding Canada Geese are combined for BCRs 12 and 13.

Linking Population Objectives, Limiting Factors and Conservation Actions for Waterfowl⁸

The **American black duck** (*Anas rubripes*) is an important species within the province and in eastern Canada, and it has experienced significant population declines since the 1960s. This population response is evident within all WCRs that provide breeding habitat: WCR 13, 12 and 8. The current baseline population estimate for the annually surveyed portion of the province is 53,400 IBPs. Despite a research focus on black ducks, uncertainty remains with respect to the exact cause of this population decline. Current science points to several possibilities including over-harvesting on the wintering grounds, a possible decrease in hen breeding condition due to changes in habitat, and interspecific competition for quality wetland habitat with mallards. Although additional research is required to meet existing information needs and gaps, the protection of the existing habitat base is crucial as a first step in maintaining existing populations. The OEHJV population goal for the black duck over the next five years is a 5% increase in IBPs, focusing particularly on WCR 12 and 13. The protection of the existing habitat base in WCR 12, along with the potential to have a positive influence on beaver pond habitat resulting from changes to forest management guidelines, will both be important steps towards achievement of the population objective. The provision of additional restored or enhanced habitat in WCR 13, not only during the breeding season and also outside of the breeding season, will be important to build body condition and thus reproductive fitness.

The **mallard** (*Anas platyrhynchos*) is the most successful waterfowl species in Ontario in terms of abundance and its breeding distribution across every WCR in the province. The population trend for this species is on the rise from a current estimate of 160,000 IBPs in Ontario, which is important throughout the flyway. Recent research has identified duckling survival, nest success and the availability of pairing habitat as limiting factors during the breeding season. The OEHJV population goal for the mallard over the next five years is an overall 5 % increase in Ontario IBPs, with the increase resulting from a 10% increase within WCR 13. The securement, restoration and enhancement of pairing habitat, especially in close proximity to quality brood habitat, will improve mallard reproductive success.

⁸ For a summary of this information, see Appendix 8.

The **blue-winged teal** (*Anas discors*) has experienced population declines not only in Ontario, but throughout the Great Lakes Basin. Current baseline population estimates place the blue-winged teal population at 5,700 IBPs in Ontario. Breeding habitat quality and availability for blue-winged teal has changed as agriculture has gradually shifted away from less intensive agriculture. Abundant productive seasonal wetlands that historically were associated with pasture land have declined and so have blue-winged teal populations. The OEHJV has established a population goal of 6,000 IBPs, which represents a 5% increase for this species. Conservation programs in WCR 13 that result in increases in wetland pairing habitat for species like the mallard will likely benefit blue-winged teal. These programs in conjunction with additional research to identify other causes of population decline are required.

The **green-winged teal** (*Anas crecca*) has a scattered and widespread distribution throughout Ontario in WCR 13, 12, 8.1 and 7.1 during the breeding season, with no significant concentration of breeding pairs. Current waterfowl surveys estimate 16,000 IBPs across the surveyed portion of the province representing a stable breeding population. Conservation practices that secure wetland and adjacent upland habitat will be important for maintaining this population objective.

Wood duck (*Aix sponsa*) populations in Ontario have continued to increase in recent years, reaching an apparent stable population estimate of 71,000 IBPs. The wood duck is a common breeding species in WCR 12 and 13 where forest management practices that influence both beaver populations and cavity nesting sites play a key role in reproductive success. Conservation practices that affect the productivity, abundance and distribution of wetlands in these forested landscapes will be paramount in reaching the OEHJV population objective of 72,000 IBPs which is an increase of approximately 1.5%. Continued support for nest box programs and other conservation programs that secure and restore forested wetlands will be important for the wood duck.

The **northern pintail** (*Anas acuta*) is a species not commonly encountered across most of Ontario and no estimate of the population size is available from current surveys. Survey data does indicate that breeding densities are low, with the exception of areas adjacent to the James and Hudson Bay coasts associated with WCR 7.1. Staging pintails pass through the GLSL and are abundant around eastern Ontario along Lake Ontario and the St. Lawrence River. Although this species has declined in numbers continentally primarily as a result of habitat loss in the Prairies, there is little evidence of this occurring in Ontario although preliminary analysis of recent Ontario Breeding Bird Atlas data suggests a possible decline in south-central Ontario. Further surveys and research will be required to better quantify population size, to fill in the existing science gaps and to design appropriate conservation programs.

Lesser scaup (*Aythya affinis*) have experienced significant continental population declines despite periods of seemingly ideal habitat conditions on the prairies. An uncommon breeding species in Ontario, the highest densities of breeding lesser scaup are recorded on the HBLD coast in WCR 7.1. An accurate breeding population estimate is not available in Ontario with current survey data (see notes for greater scaup below). Without an accurate breeding population estimate for the province, the OEHJV goal for lesser scaup is to reverse the declining trend in IBP observations. Despite this population decline, an increase in both the proportion of the continental population and absolute lesser scaup numbers has been recorded staging on the Great Lakes. This response is thought to be a result of the ice-free conditions on the lower Great Lakes that increase both the duration and area of suitable wintering habitat. Issues such as the potential reduction in reproductive fitness due to the intake of contaminants (e.g. bio-accumulation of selenium found in the flesh of zebra mussels) while birds stage and over-winter on the Great Lakes require further investigation. Other factors that may reduce lesser scaup body condition may be related to anthropogenic disturbance that limits feeding in optimal foraging locations. The protection of breeding habitats within the HBLD in WCR 7.1 will be important to the conservation of Ontario's breeding population.

Greater scaup (*Aythya marila*) have been a challenge to differentiate from lesser scaup during aerial surveys so the two species are often lumped together under a general heading of “scaup”. Breeding greater scaup are sparsely distributed primarily in subarctic tundra at the very northern extremes of the province (WCR 7.1), making an annual estimation of breeding population size impossible. No quantifiable goal is possible with existing survey information. The affinity of the two scaup species within both their breeding grounds and staging habitats affirm the need to frequently combine the two together when considering conservation efforts. Many of the same research needs, science gaps, and conservation efforts that apply to lesser scaup are also applicable to greater scaup.

The **canvasback** (*Aythya valisineria*) is a very rare breeding species in Ontario, with occasional nesting occurrences along the Great Lake shoreline associated with the coastal wetlands of Lakes Ontario and St. Clair. However, Ontario plays a continentally significant role in the provision of staging habitat for the canvasback as it passes through both the Mississippi and Atlantic flyways. As an example of this significance, 29% of the continent’s canvasback population was observed on Lake St. Clair during the 2006 Annual Mid-Winter Survey. Canvasback are also over-wintering on the Great Lakes in increasing abundance as increasing ice-free periods provide optimal habitat. The maintenance of the quality and quantity of staging habitat for this species will require conservation programs to focus on the Great Lakes and their associated anthropogenic issues.

Similar to the canvasback, the **redhead** (*Aythya americana*) is an uncommon breeding species in Ontario with rare nesting occurrences within Great Lake coastal wetlands. Primarily a migrant, the staging habitats of the Great Lakes prove continentally significant for this species during both spring and fall migrations along the Mississippi and Atlantic flyways. As with the canvasback, but to a lesser extent, redheads do over-winter within the Great Lakes as conditions allow. The maintenance of the quality and quantity of the staging habitat for this species, like that for the canvasback, will require conservation programs to focus on the Great Lakes and related anthropogenic issues.

The **ring-necked duck** (*Aythya collaris*) is an important species breeding in the Boreal Forest WCRs 12, 8 and 8.1. The breeding population has been stable over the long term and most recently has shown an increasing trend. The provincial breeding population baseline is estimated at 47,000 IBPs. The goal of the OEHJV is to maintain the existing population and continue to monitor the present population growth. The ring-necked duck is not well studied and the reasons for population increases are unknown. As such, the protection of the existing wetland habitat base should be a priority while research programs are initiated to fill information gaps and science needs.

The **long-tailed duck** (*Clangula hyemalis*) breeds along the Hudson and James Bay coasts in WCR 7.1 and appears in growing numbers in the staging and wintering habitats of the lower Great Lakes. Survey data, although not extensive for this species, seem to support a stable population estimate throughout its breeding range. There is insufficient information to develop a baseline population estimate for the province and thus no population goal has been established. Additional survey data would address this information gap. Oil spills are of concern, particularly where the birds occur in large concentrations. Winter surveys would be helpful in determining distribution and population trends in the Great Lakes, and expanded breeding bird surveys in eastern Canada would help document breeding bird numbers, according to the Sea Duck Joint Venture. In addition, as with lesser scaup, issues such as potential reduction in reproductive fitness due to the intake of contaminants and anthropogenic disturbance while birds stage and over-winter on the Great Lakes require further investigation. The continued securement of coastal staging and breeding habitat is critical to maintaining the long-tailed duck’s population.

The **common goldeneye** (*Bucephala clangula*) is a hardy species that will over-winter in Ontario with the provision of adequate open water and food resources typically found on the Great Lakes in mid-winter. Breeding habitat for goldeneye pairs is prevalent in BCRs 12 and 8. The breeding population estimate is 28,000 IBPs, and the maintenance of this stable population is the OEHJV goal for this species.

Conservation programs that deal with forest management planning and affect the enhancement of wetland habitat and cavity nesting sites in the forested landscape will benefit this species. Additional research is needed to determine the value of nest box programs targeted at increasing goldeneye hen success in landscapes where natural nesting cavities are deemed limiting.

The **hooded merganser** (*Lophodytes cucullatus*) is a common breeding species in WCR 12 and the forested portions of WCR 13. Current breeding population estimates are on the rise, and place the growing population size at 44,500 IBPs. The OEHJV population goal for the species is to maintain its current status. Like the wood duck and goldeneye, conservation programs that deal with forest management planning and lead to the enhancement of wetland habitat abundance and cavity nesting sites in the forested landscape will benefit this species. Support for nest box programs delivered in areas where natural cavity nesting sites are limiting will also benefit this species.

The **common merganser** (*Mergus merganser*) is among the most common breeding species of waterfowl in WCRs 12, 8.1 and 7.1. The common merganser prefers to nest in cavities and thus is dependent on cavity availability, making forest management practices important for the species. Staging habitat provided along the Great Lakes, including the upper Great Lakes, is significant for the common merganser, which has a broad distribution within all the flyways. The maintenance of staging habitat within the Great Lakes is the OEHJV objective for this and other species dependent upon this critical staging habitat. In addition, conservation practices that promote the securement of the species' existing breeding habitat overlap with those of other cavity nesting species such as the wood duck.

Black scoter (*Melanitta nigra americana*) population estimates are poorly understood as neither the breeding range nor the wintering range is consistently censused. Existing surveys of moulting areas in James and Hudson Bays suggest that the portion of the population that breeds along the HBLD coastal zone in BCR 7.1 is stable. Survival estimates are absent and data are needed on basic population dynamics and ecology for this species.

There are three populations of **Canada geese** (*Branta canadensis*) that breed in Ontario. The temperate breeding (resident) population is rising exponentially in size in WCRs 13 and 12. An overabundance of temperate-breeding Canada geese is currently not limited by factors such as hunting, which has been used as a control mechanism in some areas of the province. Additional measures will be required to curb population growth. The two northern breeding populations are the Mississippi Valley population, which breeds in WCR 7.1 and 8 and migrates through WCR 8 and 13, and the Southern James Bay population, which breeds in WCR 7 and migrates through WCR 12 and 13. For these breeding habitat may not be a limiting factor because of the remoteness of their breeding ground; however brood rearing habitat may be in certain locations. The effects of weather on both nest success and gosling survival within each population are annual impacts that aren't manageable. Continual monitoring of the traditional spring harvest by aboriginal communities is required to determine if there is any potential impact on these two breeding populations. For the northern populations, additional research evaluating the impacts of staging habitat quality on breeding bird body condition is also important to determine if conservation efforts are required to increase their reproductive fitness. The protection of the HBLD will be of paramount importance to these two populations.

The **Atlantic brant** (*Branta bernicla*) is not a breeding species in Ontario. This arctic nesting species migrates through Ontario in both spring and fall on its way to and from the breeding grounds. Sub-adults remain in small numbers and moult along the HBLD coastline of James and Hudson Bays. This same area provides critical foraging habitat for paired breeding adults in the spring where they replace food reserves used in migration and build female body condition. Recent research has assisted with the establishment of breeding population estimates. The maintenance of the current stable population of Atlantic brant is the goal for the OEHJV. An improved understanding of the staging habitat utilized by this species may assist with the development of appropriate conservation programs.

The eastern population of the **tundra swan** (*Cygnus columbianus*) breeds in WCR 7.1 and migrates through the lower Great Lakes in both the spring and fall. Surveys have recorded increases in abundance but no breeding population estimate is currently available; this is an information gap for this species. Spring pre-migration body condition has a significant effect on reproductive fitness as the birds need to accumulate fat resources in the south prior to reaching the breeding grounds. Waste grain made available in agricultural portions of the province is an important contributor to these endogenous reserves, so enhancing agricultural practices that provide residual waste grain in the spring would be a beneficial initiative. Programs that increase ephemeral sheet water in staging areas would also be desirable.

The **mute swan** (*Cygnus olor*) is an exotic species introduced into North America. Populations throughout the continent are increasing, which is causing concern about habitat destruction and interspecific competition. Discussions among various government agencies about the overabundance of this species and potential actions to decrease the population have been initiated.

The **trumpeter swan** (*Cygnus buccinator*) is not considered to be a native species in Ontario and therefore not included in this IP. Currently an introduction program is underway with a current estimate of 131 breeding pairs located in the province.

OEHJV's Conservation Program

The OEHJV employs four main activities to achieve its waterfowl population and habitat objectives. Collectively, these four programs are termed "conservation programs" and include:

- **Habitat Securement**
- **Habitat Enhancement**
- **Habitat Management**
- **Stewardship**

Appendix 5 provides more information about these programs as well as the other activities carried out by the OEHJV.

4.2 Habitat Objectives

The OEHJV waterfowl population objectives will be achieved through a combination of conservation programs aimed at maintaining the existing habitat base throughout the province and strategically augmenting this available habitat with additional or enhanced habitat. Based on the conservation planning work that was utilized to identify the priority areas shown in Figures 2 and 3, it is expected that most of the habitat conservation activities – securement, enhancement, management and stewardship – will occur in the Lower Great Lakes/St. Lawrence Plain BCR. By understanding the relationship between waterfowl and their habitat, predictions can be made regarding the amount and type of habitat required to achieve the population goals. Through strategic planning, realistically tempered by the availability of program funding, OEHJV partners have planned conservation program objectives for **wetland and wetland-associated upland habitats** for the next five years. These objectives are set out in Table 3.

Table 3: Five-Year Habitat Program Objectives: Lower Great Lakes/St. Lawrence Plain and southerly Boreal Hardwood Transition (BCR 12 & 13)

Program Activity	Wetland Acres	Wetland-Associated Upland Acres	Total Acres
1. Habitat Securement			
a) Acquisition			
Fee-simple purchase	850	950	1,800
Land donation	125	125	250
Total Acquisition	975	1,075	2,050
b) Other than acquisition			
Conservation agreement	2,000	6,000	8,000
Conservation easement	250	250	500
Crown designation	0	0	0
Cooperative land use agreement	0	0	0
Total Other Than Acquisition	2,250	6,250	8,500
Total Securement	3,225	7,325	10,550
2. Habitat Enhancement	2,550	7,260	9,810
3. Habitat Management⁹	191,000	287,500	478,500
4. Stewardship	500,000	-----	500,000

Predicting the resultant waterfowl outcomes from the habitat program outlined in Table 3 is of value in both assessing anticipated program benefits and analyzing the progress towards waterfowl population objectives. The predicted waterfowl outcomes were based on some key assumptions emerging from scientific knowledge gained from monitoring and evaluation of OEJV programs and wetland habitats. These monitoring programs included the CWS Southern Ontario Breeding Waterfowl Survey, the Mallard Ecology Study, the Webster Waterfowl Study and the Ontario Waterfowl Production Study. The detailed methodology used to predict the waterfowl outcome is described in Appendix 9. The predicted waterfowl outcomes are shown below in Table 4.

Table 4: Predicted Waterfowl Outcomes

Program Activity	Wetland Acres (Hectares) over 5 years	Predicted Waterfowl Response (IBP/hectare)	Total Predicted Waterfowl (IBP)
Habitat Securement	3,225 (1,305)	0.3	392 (Maintenance of Existing Pairs)
Habitat Enhancement	2,550 (1,032)	3.6	3,715 (New Pairs)
Habitat Management	191,000 (77,298)	3.6	278,273 (Maintenance of Existing Pairs)
Stewardship (Extension / Influence)	5,700/494,300 (2,307/200,040)	3.6/0.3	8,305 / 60,012 (New Pairs / Maintenance of Existing)
Total	N/A	N/A	350,697

⁹ Note there are expected contributions to be made in the Habitat Management category as a result of incentive programs for the adoption of Beneficial Management Practices (BMPs) in the Agricultural Sector, but it is not possible to forecast contributions in advance since it is not known what proportion of the BMPs will be applicable to Joint Venture activities.

4.3 Integrating Objectives from Other Bird Plans under NABCI

NABCI aims to ensure that populations and habitats of North America's birds are protected, restored and enhanced through coordinated efforts at international, national, regional and local levels, guided by sound science and effective management. In Ontario, priority-setting and planning within BCRs for shorebirds, landbirds and waterbirds will provide a biologically-based framework for the integration of all bird conservation initiatives. Important habitats and conservation actions identified through this process will be addressed by existing and new partners where funding is available. Habitat conservation for all birds will require an important increase in overall funding. Short-term efforts will be made to identify the benefits to other birds of protecting important waterfowl habitats in the province.

In addition to the habitat objectives noted in section 4.2, **upland habitat that is not associated with wetlands** is conserved by EHJV partners through *The Landbird Habitat Conservation Pilot Project*. This project is a collaborative stewardship pilot project inspired by NABCI, the Ontario Partners in Flight (PIF) planning initiatives and the emerging “All Birds, All Habitats” plans of EHJV partners. The pilot is being delivered in and around selected areas of significant bird habitat in BCR 13 (Lower Great Lakes/St. Lawrence Plain), particularly within Carolinian Canada. Target habitats include uplands, and specifically grasslands and forest habitats. Target regions include private lands closely associated with Important Bird Areas, provincially significant wetlands, critical habitats for species at risk, NWAs, provincial parks, nature reserves and protected areas owned by the NCC, Ontario Nature, land trusts and other conservation agencies. Conservation objectives are established on an annual basis in accordance with the Ontario Landbird Conservation Plan for BCR 13; however, quantitative (acre-based) habitat objectives are not available at this time. The pilot project will serve to inform implementation of a longer-term, cooperative ‘all-bird’ habitat conservation program under the EHJV for southern Ontario.

For reference, appendix 10 provides a summary of the landbird and shorebird conservation objectives outlined in the Ontario Landbird Conservation Plan for BCR 13 and in the Ontario Shorebird Conservation Plan. Several actions are planned for the next five years to help achieve NABCI objectives within Ontario (see “NABCI Planning/Monitoring/Implementation actions” in Table 5). In addition, many OEHV habitat conservation, evaluation, communication and policy adjustment objectives and programs will also serve to contribute towards achieving objectives for these other bird groups.

4.4 Other Program Objectives

In addition to direct programs that deliver on-the-ground conservation of habitat for the benefit of waterfowl populations, other programs, including those under evaluation, communication and education and policy adjustment, contribute to the overall goals of the OEHV. It is difficult to quantify objectives for these other programs, but they are integral to the success of the OEHV.

These programs are critical for:

- Establishing information on the status of habitat in Ontario;
- Supporting local and regional conservation planning, which in part facilitates the development of conservation programs and the prioritization of locations for delivery;
- Helping to evaluate the efficacy of programs and projects to determine their effects on waterfowl and other bird populations;
- Determining the effects of non-habitat variables and threats on waterfowl and other bird populations and determining how these can be accounted for within the context of program delivery;

- Informing stakeholders, policy makers, landowners and others of the purpose and function of the OEHJV program, which leads to support of the program and of conservation values; and
- Creating support from policy makers for the delivery of wetland conservation through the OEHJV programs as well as through conservation policies.

Evaluation

OEHJV success depends on effective planning, implementation and evaluation of conservation actions on waterfowl populations and habitat.

The **main objective of the evaluation program** is to determine whether OEHJV programs are contributing to the conservation of waterfowl populations and their habitats. More specifically, evaluation programs will help validate the biological assumptions used to develop conservation programs and test the efficacy of specific conservation activities at various spatial scales. Evaluation programs will therefore be designed to answer the following questions:

- Is the Joint Venture (JV) meeting stated objectives?
- Is the JV employing the best techniques and implementing the most effective programs?
- Are changes needed in the JV's approach?

The results of this ongoing evaluation process will feed into the management and implementation of programs such that they will be integrated into subsequent actions. This adaptive management approach will be used in the development and refinement of conservation programs.

Communication and Education

An effective communication and education program is essential to the success of this JV. It will generate public awareness, involvement and acceptance of this plan as a major initiative to protect and enhance wetland habitats, and thus improve waterfowl populations and associated biodiversity.

The **objectives of the communication and education program** are to inform, update and educate the residents of Ontario about the need for wetland conservation and the efforts underway to conserve wetlands, and to motivate and assist groups, governments, politicians and especially individuals to support, promote, and reinforce the strong linkage between a healthy economy and a healthy environment. Communication programs will rely mainly on the existing efforts of OEHJV partners.

A further objective of the OEHJV will be to inform and educate the Ontario public, conservation practitioners and decision makers regarding the conservation of all birds and their habitats.

Policy Adjustment

The conservation of large areas of wetland and associated habitats can be made possible through changes to regulations and policies; therefore, the **objective of the policy adjustment program** is to continue to influence those policies that have an effect on birds and their habitats.

5. Implementation Actions

5.1 Implementation Actions for 2006-2010

This IP identifies a series of actions that, taken together, will enable the OEHJV to reach its identified objectives. Appendix 5 sets out definitions, descriptions and examples of the broader activities on which these conservation actions are based. Table 5 describes OEHJV actions for 2006-2010, divided into the five categories described below.

[1] Conservation Program Actions: Securement, enhancement, management and stewardship

These actions relate specifically to conserving habitat, and can be directly associated with acreage objectives. Accordingly, OEHJV partners will engage in these activities to meet the acreage objectives identified in Section 4.2. Securement activities and targets are planned in some detail in Table 3, with specific levels of purchase, donation, agreement and easement options identified. Enhancement and management actions are more difficult to predict; as lands are secured, specific, appropriate enhancement and management prescriptions will be developed for the lands.

[2] Communication and education actions

These actions will be undertaken to increase knowledge and support of the OEHJV and its conservation activities.

[3] Evaluation

These actions will be undertaken at four scales: A) provincial, B) BCR, C) conservation program, and D) small-scale directed studies. Many of these evaluation activities stem from existing programs that are currently being delivered by OEHJV partners. Actions listed, though not inclusive, represent priority evaluation actions for the next five years. (Implementation of additional actions within this time period may be considered by the Ontario EHJV Steering Committee).

NOTE: “Existing” actions that will continue to be supported by the OEHJV are **denoted with an “*E”** in Table 5.

Other “proposed” evaluation actions (not currently being delivered), **denoted as “*P”**, may require additional financial and/or in-kind support from OEHJV partners to facilitate implementation.

