



**EASTERN HABITAT JOINT VENTURE
FIVE YEAR (2007-2012) PLAN FOR THE
IMPLEMENTATION OF THE
NORTH AMERICAN WATERFOWL MANAGEMENT PLAN
IN
NOVA SCOTIA**



June, 2008

**Nova Scotia Eastern Habitat Joint Venture
Five-Year Implementation Plan
2007-2012**

Nova Scotia Eastern Habitat Joint Venture Steering Committee

Ducks Unlimited Canada
Environment Canada – Canadian Wildlife Service
Nature Conservancy of Canada
Nova Scotia Department of Natural Resources
Nova Scotia Department of Agriculture

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The Nova Scotia Eastern Habitat Joint Venture Steering Committee is pleased to approve the Eastern Habitat Joint Venture five-year Implementation Plan, which describes the implementation of the North American Waterfowl Management Plan in Nova Scotia from 2007-2012. This plan reflects the interest of all Nova Scotia Eastern Habitat Joint Venture partners to conserve wetland and associated upland habitats throughout Nova Scotia for the benefit of waterfowl and other wild species.

Approved by the members of the Nova Scotia Eastern Habitat Joint Venture Steering Committee on _____, 2008.

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Executive Summary

The Nova Scotia Eastern Habitat Joint Venture (NS-EHJV) Implementation Plan (IP) is intended to guide the NS-EHJV for the next five years (2007-2012), and also provide valuable information and benchmarks for future planning. It was developed over a period of almost two years (Jan 2006-November 2007), and involved the expertise of many staff working for several government and non-government agencies throughout Nova Scotia and other parts of eastern Canada. The plan was prepared using the best and most current information available from all partners. However, in many cases information was limiting. To help “close these information gaps”, a list of general assumptions and guiding principles was developed and accepted by all partners.

The IP builds upon the past success of the NS-EHJV in managing waterfowl resources. It differs from past plans in that it aims to better link provincial waterfowl population numbers to habitats. The IP describes the current status of Nova Scotia’s freshwater wetlands and coastal habitat resources. It also provides information on provincial population estimates and goals for six NS-EHJV priority waterfowl species (American black duck, mallard, green winged teal, ring-necked duck, Canada goose and common eider). The analysis of waterfowl population numbers ultimately led to the development of habitat goals and the identification of actions required to meet these goals.

The NS-EHJV partners plan to deliver a suite of conservation actions in order to achieve the goals identified in this plan including: habitat securement (3,937 ha); enhancement (1,950 ha); management (13,846 ha); stewardship (6,000 ha); and evaluations, communications, policy and coordination. The end result will be more habitats conserved for more waterfowl and other wildlife.

While issues relating to waterfowl and their habitats are province wide, there is a need to focus conservation efforts on the most important areas. The NS-EHJV identified three priority Ecoregions (Valley and Central Lowlands, Northumberland and Bras d’Or Lowlands, and Atlantic Coast), based on assessments of waterfowl use, habitats and threats. Conservation actions will be delivered in both the Coastal and Inland Key Program Areas within these ecoregions.

This IP outlines an ambitious program and will require significant resources to deliver. The NS-EHJV partners estimate that approximately \$12,255,000 is required to deliver the activities needed to meet the goals outlined in this IP. The partners also estimate that a resource deficit of over \$5,200,000 will occur if NS-EHJV funding levels are not increased from levels achieved over the past five years. It is clear that more resources will be required in order to effectively deliver the goals of this IP.

Waterfowl and their habitats remain a clear priority of the NS-EHJV. However, efforts to bring other government and non-government organizations into the NS-EHJV will be expanded as links to other bird initiatives are developed.

NS-EHJV partners are proud of their past achievements and are looking forward to collaboratively working together to expand and strengthen the partnership to achieve the goals outlined in this IP.

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Overall support and direction for the plan came from Steering Committee members: Julie Towers (NSDNR), Keith McAloney (EC-CWS), Deanne Meadus (DUC), Andrew Cameron (NSDOA), John Foley (NCC) and Barry Sabeau (retired NSDNR).

INTRODUCTION

The North American Waterfowl Management Plan (NAWMP) was signed by Canada and the United States in 1986, and expanded to include Mexico in 1994. The plan pursued a partnership approach to international conservation with goals to conserve wetland and associated upland habitats for waterfowl. The Plan's continental approach to conservation was implemented through regional and species joint ventures.

The Eastern Habitat Joint Venture (EHJV) was formed in 1988 and officially implemented in 1989 at the Wildlife Ministers' Council. The EHJV covers the geographical jurisdictions of Canada's six eastern provinces (Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador.)

The original purpose of the EHJV was to secure the waterfowl resources of eastern Canada by maintaining and enhancing the quantity and quality of wetland habitat through direct and indirect programs aimed at securing, enhancing and restoring valuable wetland habitat.

The major accomplishments of the EHJV were outlined in the 2005 EHJV Assessment Report. This report outlines significant gains in wetland and associated upland habitat conservation delivered by the EHJV partners since the inception of NAWMP. In Nova Scotia, the EHJV partnership is continuing to grow and involves Wildlife Habitat Canada, Ducks Unlimited Canada, the Nature Conservancy of Canada, the Canadian Wildlife Service, the Nova Scotia Department of Natural Resources, the Nova Scotia Department of Agriculture and numerous community-based conservation groups, corporations and individual landowners. These partners have contributed in excess of \$19,500,000 on habitat securement (36,700 hectares), enhancement (10,400 hectares) and management (13,200 hectares) since 1989.