[4] Policy adjustment actions

Policy-related actions are many and varied. OEHJV partners will continue to work with policy-makers to ensure the protection of natural habitat by influencing municipal, provincial and federal policy.

[5] NABCI planning, monitoring and implementation actions

These actions are focused primarily on planning, monitoring and research, with implementation occurring only on a small scale. In the future, NABCI actions may be incorporated into the other categories of actions noted above. Actions are focussed on three of the four bird pillars (waterbirds, shorebirds, landbirds).

Table 5: Actions for 2006-2010

No.	EHJV Activity	Action	Benefits to OEJV	Proposed /Existing	Funding Needed (1000s)	Timeline	Agency*
1	Habitat Securement	Secure priority waterfowl staging/breeding and wetland habitat (figs 2 & 3) using standard OEJV securement activities	Protect and maintain the quality and quantity of 10,550 acres of habitat in Ontario. This includes the securement of 3,225 acres of wetland habitat that will result in the maintenance of a predicted 392 waterfowl IBPs.	E	8,500	Implemented Annually	NCC, DUC, OMNR, CWS
2	Habitat Enhancement	Enhance waterfowl and wetland habitat in priority areas (incl. implementation of the nest box program for cavity-nesting species)	Enhancement of 9,810 acres of secured area to increase benefit to wildlife and humans. This includes the enhancement of 2,550 acres of wetland habitat that will result in an increase of a predicted 3,715 waterfowl IBPs.	E	5,175	Implemented Annually	DUC, NCC, OMNR, CWS, WHC
3	Habitat Management	Manage existing OEJV secured/enhanced habitat	Maintain and manage existing secured/enhanced sites (478,500 acres) to ensure continued ecological, social and economic benefits. This includes the management of 191,000 acres of wetland habitat that will result in the maintenance of a predicted 278,273 waterfowl IBPs	E	4,055	Implemented Annually	DUC, NCC, OMNR, CWS
4	Stewardship	Implement stewardship activities (extension and influence) in priority areas on the landscape	Conduct extension activities on 5,700 acres and positively influence 494,300 acres of habitat through program implementation. This will result in an increase of a predicted 8,305 new pairs as well as the maintenance of approximately 60,012 existing waterfowl IBPs.	E	7,000	Implemented Annually	OMNR, DUC, CWS, NCC

No.	EHJV Activity	Action	Benefits to OEJV	Proposed /Existing	Funding Needed ('000s)	Timeline	Agency*
2	Communication /Education	Promote wetland conservation within school-curricula	Promotion of OEJV activities and accomplishments. Recognition of OEJV partnership. Improve transparency and encourage new partnerships. Promotion of BMPs and wetland and bird conservation. Dissemination of important scientific information that can be used to better manage, conserve, enhance or influence decisions and activities.	E/P	785	Implemented Annually	CWS, DUC, OMNR
		Produce Progress Reports on a regular basis		E/P		Report in 2007 and in 2010	OMNR, CWS, DUC
		Maintain information on the OEJV webpage		E		Implemented Annually	CWS
		Publish scientific manuscripts		E/P		As needed	CWS
		Produce partner publication materials that reach broad audiences (e.g., fact sheets, technical reports)		E/P		As needed	All
6		Prepare and distribute communications materials to landowners regarding techniques to mitigate conflicts with Canada Geese	Will increase awareness of Canada Geese population issues, aid in mitigation of nuisance goose issues, and may aid in reducing population numbers if mitigation techniques are widely implemented.	E		As needed	CWS
3	Evaluation – Provincial Level	Track partner contributions, expenditures and accomplishments in the National Tracking System database	Facilitates tracking, reporting and evaluation of OEJV accomplishments	E	**	Implemented Annually	All
		Track all OEJV partner habitat accomplishments through the National Tracking System at the BCR level	Facilitates tracking, reporting and evaluation of OEJV accomplishments	E	**	Implemented Annually	All

No.	EHJV Activity	Action	Benefits to OEJV	Proposed /Existing	Funding Needed ('000s)	Timeline	Agency*
3		Conduct waterfowl surveys (as described in Appendix 7) to accurately assess population status	<p>Allows for: accurate assessment of population numbers, trend analysis, priority setting, conservation planning, and evaluation.</p> <p>This survey work will serve to inform and test conclusions from the directed study (action 3.17) on black duck population trends.</p> <p>Will allow for identification of wetland and associated uplands, facilitating monitoring and evaluation.</p> <p>The GLCWI is a bi-national inventory providing a standard reference for the Great Lakes wetland community</p> <p>Allow for identification and measurement of wetland and associated uplands, facilitating monitoring and evaluation or program activities (e.g., action 3.13 is contingent upon completion of SOLRIS).</p> <p>Development of a new rapid, cost-effective, and scientifically sound wetland evaluation system (used to identify wetlands receiving legislative protection in Ontario) may result in additional wetlands protected.</p> <p>This project will produce new estimates of wetland loss/gain across southern Ontario, which can be compared to previous and future numbers to produce information on trends and facilitate priority setting, accomplishment measurement/assessment and policy influence.</p>	E	3,415	Implemented Annually	CWS, OMNR
4		Conduct wintering surveys further offshore from shorelines in BCR 13 and 12		E		Implemented Annually	CWS, OMNR
5		Conduct waterfowl banding programs		E		Implemented Annually	OMNR, CWS
6		Complete Great Lakes surveys of waterfowl staging areas		P		2010	CWS
7		Re-conduct previous waterfowl surveys in the staging areas of James Bay to generate new survey data		P		2010	CWS, OMNR
8		Conduct the Waterfowl Pair and Brood Surveys of the Northeastern Clay Belt, focusing on black ducks		P		2010	OMNR, CWS
9		Support completion of the Canadian Wetland Inventory for BCR 7, 8, 12 and 13		E		On-going	CWS, (OMNR)
10		Support the Great Lakes Coastal Wetland Inventory Project (GLCWIP)		E		On-going	CWS, OMNR
11		Undertake programs that measure habitat at appropriate intervals and scales (e.g., Southern Ontario Land Resource Information System and the Canadian Wetland Inventory)		E		SOLRIS slated for completion in 2008	OMNR, CWS
12		Develop remote sensing methods to identify and evaluate wetlands		E		2010	OMNR
13		Complete development of the Wetland Conservation Analysis (a project that builds on Environment Canada's wetlands loss work with E. Snell)		P		Completed in/by 2008	DUC, OMNR, CWS

No.	EHJV Activity	Action	Benefits to OEJV	Proposed /Existing	Funding Needed (1000s)	Timeline	Agency*
14	Evaluation – Program Level Assessment	Monitor uptake of Best Management Practices (BMPs) through the Farm and Environmental Management Survey.	Determine the effectiveness of extension programs and of the federal Greencover program	E	100		DUC, OMAFRA,
15		Develop a habitat-based waterfowl productivity model	Assist in the evaluation of conservation program effectiveness	P		DUC, CWS	
16		Develop an assessment method to determine the current condition of wetland protection in Ontario, including the effectiveness of the Provincial Policy Statement	Evaluation of policy effectiveness in protecting wetlands; results may be useful in future policy influence activities. (Linked to action 4.3)	P		DUC, OMNR	
17	Evaluation – Directed Studies	Analyze black duck population trends in the western portion of their breeding range	Explore potential declines and improve understanding of factors that drive vital rates. Supports objectives of the BDJV.	E	500		CWS, OMNR, BDJV
18		Investigate blue-winged teal population declines by first confirming the decline and secondly by examining the linkage between historic/current habitat availability and population numbers.	Results will aid in developing appropriate management, enhancement or conservation programs to increase and/or maintain blue-winged teal IBPs in the province. Note: this action will utilize a variety of population data (e.g., CWS Southern Ontario Breeding Waterfowl Survey, banding data, and wing returns) and habitat data (e.g., 1967 Canada Land Inventory, 1982 and 1990 OMAF Land Cover, SOLRIS).	P		CWS, DUC	
19	Evaluation – Directed Studies	Investigate effects on wetland distribution, abundance and function due to climate change	Determine degree of impacts to birds and wetlands. Information can be used to aid with development of mitigation strategies, to influence policy decisions or to educate the public.	P			CWS, OMNR
20		Investigate the impact of current forestry practices on waterfowl and populations	Determine degree of impact, cause of impact, and mitigation of impacts. Information can be used to encourage forestry companies and officials to implement BMPs or conservation programs to improve, maintain or enhance the habitat available for waterfowl in Ontario.	P		OMNR, DUC, CWS, BSC	
21		Modelling of black duck habitat associations	Supports objectives of the BDJV	P		OMNR, CWS, BDJV	

No.	EHJV Activity	Action	Benefits to OEJV	Proposed /Existing	Funding Needed ('1000s)	Timeline	Agency*
4		1	Review official plans, zoning by-laws, and other regulations	E	550	Annually	DUC, OMNR
		2	Create or enhance tax incentive policies/programs	P/E		As opportunities arise	DUC, NCC, OMNR
		3	Promote and strengthen wetland protection by providing input via periodic reviews of the Provincial Policy Statement (PPS)	P/E		As opportunities arise	OMNR, DUC, NCC
		4	Support legislation permitting conservation organizations to enter into legally-binding conservation easements	E		As opportunities arise	All
		5	Promote and implement tax relief programs for capital gains on donated lands, as well as other tax relief/incentive programs	E		As opportunities arise	CWS, DUC, NCC, OMNR
		6	Promote policies that enhance habitat conservation in industrial sectors (e.g., agriculture, forestry, mining, windpower, and aggregate extraction)	E		As opportunities arise	All
		7	Promote the valuation of natural heritage capital through the development of an Ecological Goods and Services (EGS) framework	P		As opportunities arise	DUC, All
		8	Review and adjust accordingly provincial hunting regulations as new population data becomes available and continue to provide opportunities and permits for the harvest and/or control of Canada Geese. Investigate additional population control measures	E		As opportunities arise	CWS
5	1	Conduct Marsh Monitoring Program surveys to evaluate waterbird populations and other wetland dependent species using OEJV sites	P	100		BSC, All	

No.	EHJV Activity	Action	Benefits to OEJV	Proposed /Existing	Funding Needed (1000s)	Timeline	Agency*
5		Conduct waterbird nesting colony surveys and annual nest count surveys	Allows for: accurate assessment of population numbers, trend analysis, priority setting, conservation planning, and evaluation. Recommendations, priorities and objectives provided for the conservation of Ontario's waterbird species. Will aid directing efforts towards the protection, management and stewardship of wetlands and important colonial staging areas.	E	30		CWS, OMNR
	2	Prepare a BCR-based conservation plan for Ontario waterbirds		P	100	Completion in 2008	OMNR, CWS
	3	Continue to undertake activities associated with the Provincial Cormorant Program	Activities include: monitoring, banding, research and management of cormorant populations	E	800	Implemented Annually	OMNR, CWS
	4	Continue to support the volunteer-based Ontario shorebird surveys	Allows for: accurate assessment of population numbers, trend analysis, priority setting, conservation planning, and evaluation.	E	10	Implemented Annually	CWS
	5	Develop shorebird monitoring techniques for the Hudson Bay area		P	TBD		CWS
	6	Conduct/support shorebird habitat management activities	Enhancement and management of shorebird habitat through the following projects: Hillman Seasonal Cell, BSC shorebird habitat management, and shorebird conservation components in the Presqu'île Beach management plan.	E	TBD		DUC, CWS, BSC
	7	Satellite telemetry of marbled godwits (James Bay population) to determine foraging and habitat selection on breeding grounds, migration routes and wintering locations	Will result in better understanding of the habitat use and life history of these birds. Will aid in decision-making regarding protection and management of these species and their habitats.	P	10	2008	OMNR
	8	Study habitat selection and use by semi-palmated plovers in James Bay in relation to snow goose habitat degradation	Action 5.8 will support the action plan for marbled godwits.	E	50	On-going study since 2002	OMNR
	9	Complete and publish Ontario Landbird Conservation Plans (OLCP) for BCRs 8,12. Publish OLCP for BCR 13.	Recommendations, priorities and objectives provided for the conservation of Ontario landbird species, consistent with NABCI goals and objectives.	E	200	Completion in 2008	OMNR, CWS, BSC
	10	Prepare an Ontario Landbird Conservation Plan for BCR 7	Recommendations, priorities and objectives provided for the conservation Ontario's landbird species in BCR 7, consistent with NABCI goals and objectives.	P		Completion in/by 2010	OMNR, CWS
	11						

* Agency refers to either a contributing agency and/or delivery agency ** Costs are included in the cost of OEJV program coordination (\$ 3.76M)

5.2 Linkages to Complementary Initiatives in Ontario

OEHJV partners, other government agencies and non-government organizations (NGOs) are involved in many conservation initiatives, including those that are outside of the OEHJV but are complementary and help the OEHJV to meet its conservation goals and objectives. These initiatives may result in direct benefits, through supporting habitat conservation, for example, or may help indirectly, by providing strategic and evaluative information to the OEHJV and its programs. In some cases OEHJV partners participate directly in these initiatives; in other cases, they may promote the programs to landowners or others, and in still other cases, may simply benefit from the outcomes.

(Note that many of the OEHJV programs and actions noted in Table 5 also contribute to the success of these complimentary initiatives, but discussion of these linkages is currently beyond the scope of this IP. However, in the future it may prove beneficial to the OEHJV to identify and document such linkages in order to build additional support for the OEHJV and its programs.)

Some initiatives bring attention and support to **conservation in general**. For example, the *Canadian Biodiversity Strategy* and *Ontario's Biodiversity Strategy*, which are directed towards engaging private citizens in biodiversity conservation, conserving habitat, promoting the sustainable use of biological resources, promoting stewardship through work with private landowners, facilitating collaboration and partnership, integrating biodiversity conservation into land use planning, protecting biodiversity through habitat securement, and improving our understanding of resources and ecological relationships. While actions under these strategies clearly benefit OEHJV programs, at this time, there is no mechanism in place to draw direct correlations.

A number of federal and provincial government initiatives, supported by other partners, indirectly provide support for a number of OEHJV objectives: securement, policy adjustment, stewardship and monitoring/evaluation. Many of these relate to the Great Lakes and are therefore of significant interest to the OEHJV and its focus on the protection and restoration of coastal wetland habitats. Initiatives include:

- *Canada-Ontario Agreement respecting the Great Lakes Basin Ecosystem (COA)*
The goals of this agreement are to strive for a healthy, prosperous and sustainable Great Lakes Basin ecosystem for present and future generations, and to restore, protect and conserve the ecosystem in the Great Lakes Basin.
- *Remedial Actions Plans for the Great Lakes Areas of Concern*
These plans identify specific problems in severely degraded Great Lakes Areas of Concern and describe methods for correcting them.
- *Great Lakes Wetlands Conservation Action Plan (GLWCAP)*
The objective of this plan is to coordinate and focus wetland conservation activities, including wetland securement, rehabilitation and public outreach, in the Great Lakes Basin.
- *State of the Lakes Ecosystem Conference (SOLEC)*
The objective of this conference is to address issues pertaining to the Great Lakes via bi-national collaboration of agencies involved, and to provide strategic direction on federal Great Lakes policy, priorities and programs.

A number of initiatives help to support OEHJV **waterfowl objectives**. Survey and monitoring programs that provide information on avian populations and/or habitat conditions are of significant importance to OEHJV. This type of information is a critical component of the adaptive management process which facilitates the evaluation and improvement of conservation programs, and therefore also helps to meet **evaluation objectives**. Outside of the monitoring that is supported and implemented through the OEHJV and its partners, complementary monitoring programs undertaken by other agencies include:

- *Forest Bird Monitoring Program*
The objective of this program is to compile a habitat-specific baseline inventory of breeding forest birds and to gather an understanding of population trends for forest birds in Ontario.
- *The Great Lakes Marsh Monitoring Program*
This program monitors the status of marshbirds, amphibians and their habitats.
- *Ontario Breeding Bird Atlas*
The Ontario Breeding Bird Atlas contains data on the breeding distribution of all bird species that breed in Ontario.
- *Breeding Bird Survey*
The objective of the Breeding Bird Survey is to determine long-term population trends in North America's breeding birds. Data may indicate bird species that are in decline and require conservation action, or reveal long-term changes in land-use, environmental contaminants or climate change.

Several complementary programs also support **habitat securement objectives**.

- *Ecological Gifts Program*
The federal Ecological Gifts Program supports securement by providing an income tax incentive that encourages landowners to donate ecologically sensitive land to conservation agencies. Eligible donations include fee simple title, partial interests, including conservation easements.
- *Provincial (Ontario Parks) and Federal (Parks Canada) Protected Areas*
The provincial and federal parks programs work to acquire and designate land as protected areas
- *Habitat Stewardship Program for Species at Risk*
This federal program, linked to the *Species at Risk Act*, fosters partnerships among organizations and provides funding to "stewards" for implementing activities that protect or conserve habitats for species designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as nationally "at risk" (endangered, threatened or of special concern).

OEHJV **stewardship objectives** are supported through a range of initiatives that provide encouragement, expertise and resources to influence land use changes that result in improved conservation values on the land. Some of these initiatives include:

- *Canada's Stewardship Agenda*
The objective is to support and encourage stewardship as a key conservation tool by establishing a national network of stewards, improving coordination among stewardship programs and efforts, and supporting the capacity of individual stewards to carry out conservation activities.
- *Stewardship Network of Ontario*
This initiative involves people from various groups working together in southern Ontario to advocate and implement resource stewardship on private lands in Ontario. Under the program, individuals make a personal commitment to care for the land and to sustain it for future generations through volunteerism and community empowerment.
- *Agriculture Policy Framework (APF) – Environmental Farm Plans and Best Management Practices*
Under this federal program, farmers prepare a plan that rates how their land use activities affect the environment, including the air, soil, wildlife and water sources. Recommendations are made for the implementation of Beneficial Management Practices (BMPs) that will decrease the risks to natural resources. The APF program includes a wetland restoration BMP for agricultural producers interested in enhancing wetland habitat. Several other BMPs are focused on nutrient and pest management, land and water management and biodiversity management and are captured by the cost-share programs found under the *Agricultural Policy Framework*. In addition

to the wetland restoration BMP, examples of BMPs that provide benefits to wetlands and associated uplands include riparian area management, erosion control, grazing management, safe application of pesticides and shelterbelt establishment.

- *Canada-Ontario Farm Stewardship Program*
A voluntary cost-share program to encourage producers to improve management of agricultural land through the adoption of Beneficial Management Practices to reduce risk to water and air quality, improve soil productivity and enhance wildlife habitat.
- *Canada-Ontario Greencover Program*
A cost-share funding program to help producers improve land management practices, promote sustainable land use, protect water quality, reduce greenhouse gas emissions, enhance biodiversity and wildlife habitat, and expand the land base covered with perennial forest and trees.
- *Managed Forest Tax Incentive Program (MFTIP)*
This program encourages landowner participation in natural resource stewardship on private forest land in Ontario, which may include forested wetlands.
- *Conservation Land Tax Incentive Program (CLTIP)*
The objective of this program is to conserve Ontario's significant lands, including wetlands, by providing a tax incentive that encourages the landowners to leave the land in its natural state.
- *Natural Spaces Program*
This is a voluntary partnership program to help reduce the loss of greenspace in southern Ontario by encouraging landowners to restore and protect natural areas on their properties.
- *Wetland Drain Restoration Project (WDRP)*
The WDRP, initiated as a solution to improve the reliability of a clean and abundant water supply, uses the *Drainage Act* to restore wetlands without impairing agricultural business objectives.
- *Ontario Wetland Evaluation Program*
A program used to identify provincially significant wetlands, using evaluation procedures established by the Province. Wetlands identified using the Ontario Wetland Evaluation System as being provincially significant, once incorporated into municipal Official Plans and the like, are afforded protection from development and site alteration under the *Planning Act*.

There are fewer outside initiatives that support OEHJV **communication and education objectives**. Education of both landowners and the general public about the importance of wetlands to the environment and society is of paramount importance. Without the support of the public, government policy changes that enhance wetland protection are challenging to advance. Without the support of landowners, implementation of conservation programs on private lands is impossible. The OEHJV is involved in many activities that support this notion of the importance of education and communication. In addition, individual partners have their own communications strategies. Outside of the OEHJV and its partners' programs, few initiatives exist. One exception is *WetKit* (www.wetkit.net), a web-based tool designed to streamline access to practical tools to help Canadians better understand and manage wetlands. The website, which showcases many wetland-related tools, is aimed at Canadians who influence what happens on the ground, including farmers, foresters, woodlot owners, municipal planners, environmental assessment practitioners, community leaders, property owners, developers, and many others.

WetKit is also a tool for reporting on implementation of *The Ramsar Convention on Wetlands* in Canada. Ramsar seeks to ensure the sustainable, wise use of wetland resources and its objectives include the designation of wetland sites of international importance, implementing wetland policies and awareness programs, fostering cooperation with other conservation organizations, legislative review and managing a network of protected wetland sites of international importance.

Evaluation programs and adaptive management are often dependent upon monitoring information and habitat inventories completed at various temporal and spatial scales. OEHJV **evaluation objectives** are supported by the following inventories, initiatives and programs:

- *Important Bird Areas (IBAs)*
This program identifies locations providing essential habitat for one or more species of breeding or non-breeding birds, and implements partnered stewardship programs for essential bird habitats.
- *Lower Great Lakes Coastal Wetland Monitoring Program*
The objective of this program is to develop standardized monitoring protocols for the long-term assessment of coastal wetland habitat and biotic communities. Monitoring information is currently available for a growing geographical area.
- *Great Lakes Coastal Wetlands Consortium (GLCWC)*
The purpose of the GLCWC is to design and implement a long-term program to monitor and assess the health of Great Lakes coastal wetlands.
- *Canadian Wetland Inventory (CWI)*
This program provides an overarching, hierarchal framework for wetland inventory in Canada, and describes and measures wetland extent in Canada.
- *Southern Ontario Land Resource Information System (SOLRIS)*
SOLRIS uses remote sensing to make digital maps of the landscape, accurately mapping land cover such as forests, wetlands and urban areas, and allowing for the tracking of changes in land cover and land use over time.
- *Great Lakes Conservation Blueprints for Biodiversity*
An initiative to assemble, map and analyze data on the different ecosystems and special biodiversity features across the Canadian side of the Great Lakes Basin. The Blueprint identifies distinct ecological systems or areas of distinct landforms, soils, water, plants and animals. The Blueprint is intended as a tool to aid agencies and conservationists to focus their environmental efforts and make conservation planning decisions.
- *Great Lakes Islands Biodiversity Project*
A project to develop an island classification system and conduct a biodiversity assessment for islands or island groups in the Ontario portion of the Great Lakes.
- *State of the Resources Reporting (SORR)*
The purpose of SORR is to inform the public about the health and management of Ontario's natural resources, while promoting citizen engagement. Reports will cover a variety of topics including: forests, fish, wildlife, protected areas, lands and waters. Resource reports will generally include an assessment of the state or condition of the resource, the factors influencing the resource and the current management actions being undertaken.
- *Wildlife Assessment Program*
The Ontario Wildlife Assessment Program monitors "representative" wildlife species that may be affected by forest activities.

6. Projected Resource Needs and Partner Contributions

6.1 Required Resources

The following table provides a summary of the total habitat acres and projected costs as related to objectives for all planned activities across all BCRs¹⁰ by all partners in the next five years, excluding other bird plan objectives and NABCI actions.

Table 6: Five-Year Forecasted Financial Resources Required to Achieve OEHJV Waterfowl and Habitat Objectives

Strategy/Activity	Total Acres	Projected Cost	Delivery Agency
1. Habitat Securement			
a) Acquisition			
Fee-simple purchase	1,800	\$2,600,000	NCC, DUC
Land donation	250	\$200,000	NCC, DUC
TOTAL ACQUISITION	2,050	\$2,800,000	NCC, DUC
b) Other than acquisition			
Conservation agreement	8,000	\$5,200,000	NCC, DUC
Conservation easement	500	\$400,000	NCC, DUC
Crown designation	0	\$0	NCC, DUC
Cooperative land use agreement	0	\$0	NCC, DUC
TOTAL OTHER THAN ACQUISITION	8,500	\$5,600,000	NCC, DUC
Common Activities	0	\$100,000	NCC, DUC
Total Securement	10,550	\$8,500,000	NCC, DUC
2. Habitat Enhancement	9,810	\$5,175,000	DUC, NCC
3. Habitat Management	478,500	\$4,055,000	DUC, NCC
4. Stewardship			
a) Extension	5,700	\$1,000,000	DUC, OMNR
b) Influence	494,300	\$6,000,000	OMNR, DUC
Total Stewardship	500,000	\$7,000,000	OMNR, DUC
5. Communication and Education	N/A	\$785,000	ALL
6. Coordination	N/A	\$3,760,000	ALL
7. Evaluation			
a) Assessment		\$100,000	DUC, OMNR
b) Directed Studies		\$500,000	CWS, OMNR, DUC
c) Monitoring		\$3,415,000	CWS, OMNR, DUC
Total Evaluation	N/A	\$4,015,000	
8. Policy Adjustment	N/A	\$550,000	ALL
9. Recon and Design	N/A	\$50,000	DUC, NCC
TOTAL	*	\$33,890,000	

* Note that acres are not additive; enhanced and managed acres are acres that are previously secured.

¹⁰ Habitat activities – securement, enhancement, management and stewardship – take place primarily within BCRs 12 and 13; all other activities take place across all BCRs.

6.2 Planned Partner Contributions

The following table summarizes financial commitments partners expect to make to OEHJV waterfowl and habitat programs over the next five years. These figures are estimates only and are based on anticipated NAWCA funding levels.

Table 7: Five-Year Forecasted Partner Contributions to OEHJV-NAWMP 2006-2010

Program Delivery Agency	Contributing Agency					US Non-federal Match			Grand Total
	OMNR	CWS	NCC	WHC	USFWS	State	DUI /FNCC	OMAFRA	
OMNR	\$10,350,000								\$10,350,000
CWS		\$2,010,000							\$2,010,000
DUC	\$1,800,000	\$615,000		\$200,000	\$7,675,000	\$1,800,000	\$5,875,000		\$18,880,000
NCC		\$600,000	\$175,000		\$900,000		\$900,000		\$2,575,000
OMAFRA								\$75,000	\$75,000
TOTAL Contributions	\$12,150,000	\$3,225,000	\$175,000	\$200,000	\$8,575,000	\$1,800,000	\$6,775,000	\$75,000	\$33,890,000

7. Measuring, Reporting and Evaluating Progress

7.1 Direct and Indirect Outcomes

The actions taken under this IP will have direct, measurable outcomes, but they will also provide benefits that are less tangible, although no less important.

Direct, measurable outcomes: impact on habitats and populations

The delivery of wetland conservation programs will directly contribute to waterfowl breeding populations through the conservation of wetlands and wetland-associated uplands. The incorporation of NABCI into the guiding principles and objectives of the IP means that the well-developed OEHJV framework will also contribute to conservation planning and implementation for all the bird pillars in Ontario. Direct, measurable outcomes of this implementation plan are:

- Increased/maintained habitat for the conservation of all birds;
- Increased security of continentally important staging habitat, which benefits birds migrating to and from other continental breeding areas;
- Positive impacts on avian survival and recruitment, not only in Ontario, but across several continental regions;
- Enhanced ecosystem health and increased habitat conservation, which improves biodiversity values and provides benefits to a wide range of fish, wildlife and plant species, including species at risk;
- Through management, enhancement and awareness: improved containment of the spread of exotic species;
- Through monitoring and directed studies: the identification of priority species and habitats and the identification and adoption of implementation measures that will lead to maintenance or growth of populations of priority species, and the association between habitat features and avian populations;
- Through directed studies and adaptive management: increased knowledge and the implementation of techniques that are most effective on the landscape and that have the greatest beneficial impact on avian populations; and
- Enhanced interactions with species JVs (e.g. Black Duck Joint Venture, Sea Duck Joint Venture, and Arctic Goose Joint Venture) to collaborate in achieving population goals as well as identifying key linkages among habitat issues and population issues for the species JVs.

Indirect, societal benefits

Through the conservation of wetland and upland habitats, OEHJV partners are providing a broad range of socioeconomic benefits.

Wetlands are among the most productive and biologically diverse habitats on earth, and are an essential component of healthy natural watersheds. By conserving wetlands, we contribute to the protection of plant and animal species, and of surface water and groundwater resources.

Wetland ecosystems, and their associated uplands, perform a variety of important functions, including:

- *Water Quality Improvement:* Wetlands improve water quality through the trapping of sediments, the removal and/or retention of excess nutrients, the immobilization and/or degradation of contaminants and the removal of bacteria.
- *Groundwater Recharge and Discharge:* Wetlands ensure a stable, long-term water supply by recharging and discharging groundwater.

- *Flood Control:* Wetlands provide flood damage reduction through the control and storage of surface water.
- *Erosion Control:* Wetland vegetation stabilizes shoreline soils and reduces erosion damage by protecting shorelines against water runoff, waves and wind.
- *Recreation and Tourism:* Wetlands provide numerous recreational and eco-tourism opportunities (e.g. hunting, fishing, bird watching, hiking, boating/canoeing). Wetlands can also be valuable for education and research purposes.
- *Marketable Products:* Wetlands provide economic benefits such as renewable harvesting opportunities for timber, fuelwood, fish, wildlife, wild rice and medicinal herbs.
- *Wildlife Habitat and Biodiversity:* Wetlands provide critical habitat (food, space, shelter, movement corridors) for a wide variety of plant and animal species, including migrating waterfowl, waterbirds, shorebirds, some landbirds and numerous species at risk. Wetlands are biodiversity 'hotspots'. Humans depend on biodiversity to provide food, shelter, clean air, water, climate, etc.
- *Carbon Sequestration:* Wetlands that actively accumulate peat (e.g., bogs and fens) can act as long-term sinks for carbon dioxide in the atmosphere (i.e., carbon can be retained in the wetland instead of being released into the atmosphere as a greenhouse gas).

Woodlands also perform a number of important ecological functions. They affect both water quantity and water quality by reducing the intensity and volume of stormwater runoff and decreasing soil erosion and flooding. By removing nutrients, sediments and toxins from surface water runoff and sub-surface flows, woodland vegetation contributes to the maintenance of water quality in the province's lakes and streams. The shade provided by woodlands located adjacent to water bodies also helps keep water temperatures cool, helping to maintain high quality habitat for desirable sports fish species such as brook trout. Woodlands may also contribute to the protection of groundwater recharge areas.

Woodlands also have economic benefits. The harvest of wood products through sustainable forestry practices can support local forest industries and provide important income to woodlot owners. The sustainable harvest of these and other forest resources, such as maple syrup and fuelwood contribute significantly to the economies of many of southern Ontario's rural communities.

7.2 Reporting on Progress

Reporting progress towards waterfowl objectives

Maintaining existing population levels is the objective for most of Ontario's key waterfowl species with increases proposed for black ducks, mallards, blue-winged teal and wood ducks. Conversely the objective for resident Canada geese is a population reduction. OEHJV will report on the progress towards reaching waterfowl objectives over a 10-year timescale, by measuring waterfowl IBP response as a trend over time and linking that change to corresponding changes in waterfowl habitat.

The relatively short 10-year term for the waterfowl assessment component of the IP may prove challenging to show significant progress in terms of waterfowl, as will an even shorter five-year assessment term for reporting habitat change at the larger landscape level.

For IBP response, CWS and OMNR surveys will be the source of data (see Appendix 7). A focus on species trends rather than absolute numbers will minimize effects of variation due to precipitation, survey timing, migration chronologies, etc. Additional plots may need to be established to effectively measure waterfowl trends in more specific areas such as priority areas for conservation program delivery.

The reporting of progress towards waterfowl objectives can be augmented by an enhanced understanding of the relationship between conservation programs and the corresponding waterfowl response. The Mallard Ecology Study (MES) detailed waterfowl vital rates and the companion Habitat Evaluation Network (HEN) model could be used to assist in the waterfowl assessment through the development of a waterfowl productivity model. A waterfowl productivity model would provide a predictive tool, that could be used (especially in BCR 13), to better understand the anticipated benefits of conservation programs and drive adaptive management. Land cover data sets such as the Southern Ontario Land Resource Information System (SOLRIS) and the CWS Southern Ontario Breeding Waterfowl Survey will provide critical information to populate the model.

OEHJV partners are expected to track their individual conservation program successes by recording key attribute data such as project area, habitat type and Geographical Information System (GIS) digitized spatial information on an annual basis.

Reporting progress towards habitat and other objectives

Progress towards habitat objectives (securement, enhancement, management and stewardship), and communication and education, evaluation and policy adjustment objectives, will be measured annually in acres and dollars, as appropriate. Each agency will be responsible for reporting their direct and complementary program contributions, accomplishments and expenditures to the NTS through the regional database coordinator, and to the OEHJV Fiscal Committee. The Fiscal Committee will meet quarterly to report on progress and collaborate to prepare and review the annual progress report. Linkages will be made with the national NTS working group to ensure that reporting is consistent with other JVs.

Engagement with the research community will allow independent peer-review of programs and help the Technical Committee implement recommendations on adaptive management techniques. By tracking the outcomes of the research community the OEHJV will be able to determine the effects of biotic and abiotic parameters on habitat and waterfowl populations and account for them in modeling and tracking exercises. Accomplishments will be reported in an annual progress report.

For wetland habitat assessment, SOLRIS will assist in assessing landscape-level habitat changes over time. While SOLRIS is being completed, OEHJV partners have initiated a Wetland Conversion Analysis (a GIS project to measure wetland loss/gain across southern Ontario) that will assess historic wetland changes over time, and will relate back to previous wetland loss work. This information will be critical to understanding trends in wetland habitat abundance and the effectiveness of wetland conservation and securement programs.

In addition, through engagement and collaboration with the research community, the OEHJV will be able to encourage programs that determine the effects of other, non-habitat, factors on waterfowl populations. By developing a thorough understanding of the variables that affect waterfowl populations in Ontario the OEHJV will be able to accurately assess the impacts of habitat programs, while accounting for the effects of other factors. This will also help to gauge and account for the effects of other types of programs, such as the impact on avian populations of policy adjustment and education that serve to mitigate the effects of threats.

Progress towards the achievement of objectives of other NABCI Bird Plans (landbirds, waterbirds and shorebirds) will be completed by CWS in cooperation with implementing lead agencies.

In addition, the programs and initiatives of the OEHJV provide benefits beyond those intended for waterfowl and waterfowl habitat. Other species of wetland dependent wildlife including birds, amphibians, reptiles and mammals, are common beneficiaries. Increased biodiversity and clean water, for

example, also result. Often these broader benefits go unrealized, and thus the OEHJV program value is not fully appreciated. Future efforts could entail developing methods to capture and publicize these benefits.

7.3 Plan and Program Evaluation

Plan Evaluation

This IP will be evaluated at the end of five years by the OEHJV Technical Committee, and the results reported to the Ontario Steering Committee. The evaluation will incorporate the recommendations of the NAWMP assessment team that reviewed the 1994 OEHJV Implementation Plan at the end of its 15-year term. Components of the evaluation include:

- Waterfowl population trends and comparison to waterfowl objectives;
- Amount of waterfowl habitat secured and comparison to habitat objectives (link habitat to waterfowl populations);
- Assessment of net habitat change over time;
- Efforts in public policy, extension, marketing and communication;
- Review of conservation strategies based on best biological and geographic information available;
- Measurement of achievement for other bird pillars (NABCI); and
- Assessment of spatial and biological prioritization exercises.

The evaluation of the success of this IP will be facilitated by rolling up the evaluations of individual key programs activities supported by the OEHJV.

Program Evaluation

The evaluation of conservation programs is integral to successful implementation, program outcome analysis and determinations of future direction. Evaluation of program impact on both waterfowl and habitat objectives will be conducted on an annual basis by the OEHJV Technical Committee. This evaluation will be conducted at scales that include the program level, and, where warranted, at the individual project scale. In addition to the evaluation of program performance against the waterfowl and habitat objectives, consideration of social and economic factors also needs to be included. This evaluation will ensure that adaptive management is effectively utilized to guide the improvement of existing conservation programs and aid in the development of new initiatives.

At the BCR level (focusing primarily on BCR 13 where the majority of the program will be implemented), the relationship between land cover data and waterfowl survey data will be modelled. This work may include the development of a waterfowl productivity model using existing science and research (e.g. the Mallard Ecology Study) allowing for the impacts of changes in land cover to be assessed in terms of a breeding waterfowl response. Conservation program success at the BCR or smaller landscape level could then be predicted using the waterfowl productivity model.

OEHJV partners will continue to track achievements in GIS format so that programs can continue to be targeted through linkages to other features on the landscape. Key conservation program assumptions (including species-specific limiting factors) will be tested and integrated into an adaptive management process.

8. Bibliography

- Blokpoel, H., and G. D. Tessier. 1993. *Atlas of colonial waterbirds nesting on the Canadian Great Lakes, 1989-1991*. Part 1. Cormorants, gulls and island-nesting terns on Lake Superior in 1989. Canadian Wildlife Service Technical Report Series No. 181. 96 pp.
- Blokpoel, H., and Tessier, G.D. 1996. *Atlas of colonial waterbirds nesting on the Canadian Great Lakes, 1989-1991*. Part 3. Cormorants, gulls and island-nesting terns on the Lower Great Lakes system in 1990. Canadian Wildlife Service Technical Report Series No. 225. 74 pp.
- Blokpoel, H., and Tessier, G.D. 1997. *Atlas of colonial waterbirds nesting on the Canadian Great Lakes, 1989-1991*. Part 2. Cormorants, gulls and island-nesting terns on Lake Huron in 1989. Canadian Wildlife Service Technical Report Series No. 259. 154 pp.
- Comer, P., K. Goodin, G. Hammerson, S. Menard, M. Pyne, M. Reid, M. Robles, M. Russo, L. Sneddon, K. Snow, A. Tomaino, and M. Tuffly. 2005. *Biodiversity Values of Geographically Isolated Wetlands: An Analysis of 20 U.S. States*. NatureServe, Arlington, VA. 59 pp.
- Environment Canada, 2002. *Where Land Meets Water: Understanding Wetlands of the Great Lakes*. 72 pp.
- Environment Canada. 2004. *How Much Habitat is Enough? A Framework for Guiding Habitat Rehabilitation in Great Lakes Areas of Concern (Second Edition)*. 80pp.
- Environment Canada. 2006. *Great Lakes Wetlands Conservation Action Plan: 2003 to 2005 Highlights Report*. 24pp.
- Gabor, T.S., A.K. North, L.C.M. Ross, H.R. Murkin, J.S. Anderson, and M. Raven. 2004. *Natural Values, The Importance of Wetlands and Upland Conservation Practices in Watershed Management: Functions and Values for Water Quality and Quantity*. Ducks Unlimited Canada, 56pp.
- Government of Canada. 1995. *Canadian Biodiversity Strategy: Canada's Response to the Convention on Biological Diversity*. 80pp.
- Government of Ontario. 2005. *Protecting What Sustains Us: Ontario's Biodiversity Strategy*. 44pp.
- Maynard, L. and D. Wilcox. 1997. *Coastal Wetlands*. State of the Lakes Ecosystem Conference (SOLEC) 1996 Background Paper.
http://www.epa.gov/glnpo/solec/solec/1996/Coastal_Wetlands_of_the_Great_Lakes.pdf
- Meyer, J.L. et al. 2003. *Where Rivers are Born: The Scientific Imperative for Defending Small Streams and Wetlands*. 23pp.
- Nature Conservancy of Canada and Ontario Ministry of Natural Resources (Natural Heritage Information Centre). 2005. *Great Lakes Conservation Blueprint for Aquatic Biodiversity*, Volumes 1 and 2.
- Nature Conservancy of Canada and Ontario Ministry of Natural Resources (Natural Heritage Information Centre). 2005. *Great Lakes Conservation Blueprint for Terrestrial Biodiversity*, Volumes 1 and 2.

- Olewiler, N. 2004. *The Value of Natural Capital in Settled Areas of Canada*. Ducks Unlimited Canada and the Nature Conservancy of Canada. 36pp.
- Ontario Ministry of Natural Resources. 1993 (revised 2002). *Ontario Wetland Evaluation System: Southern Manual*
- Ontario Ministry of Natural Resources. 1993 (revised 2002). *Ontario Wetland Evaluation System: Northern Manual*
- Ontario Ministry of Natural Resources. 1999. Natural Heritage Reference Manual for Policy 2.3 of the Provincial Policy Statement. 128 pp.
- Ontario Ministry of Natural Resources. Norfolk Land Stewardship Council and Norfolk County. 2003. *Wetland Drain Restoration Project "HOW TO GUIDE": Enhancing Water Storage and Water Quality within a Watershed through Wetland Restoration*. 28 pp.
- Ontario Ministry of Natural Resources. 2005. *Protecting what sustains us: Ontario's Biodiversity Strategy*. 45 pp.
- Ontario Ministry of Natural Resources. 2005. *Our Sustainable Future. Ministry of Natural Resources Strategic Directions*.
- Ontario Ministry of Natural Resources. 2006. *Forest resources of Ontario 2006: State of the Forest Report 2006*. Forest Information Series. 159 pp.
- Pittaway, R. 1999. Southbound Shorebirds. OFO News 17(2):1-7.
- Snell, E.A., 1987. *Wetland distribution and conversion in southern Ontario*. Working paper no. 48. Environment Canada. 53pp.
- Taylor, A.K., P. Sprott, and F.J. Mazzotti. 2002. *The Vital Link between Land and Water: The Importance of Uplands for Protecting Wetland Functions*. Wildlife Ecology and Conservation Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date December, 1990. Revised September, 2002. Reviewed and renumbered May, 1999 as SS-WIS-45. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.
- Timmermans, S.T.A. and G.E. Craigie. 2002. *The Marsh Monitoring Program 2002 report: monitoring Great Lakes wetlands and their amphibian and bird inhabitants*. Unpublished report by Bird Studies Canada for Environment Canada and the U.S. Environmental Protection Agency. 44 pp.
- Twolan-Strutt, L. 1995. *Wetlands and Woodlots*. Sustaining Wetlands Issues Paper Series, ISSUES PAPER, No. 1995 – 1, North American Wetlands Conservation Council (Canada). 24 pp.

EHJV, NAWMP, & NABCI Strategic Documents and Plans

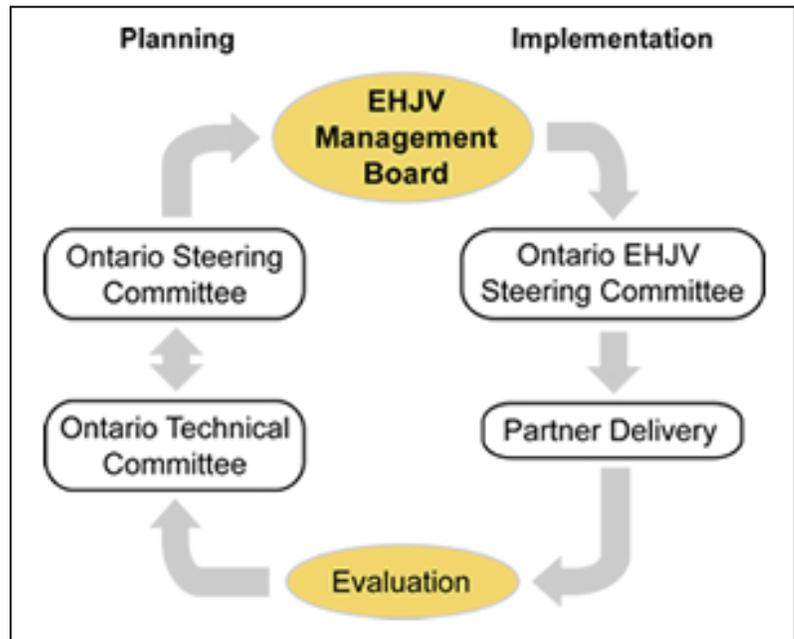
- Donaldson, G.M., C. Hyslop, R.I.G. Morrison, H.L. Dickson, and I. Davidson. 2000. *Canadian Shorebird Conservation Plan*. Environment Canada. 28pp.
- Eastern Habitat Joint Venture Partnership. 2004. *A Strategic Framework for the Delivery of the Eastern Habitat Joint Venture Partnership 2004 to 2009*. 8pp.
- Kushlan, J. A. et al. 2002. *Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan*, Version 1. Waterbird Conservation for the Americas, Washington DC, USA, 78pp.
- Milko, R., L. Dickson, R. Elliot, and G. Donaldson. 2003. *Wings Over Water: Canada's Waterbird Conservation Plan*. Environment Canada. 28 pp.
- North American Waterfowl Management Plan, Plan Committee. 2004. *North American Waterfowl Management Plan 2004. Implementation Framework: Strengthening the Biological Foundation*. Canadian Wildlife Service, U.S. Fish and Wildlife Service, Secretaria de Medio Ambiente y Recursos Naturales, 106pp.
- North American Waterfowl Management Plan, Plan Committee. 2004. *North American Waterfowl Management Plan 2004. Strategic Guidance: Strengthening the Biological Foundation*. Canadian Wildlife Service, U.S. Fish and Wildlife Service, Secretaria de Medio Ambiente y Recursos Naturales, 22pp.
- OEHJV Technical Committee. 1991. *Strategic Plan for Ontario*. 19pp.
- Ontario OEHJV Steering Committee. 1994. *Ontario Implementation Plan for the Eastern Habitat Joint Venture of the North American Waterfowl Management Plan*. 63pp.
- Ontario Partners in Flight. DRAFT (2007). *Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain (North American Bird Conservation Region 13) Priorities, Objectives and Recommended Actions*
- Ontario Partners in Flight. DRAFT (2007). *Ontario Landbird Conservation Plan: Boreal Softwood Shield (North American Bird Conservation Region 8). Priorities, Objectives and Recommended Actions*.
- Ontario Partners in Flight. DRAFT (2007). *Ontario Landbird Conservation Plan: Boreal Hardwood Transition (North American Bird Conservation Region 12), Priorities, Objectives and Recommended Actions*.
- Rich, T.D. et al. 2004. *Partners in Flight North American Landbird Conservation Plan*. Cornell Lab of Ornithology. Ithaca, NY. 84pp.
- Ross, K., K. Abraham, R. Clay, B. Collins, J. Iron, R. James, D. Mclachlin, and R. Weeber. 2003. *Ontario Shorebird Conservation Plan*. Environment Canada. 48 pp.
- Wires, L, et al. DRAFT (2005). *Upper Mississippi Valley/Great Lakes Waterbird Conservation Plan*.