Despite the conservation successes of the EHJV in Nova Scotia over the past 15 years, a number of challenges for wetland habitat conservation remain. The Nova Scotia EHJV partnership is well positioned to address these challenges in the future through the cooperative delivery of landscape directed programs that are based on a strong scientific foundation.

The following plan outlines Nova Scotia's approach for the next five years (2007-2012) of NAWMP implementation in Canada.

GENERAL ASSUMPTIONS AND GUIDING PRINCIPLES

The following list of general assumptions and guiding principles was drafted by the members of the NS-EHJV Steering and Technical Committee to facilitate the development of the 2008 NS-EHJV Implementation plan.

GENERAL ASSUMPTIONS

- The availability of food (invertebrates) is limiting – adding more open water marsh will increase invertebrate production and improve waterfowl brood habitat and increase waterfowl populations in the agricultural landscape.
- Duckling survival is a primary limiting factor for NS-EHJV key waterfowl species.
- Nest success is not limiting for NS-EHJV key waterfowl species.
- Waterfowl densities in the agricultural landscape are greater than in the forest landscape.
- Waterfowl habitat in the forest landscape is currently stable.
- The relationship between habitat conditions and waterfowl populations in the Maritimes requires further information.
- The NS-EHJV Wetland Stewardship Program is best positioned to promote and deliver Beneficial Management Practices (BMP's) that conserve wetland habitat in the agricultural landscape to agricultural practitioners, producers and land users.
- Restoring small wetlands in the periphery of large wetlands is assumed to increase the overall carrying capacity of the landscape.
- Non-breeding season survival is an important factor in population dynamics and influences habitat occupancy.
- Habitat objectives for key species are assumed to reflect and accommodate the needs of other waterfowl species within NS.
- The availability of waste grain and legumes from agricultural activities is assumed to meet the energetic needs of staging Canada geese.
- For sea ducks and coastal waterfowl we assume that anthropogenic factors may be influencing access to these resources.
- Climate change may contribute to larger populations of wintering waterfowl along Nova Scotia's coast.

GUIDING PRINCIPLES

- NS-EHJV conservation activities overlap the agricultural sectors interest (e.g. water quality and riparian health).
- Habitat securement priorities for the NS-EHJV include:
 - Coastal Islands with breeding populations of common eider and other colonial nesting bird.
 - Large contiguous salt marsh parcels.
 - Private in-holdings within coastal management areas and sanctuaries.
- Private land stewardship is recognized as having positive effects on wetland habitat and waterfowl population.
- Maintaining existing managed wetlands is a priority for the NS-EHJV.
- Evaluation is an important component of the NS-EHJV Program - partners and funding for evaluations need to be identified during project planning.

HABITATS

Wetlands

Nova Scotia has over 570,000 hectares of freshwater and coastal wetlands that cover more than 10% of the provincial land and water area (Tables 1; 2). These wetlands are distributed throughout the province and occur in all Ecoregions.

Table 1. Nova Scotia Freshwater Wetland (NSDNR Wetland Database).

Freshwater Wetland Type	Hectares
Bog	228,096
Fen	60,696
Deep Marsh	8,475
Shallow Marsh	855
Seasonally Flooded Flat	7,357
Meadow	3,681
Shrub Swamp	38,005
Wooded Swamp	1,149
Lakeshore Wetland	8,928
TOTAL	357,242

Table 2. Nova Scotia Coastal Wetlands (NSDNR Wetland Database)

Coastal	Hectares
Salt Marsh	17,100
Saline Ponds	4,500
Estuarine Flat	51,963
Marine Flat	144,541
Total	218,104

The ecological diversity of the provinces' freshwater wetlands supports a diverse group of wildlife, including many of Nova Scotia's species at risk. Nova Scotia inland wetlands are particularly important for waterfowl including American black duck, ring-necked duck and green-winged teal. In Nova Scotia, many bird species depend on wetlands throughout the year for nesting, brood rearing, migrating and wintering habitat.

Nova Scotia's wetlands perform vital ecological and social functions including carbon storage, ground water recharge, discharge, and control or abatement of: flooding; drought; soil erosion; and pollution. Wetlands also support valuable recreational, educational and scientific opportunities.

Nova Scotia's coastal wetlands and intertidal waters provide critical breeding, molting or migration habitat for many species including common eider, scoter, leach's storm petrel, double crested and great cormorant. The area is also is a key wintering site for many waterfowl species including American black duck, Canada geese and the harlequin duck (eastern population).

Coastal Islands

There are thousands of islands scattered along Nova Scotia's coast. These islands range in size from just a few square meters to thousands of hectares, and represent more than one percent (greater than 50,000 hectares) of the total provincial land base. Coastal islands are formed from bedrock outcrops; as glacial deposits (drumlins) from the last ice age; or as barrier islands created from the ocean's movement of marine soils.

Islands provide unique habitats for common and rare animals and plants. Many species use islands as these areas are relatively free of predators. Islands provide excellent habitat for nesting and migrating seabirds, waders and songbirds. Colonial breeding birds such as common eider, puffin, razorbill and Leach's storm petrel nest exclusively on islands. Islands along the southern end of the province provide ideal rest stations for hundreds of thousands of birds on their way north or south during their migration through the Atlantic flyway (Appendix I). Nova Scotia's islands also provide habitat for species at risk including the *Endangered* roseate tern, which is known to nest on only a few islands in Canada and the harlequin duck, which winters and feeds along exposed rocky headlands and reefs of coastal islands.