Appendix 1: Ontario Eastern Habitat Joint Venture Governance

There are three committees that operate within the OEHJV: the Steering Committee, the Technical Committee and the Fiscal Committee. The Ontario Steering Committee provides overall direction to the Ontario partnership, establishes goals and objectives, and oversees the other committees that exist within the OEHJV. The Steering Committee also coordinates the development of OEHJV programs, governs the implementation of programs, liaises with the EHJV Management Board and evaluates program delivery.

The Technical Committee is responsible for providing guidance to the Steering Committee on scientific and technical matters. It provides sound scientific advice and guidance, including setting research, monitoring and evaluation priorities, and is responsible for implementing plans, evaluation and making recommendations on adaptive management techniques and liaising with Science Coordinators from species JVs, particularly the BDJV. It acts as a forum for discussion and integration of biological planning and evaluation at multiple spatial scales, facilitates technical information exchange and reporting, and helps to identify and communicate results of research, monitoring, and assessment to academia and NAWMP/NABCI partners. It reports on the status of biological foundations, evaluation results and implications for future conservation activities.

The Fiscal Committee governs the financial aspects of OEHJV initiatives and provides guidance to the Steering Committee on financial aspects of OEHJV. Its roles include tracking all approved expenditures by the OEHJV partners and providing annual reports on financial/fiscal matters.



Each partner agency plays a significant role in the implementation of the OEHJV programs and contributes to the collective objectives and goals of the partnership.

Appendix 2: Accomplishment Highlights 1986-2004

Through the efforts of all partners, almost 500,000 acres of wildlife habitat have been conserved from 1986 to 2004. Over \$130 million has been spent in Ontario to conserve, enhance and protect wetland habitats in the province. The majority of these accomplishments took place in the Great Lakes St. Lawrence Key Program Area (BCR 13).

By 2004, OEHJV partners had reached approximately 72% of the securement objective, 83% of the enhancement objective and 87% of the influence (stewardship) objective from the 1994 OEHJV IP.

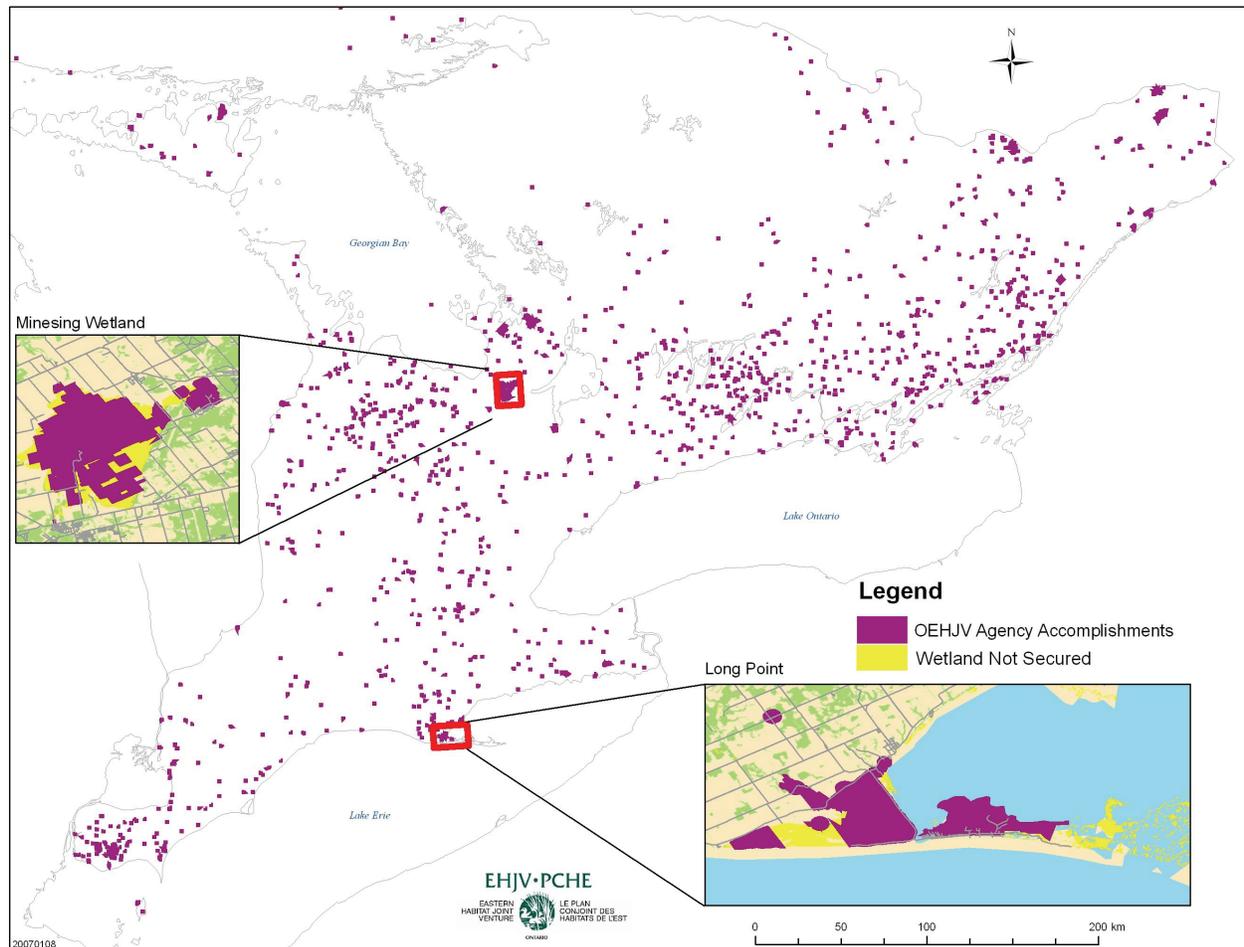


Figure 4: Accomplishments by all OEHJV Partners 1986-2004

Table 8: Accomplishments and Expenditures by all OEHJV Partners 1986-2004

Key Program Activity	Wetland Acres	Wetland Associated Upland Acres	Total Acres	Expenditures
1. Habitat Securement				
a) Acquisition				
Fee-simple purchase	37,492	9,206	46,698	\$22,677,459
Land donation	<u>1,094</u>	<u>681</u>	<u>1,775</u>	<u>\$790,769</u>
Total Acquisition	38,586	9,887	48,473	\$23,468,228
b) Other than acquisition				
Conservation agreement	59,725	60,635	120,360	\$16,309,609
Conservation easement	661	337	998	\$1,673,189
Crown designation	112,265	210,015	322,280	\$5,847,439
Cooperative land use agreement	207	1,349	1,556	\$26,000
Other	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Other Than Acquisition	172,858	272,336	445,194	\$23,856,237
Common Activities	n/a	n/a	n/a	\$6,152,000
Total Securement	211,444	282,223	493,667	\$53,476,465
2. Habitat Enhancement	176,937	275,388	452,325	\$23,365,167
3. Habitat Management	153,714	262,522	416,236	\$4,605,281
4. Continuing Habitat Project Operation	n/a	n/a	n/a	\$2,095,000
5. Stewardship				
a) Influence	16,449,520	657,193	17,106,713	\$34,491,069
b) Extension	<u>0</u>	<u>0</u>	<u>0</u>	<u>\$1,035,880</u>
Total Stewardship	16,449,520	657,193	17,106,713	\$35,526,949
6. Communication and Education	n/a	n/a	n/a	\$2,731,908
7. Coordination	n/a	n/a	n/a	\$8,872,232
8. Evaluation				
Assessment	n/a	n/a	n/a	\$422,833
Directed Studies	n/a	n/a	n/a	\$1,904,940
Monitoring	n/a	n/a	n/a	<u>\$930,538</u>
Total Evaluation	n/a	n/a	n/a	\$3,258,311
9. Policy Adjustment	n/a	n/a	n/a	\$657,397
10. Recon and Design	41,752	15,849	57,601	\$4,113,000
TOTAL	*	*	*	\$138,701,710

Data source: National Tracking System

* Note that acres are not additive; enhanced and managed acres are previously secured.

Table 9: Progress Towards Securing Priority Waterfowl Staging Areas in the Great Lakes St Lawrence Key Program Area (BCR 12/13) 1986-2005

FOCUS AREA	WETLAND AREA (Hectares)	* PLAN TARGET (Hectares)	WETLAND SECURED TO DATE (Hectares)				% TARGET
			pre '86	86 - '99	00 - '05	Total	
Lake St. Clair	13,000	9,750	351	202	80	633	7%
Long Point	8,100	6,075	3,205	769	190	4,164	69%
Big Creek Marsh	500	325	0	0	0	0	0%
Canard/Detroit Rivers	600	390	0	0	0	0	0%
Wolfe Island	1,200	780	0	103	103	206	26%
Minesing Swamp	6,000	3,000	0	2,890	509	3,399	113%
Amherst Island	1,100	550	0	340	0	340	62%
Matchedash Bay	2,200	1,100	80	794	0	874	79%
Morrisburg	600	300	0	399	0	399	133%
Rondeau Bay	1,100	550	15	0	0	15	3%
Bay of Quinte/ Prince Edward County	7,000	3,500	0	231	71	302	9%
Lake Scugog	1,500	600	8	0	0	8	1%
Cornwall	300	120	0	252	0	252	210%
Lower Grand River	1,350	540	0	182	0	182	34%
Presqu'ile Bay	200	80	70	22	0	92	115%
Cache Bay	200	80	0	103	0	103	129%

* securement targets

Description of Accomplishments

Stewardship accomplishments:

- *Influence* (Stewardship) total: \$35,526,949.
- *Influence* (Stewardship) total: 17,106, 713 acres (16,449,520 wetland acres, and 657,193 wetland-associated upland acres)

The *extension* activities of the EHJV program have also had significant positive influence on the distribution and quality of waterfowl habitat under private land management, beyond the over 16 million acres of wetlands influenced through stewardship initiatives.

Tax incentives provided by the government of Ontario recognize, encourage and support the long-term private stewardship of Ontario's provincially significant conservation lands (including wetlands) by providing property tax relief to those landowners who agree to protect the natural heritage values of their property. These incentives have positively influenced land use on approximately 300,000 acres of wetlands and wetland-associated uplands

Science accomplishments:

- *Evaluation* total: \$3,258,311

The OEHJV developed waterfowl goals based on breeding information gathered by CWS waterfowl surveys in Ontario. The OEHJV used estimates of total breeding population (e.g. for black ducks) to estimate the proportion breeding in Ontario. In addition, waterfowl monitoring programs were linked with OEHJV habitat conservation programs. Waterfowl production targets were developed by habitat type (e.g. KPA).

Major studies included:

Claybelt Waterfowl and Wetland Study:

OEHJV partners conducted an intensive, multi-year wetland habitat/waterfowl production study that related helicopter breeding pair and brood surveys to wetland habitat type and abundance. The results were combined with CWS-led BDJV surveys in adjacent parts of the Boreal Forest, and with site-specific investigations of intensive programs.

Beaver Pond Management Assessment:

A multi-year landscape level study of managed and unmanaged wetlands was undertaken in the mid-1990s. Helicopter breeding pair and brood surveys were conducted, and comparative wetland productivity was determined. Recruitment rates were not calculated, however waterfowl production was estimated by measuring breeding pair and brood densities by vegetation class and management type. Landscape level waterfowl benefits and a cost benefit analysis were calculated.

Southern Ontario Mallard Ecology Study:

The Mallard Ecology Study (MES) was a multi-partner directed study on breeding mallard populations at four sites in representative landscapes in the Mixed Woodland Plain of the GLSL. Although the MES was not an assessment of OEHJV programs, it was designed to provide insights into the nature of habitat types within various landscapes that mallards valued (adapted from Table 2, Hoekman et al. 2005, JWM 70(1)).

Waterfowl breeding pair surveys:

Waterfowl breeding pair surveys have been conducted in selective landscapes where intensive programs have been delivered. Breeding pair numbers have been documented to increase up to 24 times on some projects (e.g. Atocas Bay). Ongoing CWS breeding pair surveys, and those undertaken by the BDJV in some BCRs, provide long-term trend data across the BCR. Brood production assessments have been undertaken on completed wetland enhancement projects.

Hudson Bay Project:

The OEHJV has supported research of the Hudson Bay Project, which is focused on habitat (wetland). This research has been ongoing since 1993 and annual reports are generated to highlight the outcomes. Specifically, during the late 1990s and early 2000s, OEHJV funds were used to assess snow goose degradation of habitat in James Bay for three to four years.

Policy accomplishments:

- Policy Adjustment: \$657,397

Work was conducted by OEHJV partners to influence or modify existing legislation, programs and policies of federal, provincial or municipal governments that affect land use directly or indirectly and which pertain to the objectives of the OEHJV. Policies that were influenced included those pertaining to preservation of watersheds and wetlands, sustainable water-use practices and sustainable land-use practices.

Communication and education accomplishments:

- *Communication and Education*: \$2,731,908

Communication:

Progress and administration: OEHJV annual reports were generated for the first 10-years (from 1989 -1998), which offered insight into the accomplishments of OEHJV and its partner efforts. These reports were replaced by the NAWMP *Canadian Habitat Mattes*, which reported on the programs and progress of all Canadian JVs in one document. A 10-year report was prepared to provide details of the results achieved in the first decade of the OEHJV. The NTS was created specifically to track the activities and accomplishments of the various partners across Canada, and it supports the overall OEHJV reporting.

Education:

Several educational programs were developed by or with OEHJV partners as long-term investments to inform the general public. These included:

- In 1994, a Hudson Bay Lowland Environmental Studies Curriculum Project was produced by the Mushkegowuk Education (representing the interests of seven First Nations in the western James Bay and Hudson Bay region) and the OMNR with support from Wildlife Habitat Canada (WHC). This project was designed to create a comprehensive curriculum package to describe the HBLD environment, its critical habitats and create community awareness regarding the land and all of its inhabitants. This curriculum had major sections on the waterfowl and wetlands of the HBLD including elder information on conservation^{11,12}.
- Youth education programs such as DUC's Web Foot program were also delivered in southern Ontario through the school system. In addition, the Greenwing program also focused on youth education and was delivered outside the school system, largely in rural communities.
- Additional OEHJV education efforts delivered by the partners were focused on specific initiatives that supported conservation programs. The types of materials varied between agencies and were dependent upon their specific needs. Examples of their breadth include:
 - Web sites;
 - Billboards and project signage;
 - Materials to support attendance at various events, landowner workshops, trade shows, etc.;
 - Publications to support landowner education such as *Wetlands on My Lands* and *Why Wetlands*;
 - Partner fact sheets, extension materials and newsletters; and
 - Media relations and organizational support to project dedications and tours.

¹¹ The Hudson Bay Lowland Environmental Studies Curriculum Project: Phase One: Community Consultation. Mushkegowuk Education, Ontario Ministry of Natural Resources and Wildlife Habitat Canada. August 1994.

¹² The Hudson Bay Lowland Environmental Studies Curriculum Project: Phase Two Proposal: Community Curriculum Coordination. Kiskinnohamakaywi Weecheehitowin (Mushkegowuk Education), Ontario Ministry of Natural Resources, and Wildlife Habitat Canada. September 1994.

Appendix 3: BCR-Level Habitat and Waterfowl Assessment

Taiga Shield and Hudson Plains (BCR 7, WCR 7.1, HBLD KPA)

This BCR extends east and west onto the Precambrian Shield. The Hudson Bay Lowlands (HBLD) sit atop sedimentary rocks, mainly limestone, and dip gently northward from the Canadian Shield toward the shore of Hudson Bay, and cover about 25.7 million hectares. It consists of narrow strips of tundra along the coasts of Hudson Bay and the contiguous northwest James Bay, and of extensive forests of the Taiga Shield.

The subarctic climate is characterized by relatively short, cool summers with prolonged periods of daylight, and long, very cold winters. The poorly drained areas of the Hudson Plains support dense sedge-moss-lichen covers, with open woodlands of black spruce and tamarack in better-drained sites. Coastal marshes and extensive tidal flats are present along the coastline. The Precambrian Shield is characterized in upland sites and along rivers by open, mixed-wood forests of white spruce, balsam fir, trembling aspen, balsam poplar, and white birch. Further north, approaching the limit of tree growth, stunted black spruce and jack pine dominate, accompanied by alder, willow, and tamarack in the fens and bogs. Thousands of lakes and wetlands occur in glacially carved depressions, and peat-covered lowlands are commonly waterlogged or wet for prolonged periods due to discontinuous but widespread permafrost.

Overall, almost 57% of BCR 7 in Ontario is classified as forest, including 10% coniferous forest and 2% deciduous forest. An additional 2% is classified as disturbed and 38% is treed bog/fen. Non-forested classification makes up about 44% of the land cover, including 37% in wetlands. The abundance of water provides important habitat for breeding waterfowl. The coasts of Hudson and James Bay provide critical shorebird staging habitat, funnelling millions of birds southward during fall migration. Most of the land is unalienated provincial Crown land and there is very little human land use, with settlement primarily by aboriginal communities. Small Cree villages are scattered across the landscape, but are mainly found at the mouths of rivers. Land use activities are primarily related to outdoor recreation, although hydro-electric development, diamond mining and peat and petroleum extraction threaten wetland habitat.

Wetlands

This area contains the largest extensive area of wetlands in the world; coastal marshes and extensive tidal flats are present along the coastline, thousands of lakes and wetlands occur in glacially carved depressions and peat-covered lowlands are commonly waterlogged or wet for prolonged periods due to discontinuous but widespread permafrost. The lowlands are flat, poorly drained, and characterized by vast areas of swampy bogs and muskeg.

Inland, peat accumulations are high and fens and bogs dominate the landscape; tidal flats and salt or brackish water are replaced by beach ridge complexes that support a variety of wetland and upland habitats ranging from highly productive freshwater wet meadows, marshes, ponds, shallow lakes, sedge meadows and swamps, to upland forests on the higher ridges and levees.

Uplands

Tundra in this region is characterized by dry uplands with lichens and heath plants, low-lying fens with grasses and sedges, and up-lift beach regions, often with numerous ponds and lakes. Dwarf willow and birches occur in sheltered areas, while stunted spruces grow along river banks and increase in frequency near the low-land forest. Moss and lichen tundra occur on drier areas near the coast; open upland coniferous forests (taiga) develop along river levees and old beach ridges.

The Hudson Plains support dense sedge-moss-lichen covers, with open woodlands of black spruce and tamarack in better-drained sites. Upland and riverine Shield sites are characterized by open mixed-wood

forests; further north are stunted jack pine and black spruce, with some alder and willow in the fens and bogs. The lowland forest extends southward from the tundra and James Bay coast to an elevation of about 150 metres at the edge of the Canadian Shield. The forest is characterized by flat land with relatively poor drainage. Actual forest cover only accounts for 17% of the landscape.

The most northerly region along the coast of the Hudson Bay is primarily wetland (57%). Tundra makes up 2% of the remaining non-forested habitat. Forest habitat is roughly 34% of the region, including 4% dense coniferous forest, while both dense deciduous and burn classes each make up about 2%. Treed bogs and fens make up over 26% of the remaining land area.

Waterfowl

Most of the BCR's waterfowl value for both breeding and staging is associated with the coastal zones that stretch inland approximately 50 km and includes the rich coastal marshes and tidal flats; the highest breeding densities of waterfowl in the Province occur in this zone just west of the Severn River (> 600 IBPs/100 km²). Breeding waterfowl appear in generally low densities inland of this coastal zone (approximately 40 IBPs/100 km²). This pattern is shown in the distribution of breeding geese where both the southern James Bay and Mississippi Valley populations of Canada geese occur in high densities in this coastal zone. Lesser snow geese also breed in locally extremely high densities within the BCR, especially at the large Cape Henrietta Maria colony and smaller ones at West Pen and Akimiski Island. Breeding dabblers occurring in substantial numbers include the black duck, mallard, northern pintail and green-winged teal. It should also be noted that sizable breeding populations of divers, such as lesser scaup and ring-necked duck also benefit from the productive breeding habitat of the BCR. A wide range of other diving duck species also occur at lower densities: the scoters, long-tailed duck, greater scaup, common goldeneye, and bufflehead. Small numbers of common eider also breed annually in a few locations.

The extensive list of migrating and staging waterfowl is a reflection of the productivity of the coastal wetland habitats. Migrating and staging birds on the coast are comprised of not only the local breeding population and their offspring, but also more northerly breeding waterfowl that funnel along the coasts on migration. Also included are non-breeding birds and moult migrants that may come north from their breeding areas. Significant dabbler species include the black duck, mallard, northern pintail, and green-winged teal (9.3 million waterfowl use days during annual migrations). Also, the black scoter forms major summer moulting concentrations along the coasts (peak counts of 91,200). Significant staging numbers of geese include the temperate-breeding moult migrant and southern James Bay populations of Canada goose, the brant, and both the mid-continent lesser snow geese.

Boreal Softwood Shield (BCR 8, WCR 8 & 8.1, Boreal Forest KPA)

This region is underlain by the acidic, Archean bedrock of the Precambrian Shield. Ridged bedrock outcrops are covered with calcareous, sandy to loamy till in the north, and a thin acidic sandy till in the south. The exposed bedrock, sand plains, and rolling hills are interspersed with hundreds or thousands of lake and riverine systems; uplands are vegetated by communities of spruce-fir-aspen or jack pine-black spruce, while lowlands are dominated by pure black spruce or black spruce-tamarack forest. Northern portions of the BCR are characterized by dense coniferous forest with open water; peatlands, mixed forest and old burns make up the remainder of land cover.

Ownership is generally provincial Crown and First Nations lands, with patented tracts used for urban and recreational purposes along transportation corridors. Primary land uses are forestry, mining, hydro-electric production, outdoor recreation and tourism.

Wetlands

The northern portion of BCR 8 is a broadly rolling mosaic of uplands and associated wetlands, dotted with numerous small to medium-sized lakes. There are few wetlands in the east (less than 5%), but in the central and western portions they comprise up to 50% of the area. Although the biological productivity of these wetlands is relatively low, they are vast. Fens and bogs are the dominant wetland type, but swamps, beaver flooded areas and riverine or lacustrine marshes are also abundant.

Uplands

Overall, 96% of the land cover in BCR 8 is classified as forested; over half is coniferous and mixed coniferous forest, with lesser amounts of deciduous and mixed deciduous forest, regenerating successional forests created by clearcuts and burns, and treed wetlands. The proportion of disturbed forest is slightly higher in the east sub-region than in the west sub-region. Most early successional forests in the east are the result of forest harvesting; extensive areas of post-fire successional forest are present in the west sub-region.

Vast areas are more than 50-80% forested by closed stands of conifers (largely white and black spruce, balsam fir and tamarack). In southern portions of the BCR, broad leaf trees (e.g., white birch, trembling aspen, balsam poplar) and white, red and jack pine are more widely distributed.

Approximately 81% of the land in BCR 8 is Crown land, managed by the provincial government. An additional 14% consists of protected conservation lands, including national parks, provincial parks and conservation reserves. The remaining 5% includes private lands and reserves. Private lands are concentrated along the highway corridors and around some of the larger lakeshores.

Past forest management activities and the reduction of natural disturbances (e.g. fire suppression) have negatively influenced the distribution of deciduous forest habitats in this region. Deciduous species, particularly the shade intolerant aspen, are the preferred food of beavers which drive wetland abundance and quality in many portions of this BCR. If ongoing efforts to emulate natural disturbance patterns in forest management guidelines are successful, an overall increase in wetland abundance and habitat quality may result.

Waterfowl

The boreal forest provides habitat for breeding waterfowl which occur in comparatively low densities due to the low productivity of the Precambrian Shield landscape; the waterfowl density within the BCR ranges from 70 to 110 IBPs/100km² averaging 90 IBPs/100 km² based on most recent survey data. Although this is generally a lower value for breeding waterfowl compared to the other BCRs, the boreal forest is the largest in overall size and thus makes an important contribution to Ontario's waterfowl population.

The boreal region provides significant breeding habitat for black ducks, mallards, green-winged teal, ring-necked duck, common goldeneye and both hooded and common mergansers. The Canada Goose breeds in moderate numbers only in the western boreal.

This BCR is less important for staging habitat although some of the larger inland lakes hold moderate concentrations of staging ring-necked ducks and common goldeneye.

Boreal Softwood Shield (BCR 8, WCR 8.1, Northeastern Claybelt KPA)

The ***Northeastern Clay Belt*** within BCR 8 is 59,000 km² in size and is the remnant of a post-glacial lake (Lake Barlow-Ojibwa). It is characterized by glaciolacustrine clay deposits, lowlands with poor drainage, flat topography and accumulated organic matter. The area can be divided into the greater clay belt to the north and the little clay belt to the south, the latter of which has less productive mixed sand plains and

rock outcrops. Topography varies from flat to rolling. Over 75% of the terrain is interspersed with large lakes and rivers, and forests of black spruce, jack pine, balsam fir, trembling aspen and white birch.

The area is predominantly provincial Crown land, with private land occurring along highways and in areas of the little clay belt used for agriculture. Land uses include forestry, mining, some agriculture, outdoor recreation and tourism.

Wetlands

Wetlands constitute a significant proportion of the area. Wetland habitat varies from highly productive riverine and lacustrine marshes, beaver pond complexes and alder-lined streams to graminoid fens, ponds and extensive bogs.

Waterfowl

The productive clay soils found within the Northeastern Clay Belt provide the basis for the importance of the area for more northerly species of breeding waterfowl. These productive soils and associated habitat diversity differentiate the Northeastern Clay Belt from the remainder of BCR 8, which is the comparatively unproductive boreal forest to the west. These landscape characteristics are reflected in the density of breeding pairs, with the highest on the clay soils and lower numbers throughout the rock and sand plains as the Northeastern Clay Belt transitions into the Boreal Softwood Shield.

There are 8 duck and one goose species that are considered to be common breeding species in the Clay Belt. Breeding waterfowl densities for WCR 8, as reported by the Black Duck Joint Venture (BDJV), have averaged 110 IBPs/100 km² in the most recent surveys. The Clay Belt provides significant breeding habitat for mallards, black ducks, green-winged teals, and ring-necked ducks, common goldeneyes, and hooded and common mergansers. The southern James Bay population of Canada geese have recently increased in breeding pair numbers in the northern portion of the BCR adjacent to the HBLD.

A large portion of the Clay Belt is interspersed with large lakes that make suitable staging habitat for waterfowl migrating from the HBLD, or for local birds within the BCR itself. Moderate numbers of mallards, black ducks, ring-necked ducks, common goldeneyes and common mergansers use these areas during the migration periods. As well, the southern James Bay population of Canada geese stage in large numbers in both spring and fall on the clay belt, particularly in agricultural areas.

Boreal Hardwood Transition (BCR 12, WCR 12n, 12w and 12s, part of GLSL KPA)

The Ontario portion of BCR 12 encompasses 202,900 km² in two disjunct areas. The larger, eastern section extends from the eastern shorelines of Lake Superior and Georgian Bay to the Ottawa River. The western section forms a 100-km-wide strip along the Ontario-Minnesota border. BCR 12 encompasses about one-fifth (21%) of the total area of Ontario.

Over two-thirds of Ontario's BCR 12 is Crown land, managed by the provincial government. Approximately 10% of the land base is specifically managed as conservation lands, which include national parks, provincial parks and conservation reserves.

Wetlands

The natural landscape of this region is a mosaic of deciduous, mixed and coniferous forest stands. Numerous small patches of non-forested habitats, including open wetlands, riparian meadows and rock barrens, as well as lakes and streams, are scattered within the forest matrix. In southern portions of the BCR, Great Lakes coastal estuaries, rivers, large shallow lakes and natural wild rice lakes are used by many breeding and migrating waterfowl and other birds.

Uplands

Dense deciduous, mixed deciduous and sparse deciduous forests together comprise 44% of the land cover of BCR 12 in Ontario. Large blocks of disturbed forest, including recent and old cuts and burns comprise about 7% of the land cover. Across the region, the proportion of disturbed (cut and burned) forest ranges from just over 1% in the southeast sub-region, to about 10% in the northeast sub-region, and closer to 15% in the western sub-region.

Early successional forest habitats are inherently ephemeral, maturing into forest after a period of time ranging from about ten to thirty years, depending on the site conditions and management treatments. Many of these disturbed land cover areas present in the 1990s mapping will have matured into young forest by now, and many new disturbed areas will have been created.

Waterfowl

Breeding ducks are well distributed throughout this BCR, fairly stable water conditions allow for consistent reproductive success. Mallards, black ducks, wood ducks, green-winged teals, ring-necked ducks, common goldeneyes, and hooded and common mergansers are waterfowl species commonly found in this region. Beaver ponds provide a significant amount of waterfowl habitat in the BCR and are especially important to cavity nesting species such as hooded merganser, wood duck and common goldeneye. Temperate-breeding Canada geese have adapted quickly to this habitat and are found in increasing abundance along the Precambrian shield-limestone interface. Waterfowl indicated breeding pair densities range from 110 IBPs/100 km² in the north near the boreal forest (BCR 8) to as high as 210 IBPs/100 km² in southern portions of the BCR.

Staging waterfowl habitat within the BCR consists of both inland habitat and the coastal habitat of the upper Great Lakes. Inland staging habitats include abundant lakes, many of which have stands of wild rice that provide food resources for the early staging period in the fall. The Kawartha Lakes and other large bodies of water along the shield interface are regionally important diving duck migration stopovers. The open waters of Georgian Bay and Lake Superior also provide some migration and staging habitat.

Lower Great Lakes/St. Lawrence Plain (BCR 13, WCR 13, part of GLSL KPA)

The general topography of this a BCR is subdued, with elevations below 50 metres. The Niagara Escarpment, a 30 to 50 metre high ridge of limestone, runs approximately 400 kilometres north from Niagara Falls through the Bruce Peninsula to Manitoulin Island. The Frontenac Axis divides the BCR into the St. Lawrence Lowlands to the east and the Great Lakes Lowlands to the west. Vegetation is diverse, characterized by mixed deciduous-evergreen forests and tolerant hardwood forests, areas of Carolinian forest, alvars and tallgrass prairies. This region has the highest human population density in Canada. Most land is privately owned, but there are a number of protected areas owned by Conservation Authorities and/or Crown corporations. Land use is highly varied, but is dominated by agriculture and urban development.

Wetlands

The Lower Great Lakes/St. Lawrence Plain is the most significant of the four BCRs in the province for the OEJV. Its wetlands are the most productive and yet it is a region of intense development pressure, resulting in high wetland losses and degradation. The original wetland base in the southern portion of the BCR, where wetland loss has been most significant, is estimated to have been 2.38 million hectares. The original wetland areas in non-shield portions of the BCR have been reduced by almost 70%.

In the extreme southwestern portion of the BCR, over 90% of the original wetlands have been converted to other uses. Although most wetlands have been eliminated, some coastal marshes, deciduous and coniferous swamps and open fens remain scattered throughout the region. Lake Erie coastal marshes

support the largest diversity of flora and fauna in the Great Lakes. Remnant wetlands along the shoreline of the lower Great Lakes and associated rivers are considered of major significance to staging waterfowl.

Uplands

Overall, 30% of the land cover in this BCR is classified as forested, composed primarily of dense upland forests with occasional sparse forests and swamp forests. The amount of forest cover increases from south to north and from west to east. Total forest cover ranges from less than 14% in the southwest sub-region to 67% in the northwest sub-region. Less than 3% forest cover remains in Essex County, at the extreme southwest corner of this region. Deciduous forests are predominant in the southwest sub-region, whereas other parts of the region contain a mosaic of deciduous, mixed and coniferous forests. Urban land cover comprises 3% of land cover in southern Ontario and it is concentrated in the southwest.

Waterfowl

The Lower Great Lakes/St. Lawrence Plain provides significant value to waterfowl throughout their life cycle in terms of breeding, staging and wintering habitats. BCR 13 yields some of the highest breeding waterfowl densities in the province, recently (2003) as high as 233 IBPs/100km² across the BCR. This is primarily due to the productivity of the deep mineral soils and the abundance of wetland and waterfowl habitat in some portions of the landscape. Data indicate a stabilization in the total densities of waterfowl in BCR 13. Since the mid-1970 estimate (approximately 134 IBPs/100 km²), populations appear to have plateaued at densities between 259 IBPs/100 km² (estimated during the 1988 to 1993 period) and 223 IBPs/100 km² (estimated in 2000 to 2003).

The BCR provides significant breeding habitat for mallards, green and blue-winged teals, wood ducks, ring-necked duck, hooded merganser and temperate-breeding Canada geese.

The Great Lakes coastal wetlands provide continentally significant staging habitat and the unfrozen/open water component of the lakes themselves provide increasingly important wintering habitat for hardy diving ducks, geese and swans. The most significant staging value is afforded to black ducks, mallards, the bay ducks (canvasback, redhead, ring-necked duck, and lesser and greater scaup), bufflehead, common goldeneye, common and red-breasted mergansers, and both surf and white-winged scoters. Birds from the Mississippi and Atlantic flyways pass through the area on their flights both north and south. Staging waterfowl numbers peak in the province in mid-October, with approximately 29 million (M) total Waterfowl Use Days (WUD) in the Lower Great Lakes/St. Lawrence Plain on an annual basis (spring and fall). Annually, dabblers represent just under 10M WUD, divers approximately 19M WUD and geese 0.6M WUD. For several continentally important species, Ontario's staging habitat is of paramount importance. For example, 29% of the continent's canvasback population were found staging on Lake St. Clair in the 2006 mid-winter survey. Use of the Great Lakes as over-wintering habitat has increased as the number of ice-free days grows, providing a larger habitat base for an increased duration. Several inland areas also provide important staging habitat.

Appendix 4: Threat and Stressor Evaluation and Recommended Program Activities

Geographic Area

BCR 7: Taiga Shield and Hudson Plains
 BCR 8: Boreal Softwood Shield
 BCR 12: Boreal Hardwood Transition
 BCR 13: Lower Great Lakes/St Lawrence Plain

HBLD: Hudson Bay Lowland KPA
 BFOR: Boreal Forest KPA
 CLAY: Northeastern Clay Belt KPA
 GLSL: Great Lakes St. Lawrence KPA

Note: Threats/stressors in bold are those that will receive priority focus over the next five years.

Program Activities (see Appendix 5 for a description of each activity)

Acq: Securement - Acquisition
 Com: Communication
 DS: Evaluation - Directed Studies
 E: Habitat Enhancement
 Edu: Education

Ext: Stewardship - Extension
 Inf: Stewardship - Influence
 M: Evaluation-Monitoring
 Mgt: Habitat Management
 PA: Policy Adjustment

Threat Category	Stressor	Habitat, Species, Geographic Area	Description of Threat/Stressor	Recommended Program Activities	Link to OEJV Actions *
Habitat Loss / Alteration / Fragmentation / Degradation	Urban Development	All Birds All Habitats BCR 13 (GLSL)	Great Lakes coastal wetlands are degrading due to intensive industrial, agricultural and residential development. In BCR 13, intense development pressure has led to high wetland loss and degradation; the area is dominated by urban areas. Recreational cottaging is a significant land use in the central portion of BCR 13 (Georgian Bay and Muskoka regions). Dredging, draining, excavating or filling wetlands to establish development can negatively impact the function of the wetland as staging, moulting, nesting or foraging habitat. In addition to a direct loss of available habitat area, reducing the size of the wetland can reduce storage capacity and subject the wetland to higher water levels; such deeper water areas can reduce the extent and diversity of aquatic submergent and emergent vegetation which is critical foraging habitat for many waterbirds. Many waterfowl species require large wetlands during moulting (to ensure safety from predators and disturbance); reducing the size of wetland habitat may make the wetland less suitable for moulting waterfowl. Highway construction can have a major impact of the hydrologic functions of wetlands (e.g. through alteration of the hydrologic regime, sediment loading and direct wetland removal).	Maintain existing habitat, enhance/restore habitat when possible, and secure additional habitat using: Ext, Acq, E, PA, Mgt, Inf, M, Edu	1.1 to 1.4 2.1 to 2.5 3.4 3.6 3.9 to 3.16 4.1 to 4.7

Threat Category	Stressor	Habitat, Species, Geographic Area	Description of Threat/Stressor	Recommended Program Activities	Link to OEJV Actions *
	Agricultural Conversion	All Birds All Habitats BCR 13, 8 (GLSL, CLAY)	Some parts of the Boreal BCRs have been altered by some conversion of forest to pasture. In the Clay Belt portion of BCR 8, clearing and draining for agricultural (small grain and livestock) purposes has threatened wetland and upland habitat. The extreme southwest portion of BCR 13 has been converted to intensively cultivated row crops. The extreme southwest region of BCR 13 is the most imperilled region in Canada because of the amount of natural habitat that has been drained, cut and converted into agricultural and suburban land uses; very few wetlands or forests remains, most having been converted to intensively cultivated row crops. Extensive farming occurs in the southeast portions of BCR 13. Avian biodiversity in BCR 13 on farmlands is strongly influenced by land management practices (e.g. crop types, tillage, pesticide use, chemical fertilizers, and field size) and landscape composition (e.g. availability and distribution of pasture, hayfields, woodland, fencerows, and riparian corridors).	Maintain existing habitat, enhance/restore habitat when possible, and secure additional habitat using: Ext, Acq, E, PA, Mgt, Inf, M, Edu	1.1 to 1.4 2.5 3.11 3.13 3.14 4.6 4.7
	Peat Extraction	Wetlands BCR 7,8,12, 13 (GLSL, BFOR, HBLD)	Peat mining involves the removal of peat from bogs and fens, altering the habitat drastically. Peat prospecting is increasing in BCR 8 as governments, industries and communities seek to find alternate sources of fuel and revenue. Removing peat results in direct loss of wetland area and may alter the hydrologic regime of the wetland and its adjacent lands.	Minimize impacts on bird populations and habitat using: PA, Com, Edu, Inf	4.6 2.1 to 2.5 1.4
	Timber Extraction	Uplands Wetlands All Birds BCR 8, 12, 13 (BFOR, CLAY, GLSL)	Road crossings through wetlands for timber extraction purposes may disrupt wetland hydrology. Deforestation of uplands adjacent to wetlands can impact wetland species that nest or forage in adjacent uplands as well as directly affect water quality entering wetlands. Extensive areas in the BFOR have been significantly disturbed by large-scale mechanized logging. Habitat fragmentation in the boreal forest has principally occurred as a result of forestry practices (clearcuts and logging roads). Forest harvest prescriptions (choice of harvest method, patch size and configuration and rotation cycles) can have important impacts on landbirds.	Determine effects and develop appropriate recommendations using: DS, M, PA, Inf	3.20 4.6 1.4 5.10
	Fire Suppression	Uplands Wetlands Landbirds BCR 8, 12 (BFOR)	Fire suppression often results in a change in natural fire patterns. The Boreal forest is exceptionally well adapted to disturbance in the form of fire. Fire suppression can impact forest landbirds because it alters the forest composition and can increase the potential for catastrophic fires. In addition, fire suppression may affect beavers by altering the availability of early successional trees such as aspen which may affect wetland availability and quality.	Determine effects and develop appropriate recommendations using: DS, M, PA, Inf	3.20 4.6 5.10

Threat Category	Stressor	Habitat, Species, Geographic Area	Description of Threat/Stressor	Recommended Program Activities	Link to OEJV Actions *
	Waterpower Operations	Wetlands Waterfowl Waterbirds (BFOR, CLAY, GLSL, HBLD)	Construction and operations of hydro-electric dams. Water level fluctuations resulting from waterpower operations (e.g. the construction and operations of hydro-electric dams) can alter the shoreline habitat needed by species for breeding and feeding (e.g. excessive flooding of normally 'dry' areas or drawdowns in normally inundated areas). Changes to wetland water levels may affect the distribution of aquatic vegetation or may affect the ratio of emergent to open water, resulting in habitat that is undesirable to some waterfowl species. Lower water levels may create habitat unsuitable for waterfowl species that prefer deeper, open water. Higher water levels may result in less aquatic vegetation and more open water, making the habitat unsuitable for waterfowl species that prefer extensive stands of emergents, shoreline shrubs or shallow water. Alternatively, lower water levels may expose some nests initially built over shallow water, making them more vulnerable to predation and the lack of open water may discourage some bird species from nesting. If water levels fluctuate more than normally, nests may be flooded or exposed.	Determine effects and develop appropriate recommendations using: DS, PA, M, Inf	4.6
	Mining (Mineral & Petroleum)	All Habitats All Birds BCR 7, 8, 12 (HBLD, BFOR, CLAY)	Extracting large amounts of mineral can impact the hydrology of the surrounding landscape by lowering water levels or by re-directing water flows. This altered hydrologic regime can "dry" out wetlands, resulting in a loss of habitat to many bird species.	Determine and minimize effects on bird populations and habitat using: DS, PA	4.6
	Exotic Species	Wetlands Uplands Waterfowl Waterbirds BCR 13 (GLSL)	Non-native species (e.g., carp, purple loosestrife, common reed) introduced into wetlands can outcompete native species, change food resources and disrupt the natural balance of the ecosystem. The introduction of zebra mussels may have affected some waterfowl populations through bio-accumulation of chemicals and waste products. They may also be responsible for large-scale die-offs of many waterbirds due to botulism.	Determine effects and develop appropriate recommendations using: DS, M, PA, Inf	
	Aggregate Extraction	Wetlands All Birds BCR 7,8,12, 13 (GLSL, BFOR, HBLD)	Aggregate extraction occurs primarily in southern areas of the province and may cause changes to the watershed's water budget. Natural areas may receive increased or decreased water flow as a consequence of diversion or pumping schemes. There can also be drawdowns of adjacent water tables as open pit areas are dewatered. This change in hydrologic regime can alter the vegetational composition of the area, potentially resulting in less desirable areas to bird species.	Minimize impacts on bird populations and habitat using: PA, Com, Edu, Inf	4.6 4.3 4.1
Contaminants	Acid Precipitation	Wetlands Waterfowl Waterbirds BCR 8, 12, (BFOR)	Waterbirds respond to lake acidification through the indirect influences of acidity on the availability and quality of their food (changes to fish communities, types of invertebrates available and nutritional quality of foods e.g. low calcium content, mercury presence) and through changes to their habitats.	Determine effects and develop appropriate recommendations using: DS, M, PA, Inf	

Threat Category	Stressor	Habitat, Species, Geographic Area	Description of Threat/Stressor	Recommended Program Activities	Link to OEJV Actions *
Human Disturbance	Pollution / Toxic Contaminant	Wetlands Landbirds Waterfowl Waterbirds BCR 8, 12, 13 (GLSL)	The introduction of toxic chemicals, nutrient enrichment or excessive sediment deposition can alter the natural physical characteristics of a wetland and lead to a change in species structure and overall habitat quality. Increases in turbidity due to higher sediment and nutrient loadings may reduce the depth that sunlight penetrates in to the water column, ultimately reducing the areas of the wetland that is capable of supporting aquatic submergent vegetation. The lower Great Lakes and their wetlands are particularly impacted by industry outfalls, sewage treatment, and toxic chemical contamination. Lead poisoning from lead shot and fishing tackle has caused death and other effects in waterfowl for over 30 years. Lead poisoning may weaken birds, so they are more susceptible to disease. Atmospheric pollutants can impact landbirds.	Determine effects and develop appropriate recommendations using: DS, M, PA, Ext, Inf	
	Windpower Operations	All Birds BCR 7, 13, 12 (HBLD, GLSL)	Facilities may disturb birds and/or kill birds that strike turbines or supporting infrastructure.	Determine and minimize effects on bird populations using: DS, PA, Ext, Inf	4.6
	Boating / Shipping	Wetlands Waterbirds BCR 13, 12 (GLSL)	Wetlands located in Great Lakes connecting channels that serve as shipping lanes can be impacted by increased wave action and dredging. Altered flow rates can result in changes in wetland dynamics resulting in the erosion of some wetlands and sedimentation in new areas. Wetlands may be disturbed by wave action and nesting birds may be disturbed by noise created by passing motor boats. Most bird species are sensitive to human disturbance.	Minimize impacts on bird populations using: DS, M, PA, Inf, Com, Edu	
	Water Level Regulations	Wetlands Waterbirds Waterfowl	Water level regulations (e.g. Great Lakes) can potentially decrease wetland size and diversity	Determine effects and develop appropriate recommendations using: DS, M, PA, Inf	
	Off-road Vehicles	Wetlands Uplands Landbirds Waterbirds BCR 8, 12, 13, (GLSL, BFOR)	The use of off-road all terrain vehicles in sensitive landscapes such as wetlands can degrade the area (e.g. rutting) and disrupt plant and animal habitats. Off-road vehicles can produce excessive levels of noise and noxious emissions that are capable of having a significant long-term, cumulative impact on wetlands as well as bird populations if reproductive success declines.	Minimize impacts on bird populations and habitat using: PA, Com, Edu, Inf, Acq, E	
	Recreation	All Birds	Use of natural areas by humans for recreational purposes (nature enjoyment, hiking, hunting, fishing, etc) can sometimes disrupt sensitive breeding birds.	Increase public awareness using: Com, Edu	

Threat Category	Stressor	Habitat, Species, Geographic Area	Description of Threat/Stressor	Recommended Program Activities	Link to OEHJV Actions *
	Over-Harvest	Waterfowl	The harvest of waterfowl species is regulated and monitored. It is not believed that over-harvest is a significant threat to waterfowl populations.	N/A	
	Waterfowl Disease	Waterfowl BCR 13 (GLSL)	Diseases include botulism and avian cholera.	Determine effects and develop appropriate recommendations using: DS, M, PA, Inf	3.3 to 3.8
Biological Threats	West Nile Virus	Wetlands Landbirds BCR 12, 13 (GLSL)	West Nile Virus (WNV) may infect and kill certain species of landbirds in Ontario; however, the concern with WNV resides chiefly in its perceived threat to human populations – wetland habitats may be filled or drained due to public misconceptions of mosquito breeding habitat. In addition, application of noxious adulterants to wetland areas in an effort to control the spread of WNV has the potential to impact sensitive bird species (either through direct effects or through alteration of food web dynamics).	Minimize impacts on wetlands and increase positive communications using: Com, Edu, Ext	
	Competition	All Birds BCR 13 (GLSL)	An overabundance of common species (native or non-native) may cause interspecific competition, threatening rare or less competitive species populations.	Determine effects and develop appropriate recommendations using: DS, M, PA, Inf	2.6, 4.8
Climate Change		All Birds All Habitats BCR 7, 8, 12, 13 (HBLD, GLSL, BOFR, CLAY)	Shifting vegetation communities and changes to water levels due to warming temperatures and changes in precipitation patterns. Changes to distribution and abundance of Great Lakes coastal wetlands are being studied/modelled. Widespread impacts not well known. Long-term research, monitoring and predictive modelling are key activities required to help understand, adapt and/or mitigate any impacts.	Determine and predict effects on bird populations and wetland habitats using: DS, M, PA, Inf	3.19

*Note: This column identifies direct links between the threats and the planned OEHJV actions identified in Table 5 (section 5.1) of this Implementation Plan. Although many of the actions identified in Table 5 may not be directly linked to mitigation of the priority threats (**in bold**) identified above, most do contribute to threat reduction by: a) increasing awareness, b) communicating accomplishments and c) creating a baseline of information from which to calculate trend through time measures.