WATERFOWL POPULATIONS

BREEDING WATERFOWL

Sixteen species of waterfowl are known to regularly breed and nest in Nova Scotia (Table 3). Two other species (redhead and ruddy duck) are infrequent breeders. The common eider nests colonially on offshore islands and raises broods in the shallow waters along the coast. All other breeding waterfowl are widely dispersed throughout the provinces freshwater and coastal wetlands during breeding and brood rearing. Several breeding waterfowl species (e.g. gadwall, American wigeon, northern shoveler) have only established breeding populations in Nova Scotia during the past century, and occur mostly in the larger managed wetlands (e.g. constructed wetland impoundments) of the province.

Table 3. Nova Scotia Breeding Waterfowl	
Annual Breeders	Occasional / Infrequent Breeders *
American black duck	Redhead
American wigeon	Ruddy duck
Blue-winged teal	
Canada goose	
Common eider	
Common goldeneye	
Common merganser	
Gadwall	
American Green-winged teal	
Hooded merganser	
Mallard	
Northern pintail	
Northern shoveler	
Red-breasted merganser	
Ring-necked duck	
Wood duck	

* No records to confirm that these species are “annually” breeding in Nova Scotia.

WINTERING WATERFOWL

Fifteen species of waterfowl are known to regularly over-winter in the open waters surrounding Nova Scotia's coast (Table 4). A few other species (e.g. green-winged teal, ring-necked duck) occasionally over-winter in very low numbers. Nova Scotia annually supports the highest over-wintering population of Canada geese (> 10,000) and American black ducks (> 20,000) in Atlantic Canada. Global warming may contribute to larger populations of wintering waterfowl along Nova Scotia's coast.

Table 4. Nova Scotia Wintering Waterfowl
American black duck
Canadian goose
Common eider
Mallard
Common goldeneye
Long-tailed duck
Scaup
Bufflehead
Harlequin
Common merganser
Red-breasted merganser
Brant
White-winged Scoter
Black Scoter
Surf Scoter

STAGING WATERFOWL

Nova Scotia has many coastal wetland sites where large numbers of waterfowl traditionally congregate during the spring and fall migration (Figure 4). Currently there are no waterfowl staging surveys conducted in Nova Scotia to determine population abundance estimates and diversity at these sites during migration periods. However, it is common to view thousands of common eider, American black duck and Canada geese in these areas during the staging periods.

ACCIDENTAL / VAGRANT WATERFOWL

Several species of waterfowl sometimes traveled outside of their usual range and have occurred infrequently and unpredictably in Nova Scotia (Table 5)

Table 5. Accidental / Vagrant Waterfowl
King eider
Canvasback
Eurasian wigeon
Greater snow goose
Greater white-fronted goose
Tundra swan
Fulvous whistling duck
Barrow's goldeneye

SPECIES AT RISK - WATERFOWL

The harlequin duck (eastern population) is the only waterfowl species in Nova Scotia that is listed under the NS Endangered Species Act (<http://www.gov.ns.ca/natr/wildlife/biodiv/specieslist.htm>). The harlequin duck was listed as *Endangered* in Nova Scotia in 2000. This species is at risk because of its small population size and other factors including illegal hunting and oil spills. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) down-listed eastern harlequin ducks into a lower risk category (from *Endangered* to *Special Concern*) in 2001 based on new information indicating the population (throughout the range) is larger than previously thought.

The harlequin duck is also listed as Red – “known to be, or is thought to be at risk”, in the General Status Ranks of Wild Species in Nova Scotia: www.gov.ns.ca/natr/wildlife/genstatus .

Atlantic Brant (*Branta bernicla*) and Barrow's goldeneye are the only other two species of waterfowl listed in the general status reports - both rank provincially as Yellow – “sensitive to human activities or natural events”.

THREATS AND OBSTACLES

In Nova Scotia, like many other places in North America, the extent and quality of wetland and other natural habitats have been affected by human development. Traditional land use practices have resulted in loss of wetlands, degraded water quality in many waterways, streamside erosion, and altered habitats for wildlife throughout the province. For example, over 61% of original saltmarsh habitat in the province has been dyked and drained since the Acadians first settled the area in the 1600's. Saltmarshes provide habitat for many waterfowl and shorebirds, and their primary production is also responsible for fueling the high level of secondary production observed in the adjacent mudflats.

Even with the recent emphasis placed on conservation, wetlands and coastal habitats are still at risk through human activities. Threats to breeding habitat, migratory staging habitats and wintering habitat can impact wildlife including waterfowl and other bird groups. Some of the threats that exist in Nova Scotia today are:

- Land clearing for agricultural and residential development in inland areas.
- Industrial encroachment of undeveloped and unprotected coastal and inland areas.
- Growing human population and urban/suburban expansion along the coast.
- Expanding aquaculture industry along the coast.
- Tanker traffic and the potential for catastrophic oil spills along the coast.
- Coastal erosion from land use and rising sea levels.
- Ecotourism and other human related disturbance to colonial nesting birds on some islands.
- Uncontrolled sheep grazing on some coastal islands.
- Baitworm harvesting on some mudflats.
- Recreational use and cottage development along the coast and around freshwater wetlands.
- Proposed developments for energy (tidal power, wind power, etc).

There are also obstacles that can affect the delivery of NS-EHJV habitat conservation programs. Some of these obstacles include:

- Increased human fears of wildlife diseases – particularly those transmitted by migratory birds (i.e. avian influenza) - and concerns of impacts on human health/food safety and costs of biosecurity.
- Limited extent of coastal “habitat conservation” areas.
- Dramatic increase in costs of coastal islands and waterfront properties.