Appendix 5: Description of Key Program Activities

The OEHJV determined very early that a range of both direct and indirect activities would be necessary to implement its program and meet its objectives. The key program activities used to deliver OEHJV conservation programs are described here. Specific actions related to these activities for this IP are described in Section 5.1. While many of the activities described below may benefit all birds and all habitats, activities A-H are linked mainly to NAWMP for the benefit of waterfowl, wetlands and wetland-associated upland habitat. Activities for the three other bird pillars (shorebirds, waterbirds, landbirds) and their habitats are included within activity I. In the future NABCI and NAWMP activities may be more fully integrated.

A. Habitat Securement

A landowner may choose to transfer land tenure to an OEHJV partner to ensure the long-term conservation of its natural value. Land tenure can be transferred either through a fee simple acquisition or through an easement agreement. Other options include agreements that do not transfer tenure but confer certain rights and responsibilities on the landowner and the OEHJV party to the agreement.

Fee Simple Acquisition:

A fee title transfer is the simplest and most secure method of protecting land and the wetlands and other habitat it supports. With fee title, the OEHJV partner can manage the property in perpetuity to meet its priorities, with consideration of the priorities of the surrounding community.

In a fee simple acquisition, land can either be donated to or purchased by an OEHJV partner. Landowners who do not donate outright might be willing to explore the possibility of a sale/donation combination, giving OEHJV partners the opportunity to do more conservation with fewer resources.

Landowners may want to conserve the habitat values on their property while also ensuring that they (and perhaps their descendents) can continue to enjoy certain activities on the land. In these situations, OEHJV partners can explore strategies that will accommodate the landowners while ensuring that OEHJV partner goals are met, such as taking an easement, or taking title while the vendor retains a life interest.

Land Donation:

This sub-activity of “Acquisition” tracks expenditures and accomplishments associated with securement activities where the landowner voluntarily transfers a land title to the recipient without payment. Land donations can be outright gifts, reserved life estates or land donations by devise.

Easements:

A conservation easement restricts the landowner’s activities on the land (or part of the land) and gives the easement holder the right to perform certain activities on the lands. In addition, the easement may require the landowner to perform certain specific activities. For example, an easement may remove the right to subdivide from the landowner, and may require the landowner to keep fences in good repair. The easement holder usually has the right to enter the land to ensure the landowner is meeting obligations under the easement.

Conservation easements are a significant addition to the conservation toolbox; advantages include flexibility and lower up-front costs. Conservation easements can be tailored to specific landscapes and conservation values, and to the goals of both parties. For example, easements can allow for economic or recreation activities while ensuring that habitat values are maintained.

Conservation Agreements:

Conservation agreements are usually 25-year or longer (minimum 10-year) securement agreements between sponsoring agencies and landowners, which may not be registered on title. Landowners

maintain all property rights and can assume responsibility for maintaining projects, although the sponsoring agency typically assumes full management responsibility to ensure optimal project performance. These no-cost agreements contain restrictions against future uses of the land, for the purposes of wildlife habitat management.

B. Habitat Enhancement

The loss and degradation of wetlands in Southern Ontario – estimated at an average of 80% – is very significant. A number of enhancement and restoration techniques are used to conserve and improve wetlands and associated uplands.

Degraded wetlands are enhanced with a range of engineering techniques, including the construction of earthen berms, the installation of water control structures or excavation to address impacts on wetland hydrology. These types of wetland projects are used to restore and/or enhance wetland function and values, and may provide small ephemeral and vernal ponds for waterfowl pairing habitat or larger permanent wetlands for brood habitat and for other wetland-associated species.

Projects are strategically located to provide the greatest benefits to waterfowl possible. They also enhance water storage and water quality within a watershed, and help maintain shallow groundwater levels which provide added benefits to crop production in surrounding fields.

Installation of nesting structures can, in some cases where large cavity trees are of limited availability, increase the carrying capacity of cavity nesting species in wetlands.

Invasive species removal and select plantings of native species such as wild rice may be conducted in existing wetland habitats. To enhance upland habitats for nesting waterfowl and other grassland birds, areas may be planted with appropriate native grass species such as big and little bluestem, switch grass, or where required, maintained in tame agriculture forages.

In farming communities, upland areas associated with wetlands are secured and nesting areas enhanced with modified agricultural techniques such as conservation tillage practices, livestock grazing practices and alternate watering systems. The use of flushing bars on hay mowing equipment minimizes hen loss and provides the hens with opportunities to re-nest and clutch again. Grassland establishment on marginal lands provides upland nesting cover, and native tree and shrub planting increases habitat diversity and buffer quality to improve nesting success.

C. Habitat Management

Management activities help ensure maximum benefits of projects for the long term are maintained. OEHJV has secured 211,444 wetland acres since 1986, which represents a significant asset and provides habitat for waterfowl, as well as other wetland-dependent wildlife. Activities that help maintain these values include water level management, repairing fences and equipment, maintaining water control structures, managing beaver and muskrat activity, managing upland vegetation, and cleaning, repairing and monitoring nesting structures. For many secured properties, property-specific management plans are developed. OEHJV partners assist in the development and review of such plans, and where appropriate, assist with the implementation of management activities (in some cases with the assistance of volunteers). Management planning includes a review of historic vegetation communities and assessment of the feasibility of restoration of habitat to historic conditions. Traditional recreational use is also reviewed to assess the feasibility of continuing or restoring traditional uses as part of the overall enhancement or restoration process and to manage native and non-native game species.

D. Stewardship

Stewardship activities promote or directly result in the sustainable use of land for the purposes of conserving wildlife and the habitats on which they depend.

Extension services provide information and professional habitat advice to private landowners who learn about the impacts of land use on wetlands, watersheds and natural areas. These services sow the seeds for land stewardship and future enhancement or restoration projects, which are direct actions that result from the landowner's own activities, without legal or binding agreements.

Influence: This component of stewardship includes direct actions taken by landowners, land managers or conservation agencies that protect or enhance wetland and upland habitats without legal or binding agreements. These direct actions result in applied land use changes and both the expenditures and the accomplishments (acres affected or influenced by these actions) are tracked.

E. Communication and Education

Communication and education activities include the promotion of program materials to generate broader awareness of OEHJV achievements, to stimulate program integration and to foster efforts to attract additional partners and funding. Activities include public relations, displays, brochures, press conferences and presentations.

F. Policy Adjustment

Policy Adjustment refers to work conducted to influence or modify the existing legislation, programs and policies of federal, provincial or municipal governments that affect land use directly or indirectly, and which pertain to the objectives of the OEHJV. Policies that are influenced include those pertaining to conservation of watersheds and wetlands, sustainable water-use practices and sustainable land-use practices.

G. Evaluation

A number of evaluation activities have been undertaken, and will be ongoing in the OEHJV. In the past, activities were directed primarily to waterfowl and waterfowl habitats, but this will expand to encompass a broader spectrum of birds and habitats. Evaluation activities have included:

Assessment:

This includes research projects that are approved for funding within proposals under NAWCA, activities that evaluate the impact of EHJV/OEHJV programs on waterfowl populations and habitats;

Directed Studies:

This includes research that expands knowledge of waterfowl and waterfowl habitat; and

Monitoring:

Monitoring of waterfowl and other wetland-dependent migratory birds, wetlands and associated upland habitat and habitat changes is critical to further understand the effectiveness of OEHJV programs.

H. Reconnaissance and Design

This includes primarily broad scale planning activities related to biological, agrological and engineering planning which occur prior to actual program delivery. Examples include feasibility studies and construction plan designs.

I. Planning and Implementation Activities under NABCI

While not part of the OEHJV program activities eligible for funding under NAWCA, activities conducted by OEHJV partners to implement NABCI are periodically undertaken. These activities include: inventory and monitoring, development of conservation plans for NABCI bird pillars (landbirds, waterbirds, shorebirds), and implementation of bird plan recommendations on the landscape (either directly by OEHJV programs or by complementary programs).

Appendix 6: Indicated Breeding Pair Densities and Waterfowl Priority Setting

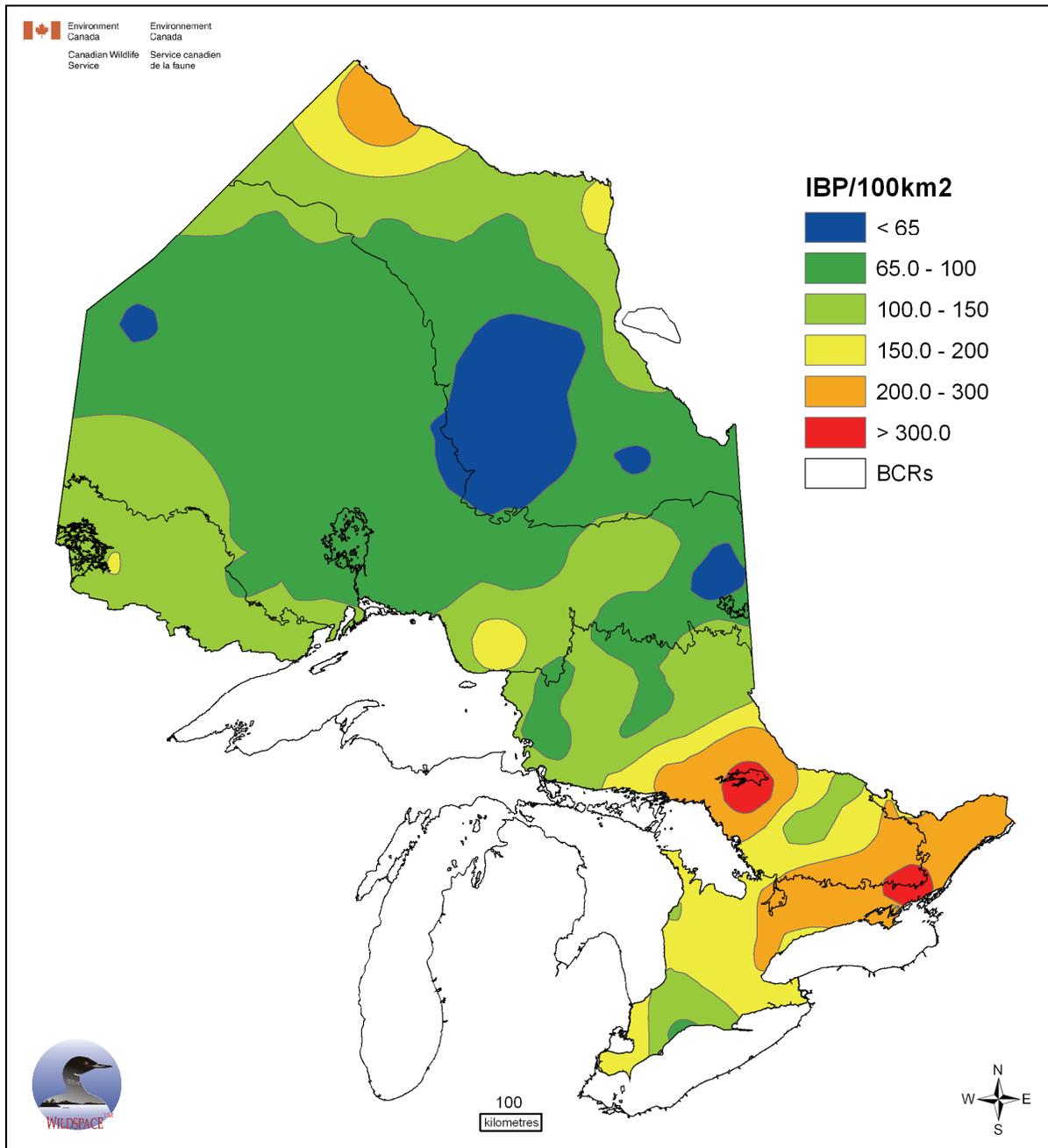


Figure 5: Average Indicated Breeding Pair Densities for Waterfowl (excluding Canada Geese) in Ontario

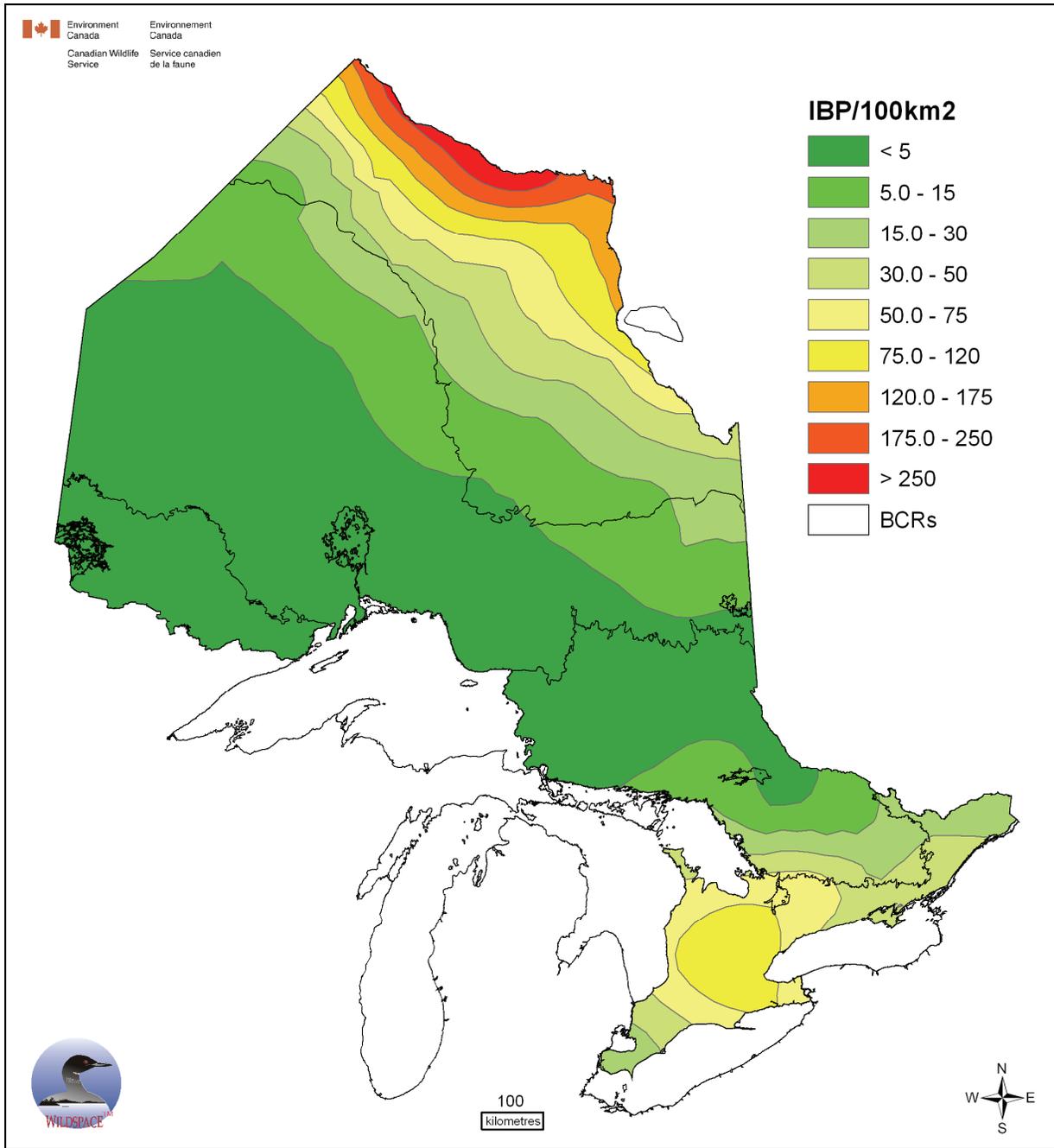


Figure 6: Average Indicated Breeding Pair Densities for Canada Geese in Ontario

Priority Waterfowl Species Selection

Species were selected for inclusion as a priority species for each WCR based on several criteria. As a first step, the NAWMP derivation of continental priorities for North American ducks, geese and swans was used (NAWMP 2004 - Implementation Framework). Any species that had been classified as a moderate continental priority or above (moderate, moderate high or high) were included. This applied to waterfowl both during breeding and non-breeding phases. The classification of each species in Ontario was adjusted by expert opinion. Species were added if they were of significant regional management concern or high regional responsibility. Species were removed if they had low regional responsibility or if actions at the regional level would not affect significant portions of the population.

Appendix 7: Relevant Surveys and Banding Programs Currently Conducted in Ontario

CWS Eastern Waterfowl Survey

Type: Breeding pair (waterfowl).

Location: Central and northeastern Ontario.

Temporal Extent: 1990-present (ongoing)

Georeferenced: Yes

Habitat information: Not collected.

Method: Annual spring helicopter survey during nest initiation; 5x5km plots; 20 plots per year; rotating sample out of 40 plots.

Target species: All waterfowl, also provides useful information on other waterbirds including loons, herons, and cranes.

Agency: CWS

CWS Southern Ontario Breeding Waterfowl Survey

Type: Breeding pair (waterfowl).

Temporal Extent: 1971-present (ongoing)

Georeferenced: Mostly- eventually all of it will be

Habitat information: Yes- it is collected.

Location: Southern and Central Ontario.

Method: Annual spring ground survey during nest initiation; half-mile square plots; 175 plots per year; rotating sample out of 350. Currently being spooled up to annual survey and will be integrated into eastern waterfowl survey.

Target Species: All waterfowl; data on other species not assessed.

Agency: CWS

USFWS Breeding Waterfowl Transect Survey (integrated with Eastern Waterfowl Survey)

Type: Breeding waterfowl.

Location: All of Ontario.

Temporal Extent: variable, depending on the location within the province. Survey over all of Ontario commencing in 2006. NW Ontario has been surveyed since the mid-1960s or earlier. Different areas have been surveyed since the mid-1960s.

Georeferenced: Partially- can backtrack as to where observations were made since surveys are conducted along a transect.

Habitat information: not collected

Method: Annual corrected fixed-wing aircraft transect survey; all transects covered each year.

Target Species: All waterfowl; data on other species not assessed.

Agency: USFWS

Integrated Breeding Waterfowl Survey of Eastern Canada

Ultimately this would be an integration of the above three surveys so that overlap is eliminated and a single estimate is produced each year. For a few years, there would be considerable overlap with the USFWS survey in Ontario.

Spring Population Surveys of Northern-breeding Canada Geese

Type: Breeding Canada Goose (Mississippi Valley and Southern James Bay Populations).

Location: Hudson Bay Lowlands.

Temporal Extent: 1989- present (ongoing)

Georeferenced: Yes

Habitat information: not collected

Method: Annual fixed-wing surveys of randomly located 10-km transects (c165 total) during mid incubation.

Target Species: Canada Geese; useful information is also gathered on Sandhill Cranes.

Agency: OMNR and CWS

Waterfowl Pair and Brood Survey of the Northern Clay Belt

Survey completed

Type: Breeding Pair and Brood (waterfowl).

Location: Northern Clay Belt.

Temporal Extent: 1988 and 1990 but not since.

Georeferenced: Yes

Habitat information: Yes- Collected

Method: Spring helicopter surveys during nest initiation, and summer brood surveys; 2x2km plots spread in a randomized grid throughout the Northern Clay Belt of Ontario; surveyed in the springs and summers from 1988 to 1990; provides a framework for repeat surveys to assess population changes in the region.

Target Species: All waterfowl.

Agency: OMNR, CWS, DUC

Migrant Waterfowl Survey of the Major Shorelines in Southern Ontario

Type: Migrant waterfowl use during spring and fall.

Location: Primarily southern Great Lakes; some data available for northern Great Lakes; good but old data available for James and Hudson Bay Shoreline.

Temporal Extent: 1971- present. Large survey done in batches periodically (every 10 years), done three so far.

Georeferenced: at low resolution.

Habitat information: Not collected.

Method: Periodic (decadal) fixed-wing surveys of migrant waterfowl use of shoreline sectors; all waterfowl visible in the near-shore area counted; intensive biweekly surveys throughout spring and fall migration periods are carried out every ten years approximately along the southern Great Lakes shore

Target Species: all migrating waterfowl close to shore; best for divers.

Agency: CWS, LPWWRP

Annual Monitoring of Lower Great Lakes Canvasbacks

Type: staging survey (first week of November).

Location: Lower Great Lakes

Temporal Extent: mid-1970s to present (ongoing)

Georeferenced: at low resolution.

Habitat information: No.

Method: Fixed-wing surveys of canvasback use of shoreline sectors conducted in November.

Target Species: Canvasback

Agency: CWS, LPWWRP

Annual Mid-winter survey

Type: Winter survey.

Location: Lower Great Lakes

Temporal Extent: mid-1970s to present (ongoing) (became annual survey in the mid-1980s)

Georeferenced: Georeferenced at low resolution- observations done in sectors which are georeferenced

Habitat information: No.

Method: Annual fixed-wing surveys of waterfowl use of shoreline and offshore sectors conducted in January over a 3-5 day period (co-ordinated with the Mississippi Flyway mid-winter survey; typically

during the first full week in January; annual ground surveys are also conducted by OMNR and naturalist clubs).

Target Species: All waterfowl found along shorelines (better for divers than dabblers & geese)

Agency: CWS, OMNR, LPWWRF, some naturalist clubs

Ontario Shorebird Survey

Type: Migrant shorebird population trend and habitat use during spring and fall.

Location: Primarily southern Ontario.

Temporal Extent: 1978- present

Georeferenced: Yes

Habitat information: Some

Method: Annual counts by volunteers throughout the migration periods of selected areas known to be used by migrant shorebirds; counts usually biweekly; approximately 10 volunteer active per year.

Target Species: All shorebirds.

Agency: CWS

Spring Population Surveys of Snow Geese

Type: Breeding Snow Goose (mid continental population).

Location: Hudson Bay Lowlands.

Temporal Extent: 1996- present (ongoing)

Georeferenced: Yes

Habitat information: not collected

Method: helicopter surveys of systematically located transects during mid incubation. Cape Henrietta-Maria colony survey conducted annually or biannually. Three other colonies surveyed once every ten years.

Target Species: Snow Geese. Useful data also gathered on Canada geese and eiders

Agency: OMNR, CWS

The following surveys contribute information on waterfowl populations to OEJV; however, they are conducted as part of a program that is not associated with OEJV (the Long Range Transport of Atmospheric Pollutants). Funding comes from Environment Canada.

LRTAP (Acid Rain) Biomonitoring Surveys

Type: Breeding Pair and Brood (waterfowl).

Location: Main study areas in Algoma, Sudbury, Muskoka, and Haliburton Districts with baseline surveys in NW Ontario (Experimental Lakes Area)

Temporal Extent: 1988-present (ongoing)

Georeferenced: Yes

Habitat information: Yes- Collected

Methods: Spring helicopter surveys during nest initiation, and summer brood surveys; individual wetland based (over 160 per area); each study area has been surveyed at least two out of every three years since 1988.

Target Species: All waterfowl, Common Loons, other large waterbirds

Northern Ontario Waterfowl Breeding Pair Survey

Essentially completed, currently some plots continue as part of LRTAP

Type: Breeding Pair (waterfowl).

Location: Northern Ontario.

Temporal Extent: 1980 and 1988. Some blocks were surveyed more recently but not systematically

Georeferenced: in the process of being georeferenced.

Habitat information: Yes- Collected

Method: Spring helicopter surveys during nest initiation; 2x2km plots in systematic (UTM based) groups of 25 spaced throughout northern Ontario.

Mostly single coverage during the 80s but provides a framework for repeat surveys to assess population changes.

Target Species: All waterfowl.

Banding Programs:

Banding of Temperate Nesting Canada Geese

Location: southern Ontario

Temporal Extent: 1990-present (on-going)

Georeferenced: Yes

Habitat information:

Method: conducted annually (about 4000 birds are banded each year), includes both urban and rural populations

Target Species: Canada geese

Agency: CWS

Northern Canada Geese Banding Program

Location: Hudson and James Bay coastlines

Temporal Extent: 1974-present

Georeferenced: yes

Habitat information: no

Method: helicopter supported banding of brood flocks along coast

Target Species: Canada geese (southern James Bay and Mississippi Valley populations)

Agency: OMNR, Flyway Councils

Northern Snow Goose Banding

Location: Hudson and James Bay coastlines

Temporal Extent: 1960-1969 and 1995-present (ongoing)

Georeferenced: yes

Habitat information: no

Method: helicopter supported banding of brood flocks along the Hudson and James Bay coasts

Target Species: snow geese (southern James Bay and Mississippi Valley populations); Ross's geese

Agency: OMNR, Flyway Councils

Pre-season Duck Banding Program

Type: pre-season waterfowl (all duck species)

Location: southern central and northeastern Ontario

Temporal Extent: 1985-present (ongoing) (some predate back to the 1970s)

Georeferenced: yes

Habitat information: no

Method: bait trapping (since 1970s) and airboat night lighting (started in 1993-present)

Target Species: focus on black ducks and mallards; also provides useful information on wood ducks, ring-necked ducks and all other eastern waterfowl

Agency: OMNR, Flyway Councils, CWS

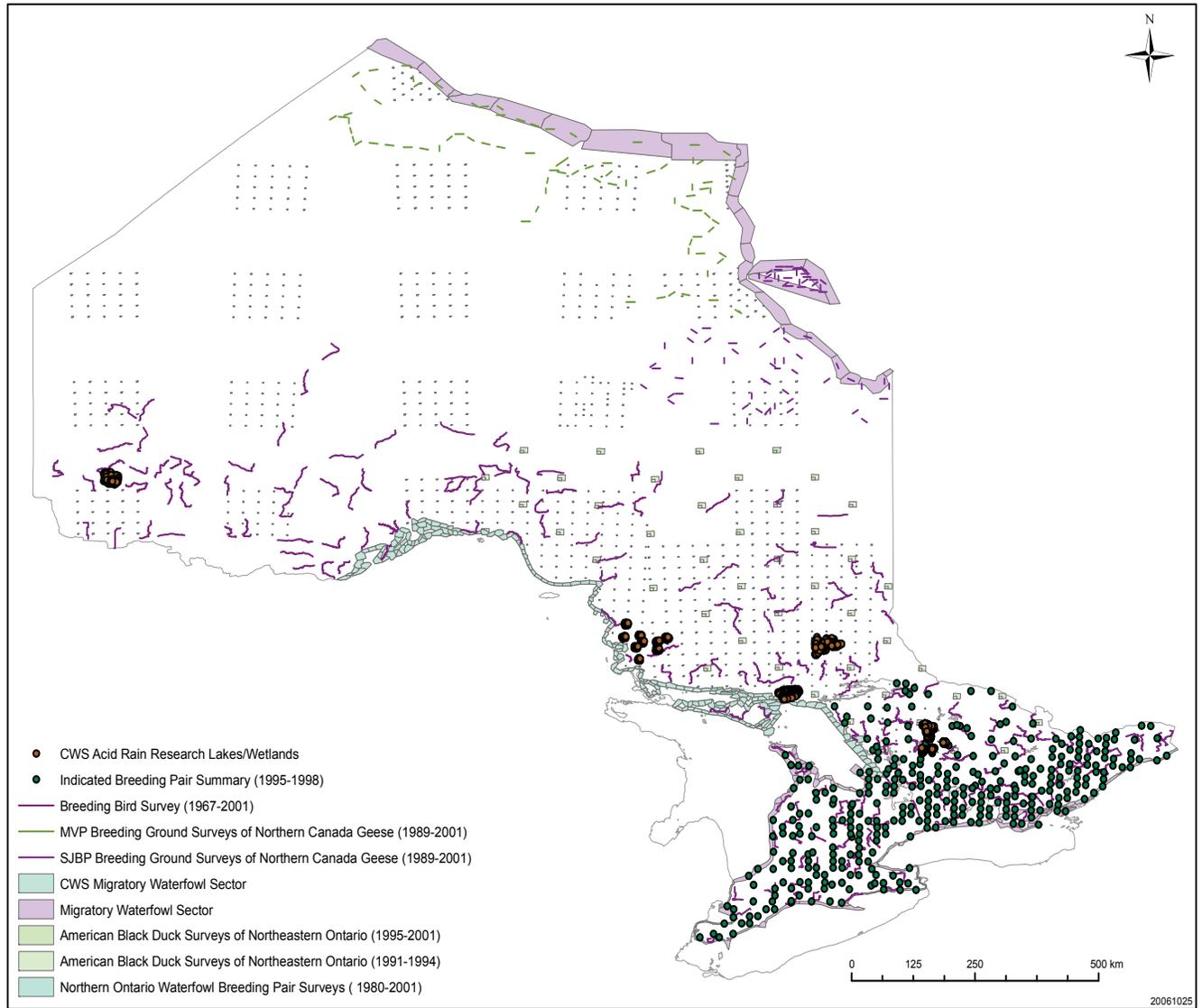


Figure 7: CWS Surveys in Ontario

Appendix 8: Limiting Factors and Conservation Needs for Key Waterfowl Species

Priority Waterfowl Species	Season	Limiting Factors	Habitat Needs	Information/Science Needs & Gaps
Wood duck	Breeding	1. Natural nesting cavity availability may be limiting in some landscapes.	1. Increase the availability of cavity nesting sites through efforts such as forest management planning and supplementary nest box programs.	Need improved understanding of where natural nesting cavities are limiting. Improved understanding of the impact of existing forest management techniques on the availability of beaver food resources.
		2. Wetland abundance and productivity.	2. Breeding wood duck density is dependent upon abundance of productive wetland habitat which in turn is determined in some landscapes by beaver populations.	
American black duck	Breeding	1. Interspecific competition with mallards in agricultural landscapes.	1. Competition for productive wetland habitat and restored habitat favours mallard pairs over black ducks in overlapping niches.	Need to develop a waterfowl productivity model that links habitat variables and waterfowl breeding pairs and allows for a habitat response model to be developed similar to the Prairie Habitat Joint Venture (PHJV). Need to determine the factors that are responsible for current stable breeding population. Need to understand habitat use in areas with anthropogenic influences such as agricultural and coastal habitats. Research to improve understanding of relationship between habitat variables and hen body condition, nest success and hen success.
		2. Hen productivity.	2. Securement of existing habitat base is a priority especially in forested landscapes - this may be accomplished in part through participation in forest management planning.	
		3. Hen breeding condition.	3. High quality foraging sites are required in spring to build exogenous body reserves to support enhanced hen fecundity.	
	Staging	1. Poor spring hen body condition.	1. Need to enhance spring season foraging habitats to promote improved body condition.	
	Wintering	None for Ontario	None for Ontario	None for Ontario

Priority Waterfowl Species	Season	Limiting Factors	Habitat Needs	Information/Science Needs & Gaps
Mallard	Breeding	1. Pair settlement.	1. Increase the availability of small ephemeral/seasonal wetlands that function as pair habitat focusing on areas with existing brood habitat.	Need to develop a waterfowl productivity model that links habitat variables and waterfowl breeding pairs and allows for a habitat response model to be developed similar to the PHJV. Need improved understanding of mallard ecology in forested landscapes.
		2. Duckling survival.	2. Increase availability of productive brood habitat.	
		3. Nest success	3. Increase availability of suitable upland nesting situated in close proximity to brood habitat.	
	Staging	1. Harvest mortality.	1. Not habitat linked.	Need improved understanding of the availability of wetland and upland food resources in the spring staging period.
		2. Non-breeding survival.	2. Fall agricultural feeding opportunities not limiting but spring wetland and upland food resources may be limited in some areas.	
	Wintering	None for Ontario.	None for Ontario.	None for Ontario.
Northern pintail	Breeding	1. Unknown.	1. Unknown.	Improved understanding of basic breeding ecology and habitat relationships. Increased survey and banding efforts may enhance understanding.
	Staging	1. Unknown.	1. Fall agricultural feeding opportunities likely not limiting but spring wetland and upland food resources may be limited in some areas.	Improved understanding of staging needs.
Blue-winged teal	Breeding	1. Suitable pair habitat thought to be limiting.	1. Availability of shallow seasonal and semi-permanent wetland habitat.	Need improved understanding of basic breeding ecology and habitat relationships to understand population declines and develop appropriate conservation programs.
			2. Wetland and upland habitat associated with pastureland.	
Canvasback	Staging	1. Disturbance such as recreational boat traffic that limits availability of food resources.	1. Undisturbed foraging sites.	Expanded fall staging surveys to provide more complete spatial coverage on lower Great Lakes and potentially other staging areas.

Priority Waterfowl Species	Season	Limiting Factors	Habitat Needs	Information/Science Needs & Gaps
Lesser scaup	Staging	1. Contaminants that may impact hen body condition/fecundity (potentially selenium in zebra mussels).	1. Foraging sites that provide food resources that are not contaminated.	Improved understanding of the impact of selenium and other contaminants on scaup. Expanded fall staging surveys to provide more complete spatial coverage on lower Great Lakes and potentially other staging areas.
		2. Disturbance such as recreational boat traffic that limits availability of food resources. Same as above.	2. Undisturbed foraging sites. Same as above.	
Greater scaup	Wintering			Winter surveys need to be expanded in both duration and geographical extent.
		Same as for lesser scaup above.		
Ring-necked duck	Breeding	1. Limiting factors unknown.	1. Habitat is not known to be a limiting factor	Improved understanding of basic breeding ecology and habitat relationships. Increased banding efforts may enhance understanding.
	Staging	1. Limiting factors unknown.	1. Staging habitat is not known to be a limiting factor.	Improved understanding of staging needs. Expanded staging surveys.
Long-tailed duck	Wintering	1. Contaminants that impact hen body condition/fecundity (potentially selenium in zebra mussels).	1. Foraging sites that provide food resources that are not contaminated.	Improved understanding of the impact of selenium and other contaminants on long-tailed ducks. Need to develop and implement long-tailed duck surveys on lower Great Lakes. Improved understanding of habitat needs for this species.
		2. Disturbance such as recreational boat traffic that limits availability of food resources.	2. Undisturbed foraging sites.	
Common goldeneye	Breeding	1. Natural nesting cavity availability may be limiting in some landscapes.	1. Increase the availability of cavity nesting sites through efforts such as forest management planning and supplementary nest box programs.	Need improved understanding of where natural nesting cavities are limiting. Improved understanding of potential breeding habitat limitations (e.g. acid rain, human disturbance/development).

Priority Waterfowl Species	Season	Limiting Factors	Habitat Needs	Information/Science Needs & Gaps
Hooded merganser	Breeding	1. Natural nesting cavity availability may be limiting in some landscapes.	1. Increase the availability of cavity nesting sites through efforts such as forest management planning and supplementary nest box programs.	Need improved understanding of where natural nesting cavities are limiting. Monitoring of harvest rates.
		2. Wetland abundance.	2. Breeding pair density is dependent upon abundance of wetland habitat which in turn is determined in some landscapes by beaver populations.	Improved understanding of the impact of existing forest management techniques on the availability of beaver food resources.
Black scoter	Staging	1. Quality and abundance of staging and moulting sites may be limiting.	1. Unknown.	Increased understanding of black scoter staging and moulting needs and habitat limitations. Data are needed on basic population dynamics and ecology for this species.
Canada Goose- Temperate nesting giants	All	None.	None.	Develop population control measures that are socially acceptable. Improved understanding of interspecific competition for breeding habitat with other waterfowl.
Canada Goose - Southern James Bay (SBJ)	Breeding	1. Nest success - weather effects.	1. Not a habitat issue.	Assess impacts (magnitude and population effect) of spring aboriginal harvest. Comparative information on aboriginal harvest impacts on SJB, temperate nesting giants and Mississippi Valley Populations.
		2. Gosling survival - weather effects.	2. Not a habitat issue.	Improved understanding of the impact of moult migrant Canada geese on MVP gosling survival due to competition for food resources.
Canada Goose- Mississippi Valley Population (MVP)	Breeding	1. Adult survival due to harvest.	1a. Secure undisturbed roosting areas. 1b. Access to agricultural fields for foraging.	General need for information on bioenergetics on the various staging grounds utilized during migration.
		1. Nest success - weather effects.	1. Not a habitat issue.	
		2. Gosling survival - weather effects.	2. Not a habitat issue.	Assess impacts (magnitude and population effect) of spring aboriginal harvest.

Priority Waterfowl Species	Season	Limiting Factors	Habitat Needs	Information/Science Needs & Gaps
Atlantic brant	Staging	1. Spring pre-breeding body condition.	1. The protection of the HBLD migratory staging areas.	Improved understanding of the staging habitat needs of this species both on the HBLD and elsewhere in the migration corridor to the Atlantic.
Tundra Swan - Eastern population	Staging	1. Spring pre-breeding body condition.	1. Availability of waste agricultural grains and associated sheet water habitat in the spring. 2. Availability of undisturbed staging wetlands in the fall.	Improved understanding of the link between pre-breeding body condition and reproductive rates.

Appendix 9: Predicting Waterfowl Outcomes for the OEHJV Program

A) Existing Waterfowl Studies.

Wetland Type	IBP / hectares
1. small marsh	2.5 +/- 0.4
2. larger marsh	1.0 +/- 0.3
3. swamp	2.5 +/- 0.8
Overall	2.0 +/- 0.3

Measuring the predicted waterfowl outcome resulting from the implementation of conservation programs is of value in both determining program benefits and analyzing the progress towards waterfowl goals. Predicted waterfowl outcomes were based on the best available information; sources included:

- 1) Ontario Waterfowl Production Study. DUC 1980.
- 2) Webster Waterfowl Study. DUC 1999.
- 3) Mallard Ecology Study. DUC 1999-2003.
- 4) CWS Southern Ontario Breeding Waterfowl Survey. 1971– present.

The details of the information provided by each of the above sources is outlined below:

- 1) Ontario Waterfowl Production Study. DUC 1980.
This study evaluated both pair and brood use on 12 selected DUC wetland restoration projects. The 12 projects were assigned a wetland type based on habitat characteristics. The study included all waterfowl species.
- 2) Webster Waterfowl Study. DUC 1999.
The adaptive management study was undertaken for one season to evaluate the waterfowl productivity in various wetland management treatment types on the same landscape and compare these to adjacent reference or control wetlands. The study included both ducks and geese. The lack of pairs on excavated wetland treatments was hypothesized to be a result of the lack of adequate time for the ponds to naturalize following construction.

Wetland Treatment	IBP / hectare
1. impoundment	4.6
2. excavation	0.0
3. control (no management.)	2.4

- 3) Mallard Ecology Study (MES). DUC 1999-2003.
The MES evaluated waterfowl vital rates on four different study sites across southern Ontario. Pair surveys were rigorously designed road transects and these were conducted at optimal points in the breeding season. Surveys were compiled on a square kilometre basis rather than on a wetland basis.

Study Site	Wetlands per square kilometre	IBP per square kilometre	Estimated wetland size (hectare)	Estimated IBP/ hectare
Cambridge				
A) High Wetland Density	8	6.4 +/- 0.1	2.0	0.4
B) Low Wetland Density	1.6	1.2 +/- 0.1	2.0	0.4
Portland	2.7	1.9 +/- 0.1	4.0	0.2
Bolton				
London				

- 4) CWS Southern Ontario Breeding Waterfowl Survey. 1995 and 1998 data.
This data comes from the CWS southern Ontario half mile ground survey plots. Two years of data were summarized and used to create the table below. Plots are randomly stratified across southern Ontario and are representative of wetlands and habitats across BCR 13 and a small southern portion of BCR 12.

Total Number of Wetlands for all plots	836
Wetland Area (Hectares)	2387.4
Total Breeding Pairs Averaged Between Years	764.5
Breeding Pairs / Wetland	0.9
Breeding Pairs / Wetland Area (Hectare)	0.3
Breeding Pairs / square kilometre	3.4

B) Predicted Waterfowl Outcomes

- 1) Secured Wetland and those influenced by Stewardship
For wetlands that have been directly secured or protected by provincial policies and no subsequent management activities are to be implemented, the CWS Southern Ontario Breeding Waterfowl Survey and the MES study plots provide the best estimate of waterfowl pair values. CWS found an average of 0.3 IBPs/ wetland hectare across all plots in the two years sampled. MES IBP / wetland hectare ranged from 0.2 to 0.4 in the Portland and Cambridge study sites respectively. The Webster Waterfowl Study also included pair surveys on unmanaged wetlands, but a significantly higher 2.4 IBPs / wetland hectare may be a reflection of the study site and/or the close proximity of adjacent restored basins. An estimate of 0.3 IBPs / wetland hectare seems appropriate for secured wetlands across Ontario.
- 2) Restored Wetlands
For wetlands that have been enhanced or restored directly or through extension efforts, the Ontario Waterfowl Production Study and the Webster Waterfowl Study both provide insight into the predicted IBP value of these types of habitats. The more recent Webster Waterfowl Production Study is more reflective of the value of smaller restored or enhanced wetland basins while the older Ontario Waterfowl Production Study effectively evaluated wetland productivity based on wetland size and type. An average for the typical small wetland program that is currently being delivered to address pair habitat limitations from both these studies would predict a value of 3.6 IBPs / wetland hectare.

C) OEJV Waterfowl Outcomes

Table 3 in the OEJV IP provides partner habitat goals for a five-year period. Predicting the waterfowl response of the various conservation programs can be predicted with the information supplied above.

Program Activity	Wetland Acres (Hectares) over Five Years	Predicted Waterfowl Response (IBP/hectare)	Total Predicted Waterfowl (IBP)
Habitat Securement	3,225 (1,305)	0.3	392
Habitat Enhancement	2,550 (1,032)	3.6	3,715
Habitat Management	191,000 (77,298)	3.6	278,273
Stewardship (Extension / Influence)	5,700/494,300 (2,307 / 200,040)	3.6 / 0.3	8,305/60,012
Total	N/A		350,697

Appendix 10: Conservation Actions for Ontario Shorebirds and Landbirds

The following actions were extracted from *Ontario Shorebird Conservation Plan* (2003) and the *DRAFT Ontario Landbird Conservation Plan- BCR 13 Great Lakes/ St. Lawrence Plain* (2007)

SHOREBIRD SCIENCE NEEDS

POPULATION AND DISTRIBUTION CHARACTERISTICS

Breeding Shorebirds

Science needs with respect to numbers and distribution of breeding shorebirds in Ontario are:

1. To determine breeding distributions and develop accurate estimates of population size and trend. Much of northern Ontario is without road access and the number of places that fixed-wing aircraft can land is limited, making access difficult and costly. As a result, there has not been an accurate assessment of the population size or the full extent of the ranges of shorebirds that breed in this area. Such information is crucial in assessing a species' conservation priority. Development of the methodologies to do this forms a major component of PRISM, and will involve cooperation among many agencies, including those outside of Ontario.

(High Priority)

Species priorities are assigned as follows:

A. Species known to have relatively low population levels with potentially high proportions of their populations or isolated sub-populations breeding in Ontario.