WATERFOWL PRIORITIZATION

Nova Scotia Key Waterfowl Species

Six species were listed as “key waterfowl species” for Nova Scotia based on general criteria including: provincial species contribution to continental population; general species population trends (e.g. species population declining or increasing to dangerous levels); importance to flyway and provincial harvest; seasonal relevance (e.g. breeding, wintering, staging and molting) during the life cycle stage in Nova Scotia; and species response to management activities.

Table 6 outlines the key waterfowl species for the NS-EHJV as identified by the NS-EHJV Steering Committee in September 2006.

Table 6: Key waterfowl species in Nova Scotia, and the seasonal relevance of Nova Scotia to these species. <i>Note: List created at NS-EHJV Steering Committee Meeting – September 19, 2006</i>		
Species	Abbreviation	Seasonal Relevance
American black duck	ABDU	Breeding, Wintering, Staging
Mallard	MALL	Breeding, Wintering, Staging
Common eider	COME	Breeding, Wintering, Staging, Molting
Canada goose (NAP)	CAGO	Wintering, Staging
Canada goose (resident)	CAGO	Breeding, Wintering
Ring-necked duck	RNDU	Breeding, Staging
Green-winged teal	AGWT	Breeding

Waterfowl Conservation Region 14 Prioritization

Nova Scotia is located in Waterfowl Conservation Region (WCR) 14 (see Appendix II). Table 7 outlines the “waterfowl prioritization” rankings for WCR 14. The American black duck, common eider and mallard all rank “high” as a continental priority in WCR 14 and efforts to conserve habitat for these species will be a priority for the Nova Scotia EHJV Program. The Canada goose (NAP) ranks as “moderate high”, and green-winged teal and ring-necked ducks both rank as “moderate” as a continental priority for WCR 14.

Table 7. Waterfowl Prioritization Chart for WCR 14 (*adopted from NAWMP 2004 Implementation Plan*)

Species/Population	Continental Priority	Breeding Importance	Breeding Need	Nonbreeding Importance	Nonbreeding Need	Continental Trend 1970-2003
American black duck	HIGH	HIGH	HIGHEST	MOD HIGH	HIGH	DECREASING
Common eider	HIGH	HIGH	HIGHEST	HIGH	HIGHEST	DECREASING
Lesser scaup	HIGH			MOD LOW	MODERATE	DECREASING
Mallard	HIGH	MOD LOW	MODERATE	MOD LOW	MODERATE	STABLE
Northern pintail	HIGH	MOD LOW	MODERATE	MOD LOW	MODERATE	DECREASING
Canada goose - North Atlantic	MOD HIGH			HIGH	HIGH	INCREASING
American wigeon	MOD HIGH	MOD LOW	MOD LOW	MOD LOW	MOD LOW	STABLE
Black scoter	MOD HIGH			MOD LOW	MOD LOW	DECREASING
Blue-winged teal	MOD HIGH	MOD LOW	MOD LOW			STABLE
Common goldeneye	MOD HIGH	MOD HIGH	MOD HIGH	MOD HIGH	MOD HIGH	STABLE
Long-tailed duck	MOD HIGH			HIGH	HIGH	DECREASING
Surf scoter	MOD HIGH			HIGH	HIGH	DECREASING
White-winged scoter	MOD HIGH			MOD HIGH	MOD HIGH	DECREASING
Barrow's goldeneye	MODERATE			MOD HIGH	MOD HIGH	STABLE
Bufflehead	MODERATE	MOD LOW	MOD LOW	MOD LOW	MOD LOW	INCREASING
Gadwall	MODERATE	MOD LOW	MOD LOW			INCREASING
Green-winged teal	MODERATE	MOD HIGH	MOD HIGH	MOD LOW	MOD LOW	INCREASING
Harlequin duck	MODERATE			MOD HIGH	MOD HIGH	STABLE
Ring-necked duck	MODERATE	MOD HIGH	MOD HIGH			INCREASING
Wood duck	MODERATE	MOD HIGH	MOD HIGH	MOD LOW	MOD LOW	INCREASING
Atlantic brant	MOD LOW			MOD HIGH	MODERATE	STABLE
Common merganser	MOD LOW			MOD HIGH	MODERATE	INCREASING
Hooded merganser	MOD LOW	MOD HIGH	MODERATE			INCREASING
Red-breasted merganser	MOD LOW			MOD HIGH	MODERATE	INCREASING

The NSST [*National Science Support Team*] developed scores for threats to habitats within WCRs using the following:

- Very Low: Expected future conditions better than historical conditions.
- Low: Expected future conditions similar to historical conditions – no known threats.
- Moderate: Slight to moderate decline in future habitat abundance or quality, but current conditions similar to historical conditions; or, future conditions expected to be stable but significant habitat losses have already occurred.
- Moderately High: Severe past or expected future deterioration or decline in habitat quality or availability.
- High: Extreme past or expected future deterioration or decline in habitat quality or availability.

POPULATION GOALS

Ten-year waterfowl population goals (Table 8) were established using the results of current monitoring programs including the Eastern Canada Waterfowl Surveys and the Nova Scotia Mid-Winter Waterfowl Survey. Staging waterfowl surveys are currently not conducted in Nova Scotia. New monitoring programs are currently under development for species and/or landscapes that are not well represented in the current surveys (e.g. mallards in the agriculture landscape). Updated population objectives will be established for these species after data from the new surveys is analyzed.

Table 8. Ten year population goals for priority Nova Scotia waterfowl species.				
Species	10 Year Population Goals *			
	Breeding (IBP)	Wintering (Individuals)	Staging	Molting (Individuals)
American black duck	37,000 ↑	20,000 ↑	**	N/R
Mallard	2,000 ↑	**	**	N/R
Common eider	12,000 ↑	10,000 ↔	**	40,000 ↔ ***
Ring-necked	7,500 ↑	N/R	**	N/R
Green-winged teal	4,000 ↑	N/R	**	N/R
Canada goose (NAP)	N/R	15,000 (NAP and resident combined) ↔	**	N/R
Canada goose (resident)	Population Goal - Not higher than 2006 levels. ↔		N/R	N/R

IBP = Indicated Breeding Pairs

* These goals were established with data available from current surveys.

** Insufficient data available to estimate goal.

N/R = Not relevant

*** Based on 2002 molting survey results

↑ = Population goal represents an increase from current population estimates

↔ = Population goal is equal to current population estimates

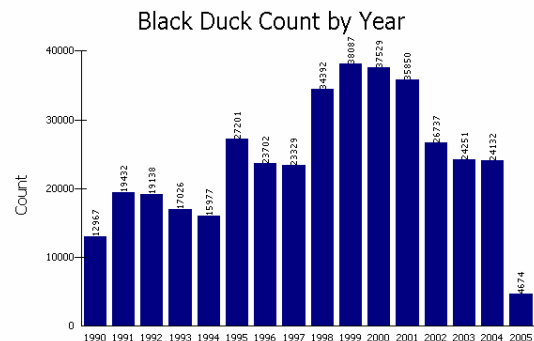
POPULATION GOALS - BREEDING

Nova Scotia EHJV breeding population goals were established for the American black duck, mallard, common eider, ringed-necked duck, green winged teal and Canada goose (resident population).

American black duck

GOAL: The 10-year breeding population goal for American black duck in Nova Scotia is 37,000 Indicated Breeding Pairs.

The annual breeding population estimates for American black duck in Nova Scotia ranged from 12,967 to 37,087 indicated breeding pairs (IBP) over the past 15 years. The general provincial IBP trend is stable for the same period and a 37,000 IBP goal represents an increase in population based on mean IBP values (Table 28). With 37,000 IBP, Nova Scotia is expected to contribute 37.4% of the breeding pairs of American black ducks in BCR 14; and 31% of the breeding pairs in Atlantic Canada.



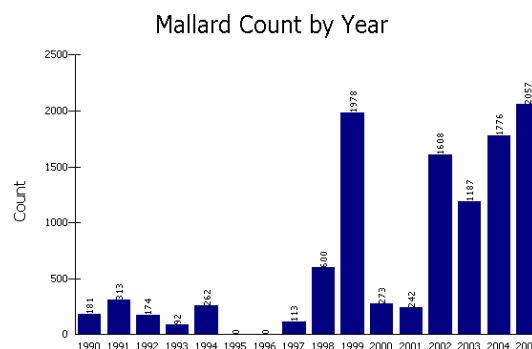
American Black Duck	BCR14	% of BCR 14	Total	% of EHJV	% of Atlantic Canada
Nova Scotia	37 000	37.4 %	37 000	11.0 %	31.1%
EHJV Total	99 000		336 700		



Mallard

GOAL: A 10-year breeding population goal for mallards in Nova Scotia is 2,000.

The annual breeding population estimates for mallard in Nova Scotia ranged from 0 to 2057 IBP over the past 15 years. The general provincial IBP trend is slightly increasing for the same period and a 2,000 IBP goal represents an increase in population based on mean IBP values (Table 28). With 2,000 IBP, Nova Scotia is expected to contribute 12.5% of the breeding pairs of mallards in BCR 14; and 33.3% of the breeding pairs in Atlantic Canada.



Mallard	BCR14	% of BCR 14	Total	% of EHJV	% of Atlantic Canada
Nova Scotia	2 000	12.5 %	2 000	0.9 %	33.3%
EHJV Total	16 000		212 800		



Ring-necked Duck

GOAL: A 10-year breeding population goal for ring-necked duck in Nova Scotia is 7,500.

The annual breeding population estimates for ring-necked ducks in Nova Scotia ranged from 2345 to 8060 IBP over the past 15 years. The general provincial IBP trend is stable for the same period

and a 7,500 IBP goal represents an increase in population based on mean IBP values (Table 28).

With 7,500 IBP, Nova Scotia is expected to contribute 20.8% of the breeding pairs of ring-necked ducks in BCR 14; and 15.5% of the breeding pairs in Atlantic Canada.

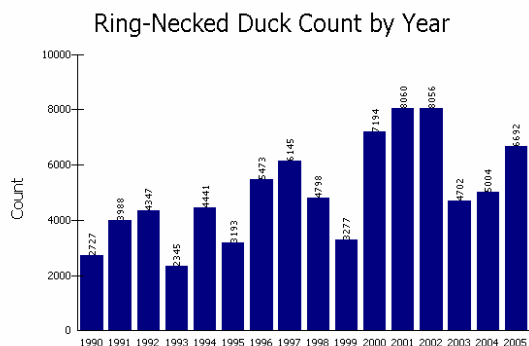


Table 11. Ring-necked duck breeding population goals.

Ring-necked Duck	BCR14	% of BCR 14	Total	% of EHJV	% of Atlantic Canada
Nova Scotia	7 500	20.8 %	7 500	4.3 %	15.5%
EHJV Total	36 000		173 900		



Green-winged Teal

GOAL: A 10-year breeding population goal for green-winged teal in Nova Scotia is 4,000.

The annual breeding population estimates for green-winged teal in Nova Scotia ranged from 819 to 8287 IBP over the past 15 years. The general provincial trend is stable for the same period and a 4,000 IBP goal represents an increase in population based on mean IBP values (Table 28). With 4,000 IBP, Nova Scotia is expected to contribute 20.0% of the breeding pairs of green-winged teal in BCR 14; and 17.7% of the breeding pairs in Atlantic Canada.