The Hudsonian Godwit, which has in the past been considered rare in Ontario, may have as much as one quarter of its Canadian breeding range in the province making it of high regional conservation importance. The size of the isolated James Bay Marbled Godwit population is also unknown, but appears to be relatively small. Questions need to be addressed regarding why it is not more numerous, its taxonomic status, and its winter distribution. **(High Priority – BCR 7)**

B. Southern breeding species that are subject to greater anthropogenic impacts. While southern breeding shorebirds were often encouraged initially by human-induced changes, they are now facing potentially serious declines as land uses change with further human population expansion. Related pressures enhance the need for continual monitoring to identify threats in this part of the province. At the same time, the large population and the accessibility of the area offer the greatest potential for volunteer-based surveys, which could greatly improve our knowledge of shorebird populations. As none of the six species that nest widely in southern Ontario do so exclusively there, surveys and monitoring in southern Ontario must be coordinated as much as possible with those in the northern part of the province, to assess relative changes and overall numbers. Priority species in this group include the American Woodcock and the Upland Sandpiper, both of which appear to be declining in abundance. **(High Priority – BCR 12, 13)**

C. Species known to have a significant proportion of their breeding populations in Ontario.

The Hudson Bay Lowlands in particular and, to a lesser extent, the boreal forest areas across the province provide for a large proportion of the Canadian populations of Greater Yellowlegs, Lesser Yellowlegs, and Solitary Sandpiper. There are no estimates of population size as these species are widely dispersed in inaccessible areas during the nesting season, particularly the yellowlegs, and there is little information on the extent of occupation within the province. The Solitary Sandpiper does not congregate anywhere in large numbers, and breeding density estimates may be best gathered during other operational surveys (e.g., annual breeding waterfowl counts and the Ontario Breeding Bird Atlas 2001-2005). **(Medium Priority – BCR 7, 8, 12)**

D. Arctic-breeding species with substantial but undetermined parts of their breeding range in the province.

The ranges of several Arctic-nesting shorebirds extend into Ontario and significant numbers of Semipalmated Plover, Semipalmated Sandpiper, Dunlin, Stilt Sandpiper, and Red-necked Phalarope may breed here. However, there are no adequate estimates of the numbers of these species in the province, or the importance of this segment of the population to the overall Canadian population. **(Medium Priority – BCR 7)**

E. Secretive species likely with low abundance. The Hudson Bay Lowlands of Ontario lie between the two nesting areas of separate subspecies populations of Short-billed Dowitcher. Until fairly recently, it was not even recognized as a breeding bird here, and is surmised to be very rare. A difficult species to find and study, its status in the province might be quite underestimated. **(Medium Priority – BCR 7)**

F. Other shorebird species nesting in northern Ontario. There is a need for better understanding of overall population sizes and ranges for most species in order to assess their conservation priority in the province. **(Medium Priority – BCR 7, 8)**

2. To monitor population trends of species sampled during various spring surveys, either volunteer or agency-based. Priority should be given to analyzing these data and improving the surveys where possible. Surveys would include the Breeding Bird Survey, Forest Bird Monitoring Program, Marsh Monitoring Program, Black Duck Survey, and Spring Woodcock Survey. **(High Priority – BCR 8, 12, 13)**

3. To examine population dynamics in order to identify and monitor indices of production and mortality for those species whose populations are known to be declining significantly. There is presently little or no information on reproductive output, fledging success, or age-specific mortality for any populations of shorebirds breeding in Ontario. Therefore, it is not possible to determine if breeding factors are currently affecting those populations of concern. This information could be very important in the development and assessment of management programs. **(High Priority – BCR 7, 8, 12, 13)**

4. To undertake colour marking or telemetry studies to determine migration routes and wintering grounds of certain northern Ontario breeding species, such as the godwits and the yellowlegs. Migratory pathways followed by some species of shorebirds that nest in northern Ontario, and the areas where they stage and overwinter are largely unknown. Thus, it is not possible to assess the potential causes of declines that may result from factors outside the breeding range. **(Medium Priority – BCR 7)**

5. To document more completely the annual variation in numbers and distribution of the endangered Piping Plover. The Piping Plover may still breed in Ontario at least occasionally in two known locations in Lake of the Woods. As part of the recovery plan for this species, a search of all possible nesting areas will be conducted and monitoring of its occurrence will continue (Goossen et al. 2002). **(High Priority – BCR 12, 13)**

6. To identify areas with highest breeding densities of certain species. Priority should go to species with the largest proportion of their ranges in southern Ontario and facing the greatest probability of decline (Upland Sandpiper, American Woodcock) due to anthropogenic impacts. Identifying the areas of highest breeding potential provides crucial information on habitat relationships, and helps to identify priority locations for conservation action. **(High Priority – BCR 13)**

Migrating Shorebirds

Science needs with respect to numbers and distribution of migrating shorebirds in Ontario are:

1. To assess fully the importance of the Hudson and James Bay coasts to migrating shorebirds in both spring and autumn. Although the northern coasts are very important migration areas for shorebirds transiting between the Arctic and wintering areas in Central and South America, previous surveys have provided incomplete estimates of their use because of difficulties in covering the full coasts or in surveying at optimal times. There is a need for much better information on the numbers and distributions of each of the major migrant species using the north coasts to focus conservation action and to contribute to assessing population sizes and trends for these birds in a global perspective. **(High Priority)**

Specific information needs in order of priority are as follows:

A. To determine peak numbers and distributions of the major staging species using the coasts by means of dedicated aerial surveys. Such work, which could employ digital counting techniques, should focus initially on the autumn period when higher numbers are anticipated and staging is more protracted. These surveys may contribute to population monitoring of high priority species including Hudsonian Godwit, Marbled Godwit, and Red Knot. **(High Priority – BCR 7)**

B. To estimate the total numbers of shorebirds using the coasts by studying turnover rates of the major staging species. This work would require use of marking or radio telemetry techniques along with routine banding, and would necessitate the establishment of field stations in areas of high shorebird staging concentration. **(Medium Priority – BCR 7)**

C. To determine the sex, age class, linear dimensions, and weight of birds present at various times and relate these to turnover rates. This information will provide useful means of monitoring species productivity and staging habitat quality, as well as providing information on subspecies. Some of this can be undertaken through reanalysis of older data sets using more modern statistical techniques. **(Medium Priority – BCR 7)**

2. To assess the importance of southern Ontario to migrating shorebirds by determining shorebird use of a statistical sample of appropriate habitats throughout the area during peak migration, and applying these usage levels to estimates of the total amounts of the various habitat types. Shorebirds migrating through southern Ontario use a wide variety of different habitats, in a multitude of different places. The importance of the various habitat types is not understood, nor is the aggregated impact of these as potentially useful migratory stop-overs that may be available, even briefly or irregularly. This information would help determine the emphasis in conservation actions, whether broad-based or site specific. Such work might be undertaken in cooperation with the Ontario Breeding Bird Atlas project; some volunteers could survey shorebird use outside of the breeding bird survey time period on their assigned plots. **(High Priority – BCR 13)**

3. To assess the impact of the harvest of shorebirds on population trend. The National Harvest Survey for American Woodcock and Common Snipe should be maintained. The influence of native harvest on the Marbled Godwit population should also be examined. **(High Priority – BCR 12, 13)**

4. To improve the monitoring of shorebird migration with more frequent and widespread assessment of numbers through expansion of the Ontario Shorebird Survey. This and related surveys throughout North America and the Caribbean provide the only coordinated means of monitoring population trends of a wide range of shorebird species. Ontario provides an important contribution as it is one of the few inland areas monitoring shorebird migration. **(High Priority – BCR 12, 13)**

5. To determine the degree of repeat use by shorebirds of particular areas in southern Ontario to establish whether they are traditional stop-over sites used by specific individuals, or are used on a more random and opportunistic basis by migrants. This information would also help direct habitat management strategies. **(Medium Priority – BCR 13)**

6. To establish the breeding origins and wintering destinations of staging shorebirds through a variety of marking and analysis techniques. There is limited information on migratory pathways followed or specific wintering areas occupied in order to evaluate potential causes of decline operating outside the breeding range. Such information is also useful in fostering partnerships in conservation. **(Medium Priority – BCR 7)**

HABITAT RELATIONSHIPS

Breeding Shorebirds

Science needs with respect to habitat relationships of shorebird species breeding in Ontario are:

1. To determine precise breeding habitat associations and identify those features crucial to shorebird populations. For most species of breeding shorebirds, only a general idea of the habitats chosen by each is known. **(High Priority – BCR 7, 13)**

2. To determine present and potential threats to breeding habitats and assess the likely effects in the short and long term. Emphasis should be placed on existing threats, such as goose overabundance, urbanization, agricultural and

forestry practices, and the presence of toxic substances. This work will require cooperation throughout the hemisphere to be effective. **(High Priority – BCR 7, 8, 12, 13)**

3. To identify all appropriate breeding habitat remaining for Piping Plovers in Ontario. This information is necessary in case recovery techniques such as re-introduction are to be considered. **(High Priority – BCR 12, 13)**

Migrating Shorebirds

Science needs with respect to habitat relationships of shorebird species migrating in Ontario are:

1. To determine the importance of specific James and Hudson Bay shoreline habitats through studies of temporal and spatial variation in invertebrate resources in response to salinity and substrate. The inflow of fresh water from the many rivers has important influences on the salinity of waters near river mouths, and this in turn affects invertebrate populations. Silt loads carried by major rivers and distributed by currents along the shores of the bay also have an impact on invertebrate populations. An understanding of the patterns and effects of the river inflow is necessary to evaluate the influence of potential changes in those patterns on shorebird staging (e.g., through possible hydro-electric developments). **(High Priority – BCR 7)**

2. To examine the present and potential threats to the carrying capacity of the James and Hudson Bay coastal zone caused by goose overabundance. Very high Lesser Snow Goose numbers have caused major disturbances in sediments and marshes along the bay shores. How these activities might be affecting invertebrate populations is largely unknown. The short-term and long-term consequences of such disturbance needs to be assessed in conjunction with other influences like isostatic uplift and climate change. **(High Priority – BCR 7)**

3. To determine the available food resources in various types of habitats to assess their potential value to migrating shorebirds. It is not known if stopover sites in southern Ontario are important to providing fat reserves for long migratory flights, or if birds are merely maintaining their weight prior to making short flights. In conjunction with determining the rate of passage of shorebirds, there is a need to estimate the food reserves present, the use made of those reserves, and the importance of small habitat patches to the energy needs of migrant shorebirds. The role and contribution of sewage lagoons as habitat for migrating shorebirds should be more thoroughly assessed. **(High Priority – BCR 13)**

4. To examine the possible effects of environmental toxins on migrating shorebirds. Some of the migrating shorebirds stopping in southern Ontario are feeding in polluted or potentially polluted waters and sediments. The impact of contaminants on shorebirds has never been thoroughly investigated in Canada (Noble 1991). **(High Priority – BCR 13)**

5. To examine the effects of habitat loss on migrant shorebirds in southern Ontario, as a result of a variety of identified stressors. It is unknown if shorebirds have suffered significant habitat losses in southern Ontario that may be influencing population levels, or if there is more habitat still available than required for the numbers of migrants that use the area. Could migrant shorebird populations be enhanced if more habitat was available in southern Ontario? **(Medium Priority – BCR 13)**

6. To determine the use of invertebrate resources by shorebirds through detailed feeding studies along the James and Hudson Bay shores. Although there have been some studies of the invertebrate resources of northern coastal areas, more extensive work is needed to establish more specific links to the distributions and feeding habits of shorebirds; moreover there is the opportunity to examine long-term temporal changes through comparisons with the earlier work. Dynamics of shorebird distribution on the bays must be examined in light of seasonal and annual variations in availability and distribution of invertebrates in various habitats. **(Medium Priority – BCR 7)**

7. To assess the potential impact of sea level rise on habitat availability for migrant shorebirds along the James Bay and Hudson Bay coasts, taking into account the influence of isostatic rebound. This would be a modeling exercise approached through the analysis of long-term remote sensing databases. **(Medium Priority – BCR 7)**

Conservation and management needs for breeding and migrating shorebirds in Ontario are:

1. To develop an inventory of sites used by migrating shorebirds in southern Ontario. Emphasis should be placed on the most frequently and heavily used habitats. This work should be linked to WHSRN and the IBA program. **(High Priority – BCR 13)**
2. To determine appropriate conservation actions to respond to identified existing and potential threats to habitats. Priority should be assigned to the most imminent and serious threats, to areas with high diversity of shorebirds, and to areas with the highest concentrations of species of concern. An important component of these approaches should involve landowner participation in which stewardship agreements are developed with landowners to protect significant shorebird habitat, and to enhance food resources for migrating shorebirds. **(High Priority – BCR 12, 13)**
3. To contribute to government land use policies, and to policy development of all major land-user groups where possible, to encourage shorebird conservation. Policies pertaining to wetland conservation and restoration, water quality and quantity, and agricultural practices should be targeted and should include conservation guidelines for small wetlands currently not viewed as provincially significant. **(High Priority – BCR 7, 8, 12, 13)**
4. To contribute to government resource development policies and regulations, especially to timber harvest management plans as they may affect shorebirds nesting in wooded areas, particularly boreal forest wetlands. **(High Priority – BCR 8, 12)**
5. To participate in the development and implementation of recovery plans for shorebird species at risk, such as Piping Plover. **(High Priority – BCR 12, 13)**
6. To contribute shorebird conservation components to management plans of provincial and national parks, national wildlife areas, and various other wildlife reserves. Such a contribution is particularly important to the plans for Polar Bear and Presqu'île Provincial Parks. Similarly, shorebird conservation should be considered where appropriate in management plans by non-government organizations for wetlands on private property. **(High Priority – BCR 7, 8, 12, 13)**
7. To formally protect important areas for both breeding and migrating shorebirds through inclusion in reserves and parks and, where this is not immediately possible, to encourage protection and conservation of these areas through designation under programs such as the WHSRN, IBAs, heritage coastlines, and other possible allocations. Highest priority for action goes to the James and Hudson Bay coasts where a relatively narrow strip of coast with intertidal mudflats and marshes, and adjacent open marshes, ponds and ridges, provide a crucial link in the annual cycle of migrant shorebirds; providing full protection by annexing these shorelines to Polar Bear Provincial Park should be considered. Important sites having lower priority have been identified in southern Ontario where other means of securement/stewardship may be more effective; these would include private conservation acquisitions, conservation easements, community conservation plans (e.g., IBAs), and stewardship agreements. Present focus should be on unprotected wetlands associated with the southern Great Lakes shoreline, and on the Point Pelee onion fields and St. Clair Flats. **(High Priority – BCR 7, 13)**
8. To undertake experimental habitat management activities to find cost-effective techniques to enhance foraging opportunities for migrating shorebirds. As much as possible, these techniques should be optimized with those for other species groups such as waterfowl and marsh birds, and should follow an adaptive management approach. Experimental management should also be conducted in an assessment framework so that real incremental benefits can be separated from apparent benefits (e.g., redistribution). **(High Priority – BCR 13)**
9. To monitor hunting pressure on American Woodcock and Common Snipe, and relate harvest to abundance, population size and trend, and habitat availability; make regulation changes if required. **(High Priority – BCR 12, 13)**
10. To develop educational initiatives to increase public awareness of shorebirds and the potential influences of human activities on shorebird numbers and habitats. A priority would be the development of a shorebird component to the Hudson Bay Lowlands environmental studies curriculum developed with First Nations through the EHJV. This could take place as part of the Shorebirds Sister Schools program (U.S. Fish and Wildlife Service). **(Medium Priority – BCR 13)**

BCR 13 Landbird Conservation Actions

Recommended Conservation Actions for Forest Landbirds

Monitoring

- Maintain monitoring efforts for endangered and threatened forest landbirds including Acadian Flycatcher, Hooded Warbler, and Prothonotary Warbler.
- Develop more standardized surveys to assess population abundance, distribution and trends for Cerulean Warbler and Louisiana Waterthrush.
- Evaluate suitability of other existing breeding season surveys (Red-shouldered Hawk and Spring Woodpecker survey, Forest Bird Monitoring Program, Nocturnal Owl Survey) for monitoring forest species that are not well monitored by BBS (especially forest interior species).
- Develop and maintain a system for mapping and tracking the distribution and condition of forest habitats in southern Ontario.

Research and Evaluation

- Promote demographic and habitat research to identify cause(s) of the observed or apparent declines in Canada Warbler, Cerulean Warbler, Eastern Wood-Pewee, Northern Flicker, Red-headed Woodpecker, and Whip-poor-will.
- Promote research to increase understanding of the effects of forest condition (size, structure, composition, health), forest management practices, and landscape variables (proximity for forests, regional forest cover) on the abundance, distribution and demographics of priority forest birds (expand on current research by OMNR in southwestern Ontario).
- Identify species whose populations are likely to be limited during the non-breeding season.

Planning and Policy

- Encourage municipalities to identify and protect Significant Woodlands and other important forested natural areas in Official Plan documents in keeping with existing guidelines OMNR 1999, OMNR 2000, Ontario Nature 2004).
- Encourage municipalities to develop and enforce appropriate tree-cutting bylaws that retain large trees and snags (where not a safety hazard) across the landscape.
- Restrict residential development in and adjacent to forests and natural areas.
- Review provincial policies related to the protection of trees with unoccupied stick nests.
- Update provincial planning guides to consider the needs of PIF priority landbirds.

Outreach and Education

- Promote the development and use of updated forest management guidelines (site, stand and landscape scales) and/or silvicultural guides (OMNR 2000, OMNR 2004) appropriate for the protection of priority forest birds by public and private forest managers in southern Ontario (i.e., update existing OMNR habitat guidelines such as James 1984a and 1984b, incorporate other BMP documents such as Rosenberg et al. 1999 and 2003, incorporate results of research projects such as Holmes et al. 2003).
- Promote the development of relevant educational materials for woodlot owners.
- Work to change public perceptions about the value of leaving standing dead trees and limbs (where not a safety hazard).
- Work with partners in the United States and Latin America to protect priority forest landbirds during migration and on wintering grounds, making use of NABCI and PIF initiatives.

Applied Conservation

- Implement conservation actions outlined in the Recovery Strategies for Acadian Flycatcher, Hooded Warbler, and Prothonotary Warbler.

- Implement proposed habitat enhancement or management actions for declining priority forest birds at select demonstration sites (e.g., increase snags for Northern Flickers and Red-headed Woodpeckers) and evaluate effects on the abundance, distribution and productivity
- Promote the identification and management of significant, high quality woodlands that support source populations of priority species including large intact forest tracts, and mature and old growth forests.
- Promote the strategic restoration of forest cover and natural ecological processes at sites that were historically forested in areas with less than 30% regional forest cover.

Recommended Conservation Actions for Grassland/ Agricultural Landbirds

Monitoring

- Maintain or increase surveillance, inventory and monitoring efforts for rare breeding grassland birds including Barn Owl, Henslow's Sparrow, Loggerhead Shrike, Northern Bobwhite, and Short-eared Owl.
- Develop special surveys to determine the abundance and distribution of the wintering Short-eared Owl population.

Research and Evaluation

- Identify and quantify what factors other than habitat loss are contributing to the decline of grassland birds in ON BCR 13.
- Evaluate the results of available grassland/agricultural bird research to develop a synthesis of the current understanding as to how grassland condition (size, structure, composition) and management practices affect the abundance, distribution and demographics of priority grassland birds in southern Ontario.
- Evaluate the impact of various agricultural practices on the abundance, distribution, and productivity of priority grassland/agriculture landbirds in ON BCR 13.

Planning and Policy

- Coordinate grassland landbird conservation actions with conservation efforts targeting native grassland ecosystems and other grassland species.
- Coordinate grassland/agriculture landbird conservation efforts with other environmental stewardship programs targeting the agro-ecosystem (e.g., Environmental Farm Plan).
- Investigate options for developing an incentive-based grassland habitat program (similar to the U.S. Conservation Reserve Program) to maintain sufficient agricultural grassland habitat to sustain grassland bird populations in this region.

Outreach and Education

- Promote the development and use of best management practices for tame grasslands and croplands as appropriate for the protection of priority grassland birds by public and private landowners in southern Ontario (e.g., Solymar 2005).
- Promote the development of educational materials for rural landowners and land managers, such as the *Birds on the Farm* booklet (McGauley et al. 2004).
- Promote the value of prescribed burns as a safe, beneficial and cost-effective land management practice for restoring and maintaining natural grasslands.
- Encourage ranchers to adjust the timing and duration of livestock grazing activities and the timing of haying operations to minimize adverse effects on landbirds.

Applied Conservation

- Implement conservation actions in SAR Recovery Strategies for Barn Owl, Henslow's Sparrow, Loggerhead Shrike, and Northern Bobwhite.
- Identify and protect core areas of high-quality grasslands that support important populations of priority grassland birds.
- Promote the restoration and protection of large blocks of natural grassland habitats including the following priority areas:

Carden Plain (alvar)
 Napanee Limestone Plain (alvar)
 Manitoulin Island (alvar)
 Cabot Head (alvar)
 Eastern Lake St. Clair (prairie/savannah)
 Rice Lake Plains (prairie)

- Promote efforts to maintain agricultural grassland habitats in areas that support important breeding populations of grassland birds (and other significant wildlife species) including:
 - Carden Limestone Plain
 - Napanee Limestone Plain
 - Prince Edward County
 - Amherst Island
 - Wolfe Island
 - Luther Marsh
 - Haldimand County
 - Bruce County
 - Manitoulin Island
- Promote efforts to maintain agricultural grassland habitats in areas that support important wintering raptor populations including the following priority sites:
 - Prince Edward Point
 - Amherst Island
 - Wolfe Island
 - Haldimand Clay Plain (Fisherville)

Recommended Conservation Actions for Shrub/Successional Landbirds

Monitoring

- Periodically assess (every 5 years) the abundance, distribution and population status of Golden-winged Warbler, Prairie Warbler and Yellow-breasted Chat.
- Investigate the feasibility of using information on land use change and/or disturbance rates as surrogate measures for monitoring some shrub/successional habitats.

Research and Evaluation

- Identify factors causing declines and/or limiting population growth of Black-billed Cuckoo, Brown Thrasher, Eastern Towhee, Field Sparrow, Golden-winged Warbler (in SW and NW sub-regions) and Yellow-breasted Chat.
- Research the interactions of Blue-winged Warbler and Golden-winged Warblers in areas of overlap.
- Assess the affect of alternate right-of-way management techniques on the abundance and diversity of shrub/successional landbirds.
- Determine an appropriate guideline for the minimum threshold needed to maintain shrubland bird biodiversity throughout this region.

Planning and Policy

- Coordinate shrub/successional landbird conservation actions with those for non-landbird shrubland species, such as American Woodcock, and habitat management actions to maintain grassland habitat or increase forest cover.
- Develop landscape-level management plans for rights-of-way and other managed shrub/successional habitats to ensure an adequate and diverse supply of shrub/successional habitat.

Outreach/Education

- Promote the development and use of best management practice guidelines for the conservation of priority shrubland birds on managed shrublands (e.g., roadsides and utility corridors).

- Promote the value of riparian and lakeshore thickets as both stream buffers and important habitat for breeding and migrant landbirds.
- Promote the value of prescribed burns as a safe, beneficial and cost-effective land management practice for restoring and maintaining natural shrubland habitats (shrub alvar, savannah).
- Promote the development of educational materials to increase awareness of the conservation value of “scrubby” lands in all landscapes (e.g., *Birds on the Farm* booklet by McGauley et al. 2004).
- Encourage ranchers to adjust the timing and duration of livestock grazing activities to minimize adverse effects on shrubland birds and habitats.

Applied Conservation

- Restore and manage for native shrub species along roadsides, rights-of-way, riparian corridors.
- Adopt practices that avoid the use of herbicides, retain snags and downed woody debris and leaf litter, and control the spread of exotic vegetation.
- Evaluate the effects of increasing the amount of shrub/successional habitat and/or using various habitat management techniques at demonstration sites on the abundance, productivity and site fidelity of priority shrub/successional landbirds.
- Promote the restoration and protection of natural shrubland habitats in areas of importance to priority shrub/successional landbirds including:
 - Eastern Lake St. Clair
 - Pelee Island
 - Point Pelee
 - Port Franks Dunes
 - Elgin County
 - Norfolk County
 - Halton County
 - Twelve Mile Creek Headwaters
 - Carden Limestone Plain
 - Prince Edward County
 - Napanee Limestone Plain
 - Frontenac Axis

Recommended Conservation Actions for Landbirds in Other Habitats

Monitoring

- Complete comprehensive region-wide mapping of riparian habitats including an assessment of current condition, vegetation structure, and restoration potential.

Research and Evaluation

- Identify the cause(s) of the observed or apparent declines in the population and/or distribution of the following priority species in southern Ontario: Baltimore Oriole, Bank Swallow, Belted Kingfisher, and Chimney Swift.
- Study the impact of aquatic and landscape factors on the productivity and survivorship of priority riparian/shoreline landbirds including Bald Eagle, Bank Swallow, Baltimore Oriole, and Belted Kingfisher.

Outreach/Education

- Include guidelines for the protection of bank-nesting species, such as Bank Swallow and Belted Kingfisher, in best management practices for operators of sand and gravel pits.
- Continue to develop and implement a communications and reporting strategy to draw attention to the links between toxin levels in Bald Eagle and Peregrine Falcon populations, and human and ecosystem health.

Applied Conservation

- Identify and protect specialized nesting sites, including Bald Eagle nest trees, Peregrine Falcon nesting sites, large Bank Swallow nesting colonies, and large post-breeding roost sites for Chimney Swift and Bank Swallow.

- Enhance water clarity in water bodies by implementing remedial measures such as creation of buffer strips and fencing to keep livestock out of streams.

Recommended Conservation Actions for Aerial Insectivores

Monitoring

- Develop and implement crepuscular bird survey protocol(s) to improve understanding of the abundance, distribution and population trends in crepuscular species including Whip-poor-will, Common Nighthawk, and Chimney Swift.
- Encourage submission of current and historic nest record data to the Ontario Nest Records Scheme/ Project NestWatch to improve understanding of changes in productivity, especially for Barn Swallows, Tree Swallows, and Purple Martins.

Research and Evaluation

- Identify factors causing population decline and/or limiting population growth of aerial-foraging insectivores. Analyze long-term data sets and broad-scale nest record datasets to evaluate the importance of weather and other factors in the decline of aerial insectivores. Potentially important data sets in southern Ontario include the Ontario Nest Records Scheme data (Peck 2005, www.birdsontario.org/onrs/onrsmain.html), and site-specific long-term data sets (e.g., long-term Tree Swallow study at Long Point Bird Observatory includes 30+ years of data on nest box occupancy rates, productivity, survivorship, and insect availability at three sites).