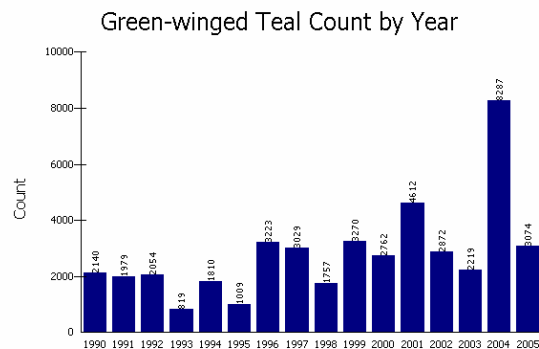


Table 12. Green-winged teal breeding population goals.

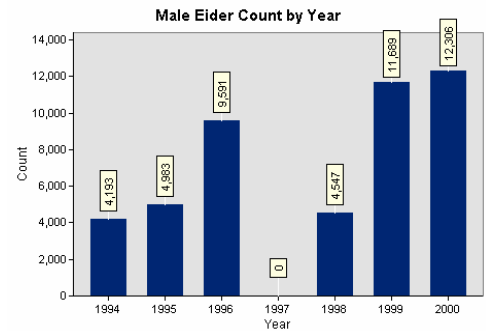
Green-winged teal	BCR14	% of BCR 14	Total EHJV	% of EHJV	% of Atlantic Canada
Nova Scotia	4 000	20.0 %	4 000	4.9 %	17.7%
Total	20 100		80 900		



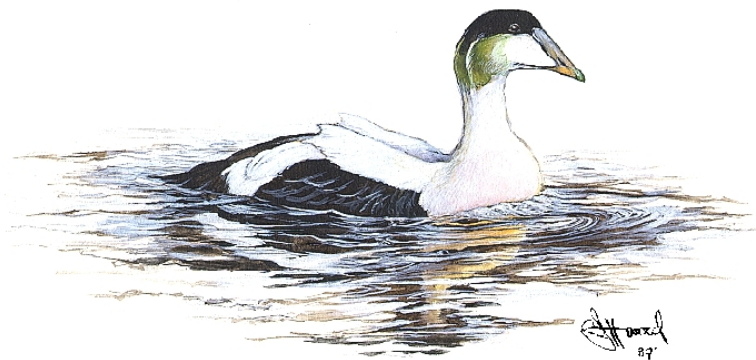
Common eider

GOAL: The 10-year breeding population goal for common eider duck in Nova Scotia is 12,000.

A.R. Lock estimated that the breeding population of common eider in Nova Scotia during a 1982 aerial census was 8,000 pairs. Approximately 96% of the eiders in this census were counted within the Atlantic Coastal Ecoregion. Lock's estimates were based on counts of adult males located within the survey area during breeding season between May 18-23 and assumed a 1:1 population sex ratio during breeding (i.e. for every adult male counted it was estimated that there was one adult female located within the breeding area).



Male counts of spring common eider during aerial surveys undertaken by the NSDNR along the Atlantic Coastal Ecoregion from 1994-2000 suggest a general increase in the breeding population during the period (see above graph). The mean population level for the same period is 7,884 IBP. A 12,000 IBP goal represents an increase in population based on mean IBP values from 1994-2000 and is comparable to the 1999 and 2000 data (11,689 & 12,306 adult males). The 1996 survey was lower than normal and may have been due to the timing of the survey, which was 2 weeks earlier than surveys of other years. Surveys were conducted along the coast and do not extend into protected inlets but outside headlands. The survey in 2000 was conducted using a Cessna 172, prior surveys were conducted in a twin engine Aztec.



Canada goose

GOAL: A 10-year breeding population goal for Canada goose in Nova Scotia is not higher than 2006 levels (e.g. to maintain current population levels).

There is insufficient data available to accurately estimate the annual breeding population for resident Canada geese in Nova Scotia. However, a combined annual breeding population for NS and NB was estimated from the Eastern Canada Waterfowl Survey (1990-2006). The annual breeding population estimates for Canada geese in NS and NB ranged from 262 to 4546 IBP. The general trend is increasing for the same period. A breeding population goal in NS of not higher than 2006 levels represents a stable breeding population for resident Canada geese.

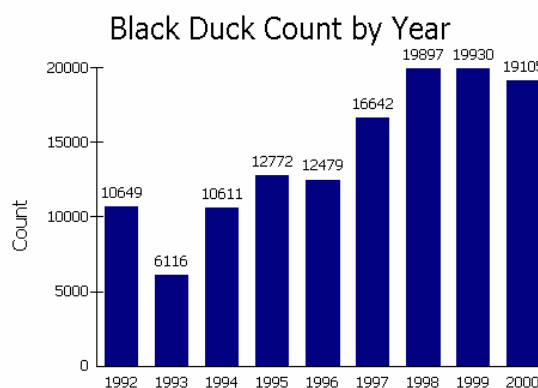
POPULATION GOALS – WINTERING

Nova Scotia EHJV wintering population goals were established for the American black duck, mallard, common eider and Canada goose (resident and north Atlantic population).

American black duck

GOAL: The 10-year wintering population goal for American black duck in Nova Scotia is 20,000.

American black ducks were counted during mid-winter waterfowl surveys conducted along Nova Scotia's coast from 1992-2000. On average, approximately 14,244 American black ducks populate the Nova Scotia coast during the winter (annual wintering population estimates ranged from 6,116 to 19,097 for the survey period) and a 20,000 goal represents an increase in population levels. These ducks are not evenly distributed around the coastline (Figure 1). Larger concentrations are located primarily along the Eastern Shore from Halifax-Cole Harbour and along the South Shore from Yarmouth to Lockport. On average, approximately 43% of wintering American black ducks in Nova Scotia are located in the Atlantic Coastal Ecoregion; 23% in the Northumberland /Bras d'Or Ecoregion; and 23% in the Valley and Central Lowlands Ecoregion (see page 29 for more information on NS Ecoregions).



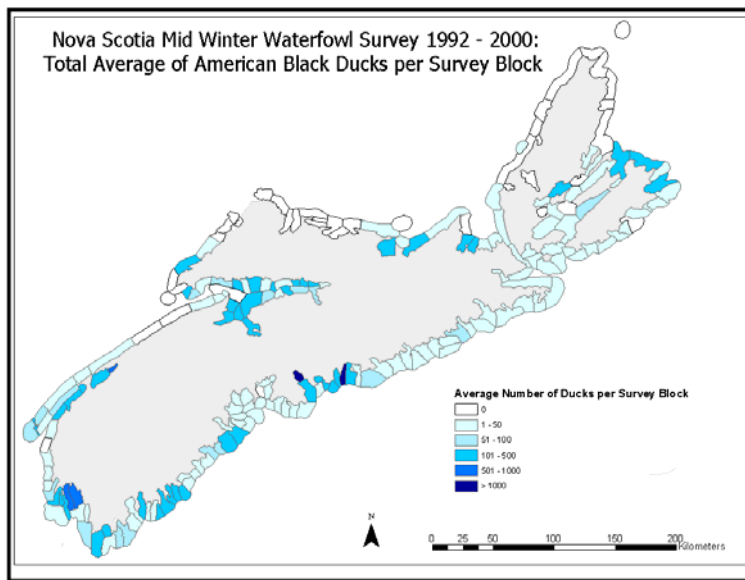
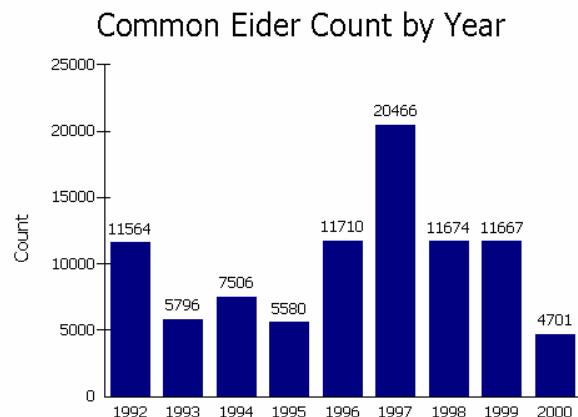


Figure 1. NSDNR Mid-Winter Waterfowl Survey – Average American black ducks per survey block.

Common eider

GOAL: The 10-year wintering population goal for common eider in Nova Scotia is 10,000.

Common eider were counted during mid-winter waterfowl surveys conducted along Nova Scotia's coast from 1992-2000. On average approximately 10,000 common eiders populate the Nova Scotia coast during the winter (annual wintering population estimates ranged from 4,701 to 20,466 for the survey period) and a 10,000 goal represents a stable mean population. Eiders are not evenly distributed around the coastline (Figure 2). Larger concentrations are located primarily along the Southwest Shore from Digby Neck to Weymouth, and along the South and Eastern Shore from Liverpool north to Country Harbour. On average, approximately 61% of wintering common eider in Nova Scotia are located in the Atlantic Coastal Ecoregion; <1% in the Northumberland /Bras d'Or Ecoregion ; and < 1% in the Valley and Central Lowlands Ecoregion. Much of the remaining wintering population exists in the Western Ecoregion and Fundy Shore Ecoregion.



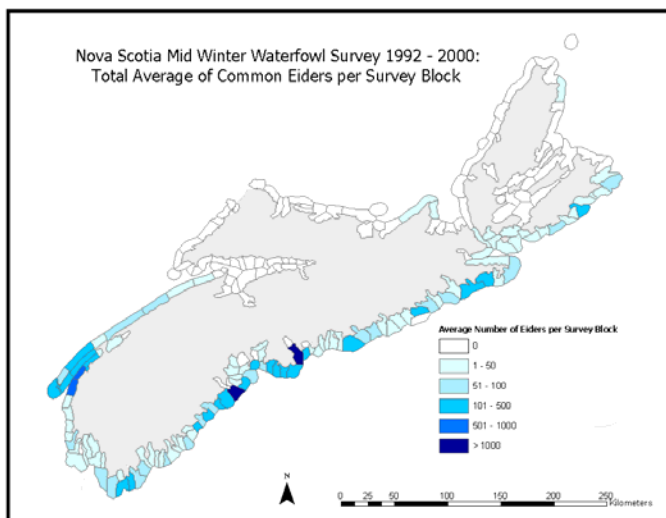
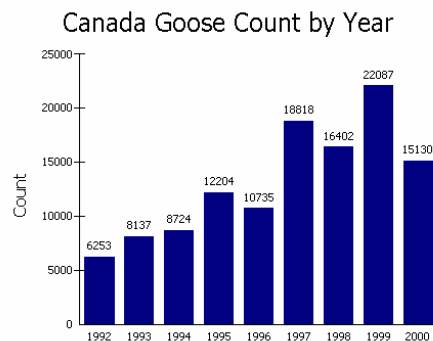


Figure 2. NSDNR Mid-Winter Waterfowl Survey – Average common eider per survey block.

Canada goose

GOAL: The 10-year wintering population goal for Canada goose in Nova Scotia is 15,000 (this includes both NAP and resident birds).

Canada geese were counted during mid-winter waterfowl surveys conducted along Nova Scotia's coast from 1992-2000. On average approximately 13,165 Canada geese populate the Nova Scotia coast during the winter (annual wintering population estimates ranged from 6,253 to 22,087 for the survey period). The population trend for wintering Canada geese is increasing in Nova Scotia) and a 15,000 goal represents a slight increase in population. Larger concentrations are located primarily along the Eastern Shore from Cole Harbour to Musquodoboit Harbour and along the South Shore from Port L'Hebert to Port Joli (Figure 3). Smaller concentrations are located in Pictou Harbour (along the Northumberland Strait) and along the Southwest coast from Yarmouth to Cape Sable. On average, approximately 86% of wintering Canada geese in Nova Scotia are located in the Atlantic Coastal Ecoregion; 3% in the Northumberland /Bras d'Or Ecoregion ; and <1% in the Valley and Central Lowlands Ecoregion.



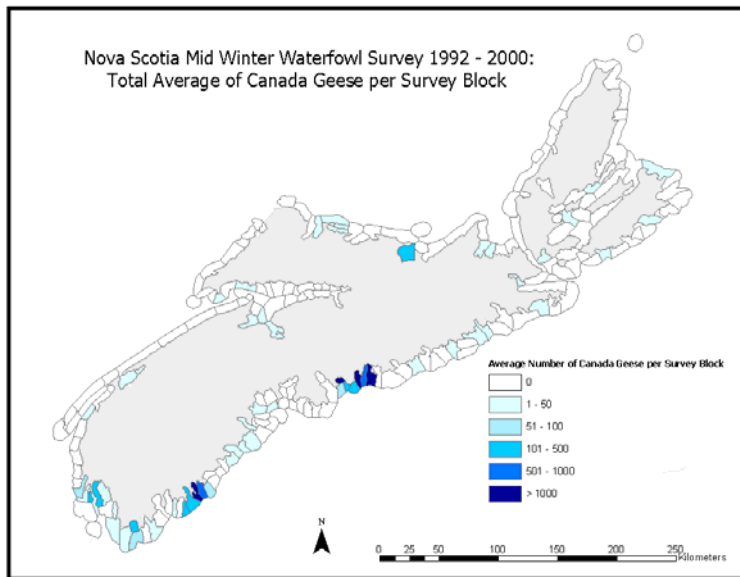


Figure 3. NSDNR Mid-Winter Waterfowl Survey – Average Canada goose per survey block.

Wintering Waterfowl Use Days

Wintering waterfowl use days (the use of an area by one bird for one day during the winter period) along Nova Scotia's coast were estimated for American black duck, Canada goose and common eider. A coastal wintering population estimate of 20,000 American black duck along Nova Scotia's coast over a 120 day winter period (December –March) equates to 2,400,000 wintering Waterfowl Use Days. A coastal wintering population estimate of 10,000 Canada goose along Nova Scotia's coast over a 120 day winter period (December –March) equates to 1,200,000 wintering Waterfowl Use Days. A coastal wintering population estimate of 7,000 common eider along Nova Scotia's coast over a 120 day winter period (December –March) equates to 840,000 wintering Waterfowl Use Days.

POPULATION GOALS - STAGING

Currently there are no monitoring programs in place to determine waterfowl staging distribution and abundance in Nova Scotia. Staging goals could not be identified for Nova Scotia priority waterfowl species due to the lack of reliable staging data. It is important to note that the major staging areas (Figure 4) are located primarily in the coastal landscape of the Atlantic Coastal Ecoregion, Northumberland /Bras d'Or Ecoregion, and the Valley and Central Lowlands Ecoregion.

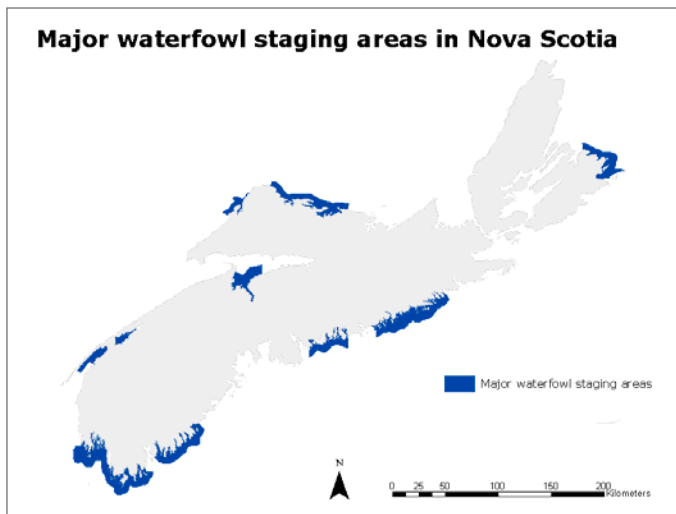


Figure 4. Nova Scotia Staging Areas.

Staging Waterfowl Use Days

Staging waterfowl use days (the use of an area by one bird for one day during the Fall staging period) along Nova Scotia's coast were estimated for American black duck, Canada goose and common eider. A coastal Fall staging population estimate of 17,000 American black duck along Nova Scotia's coast over a 50 day period (late August - October) equates to 850,000 staging Waterfowl Use Days. A coastal Fall staging population estimate of 20,000 Canada geese along Nova Scotia's coast over a 50 day period (September - November) equates to 1,000,000 staging Waterfowl Use Days. A coastal Fall staging population estimate of 19,000 common eider along Nova Scotia's coast over a 50 day period (late August - October) equates to 950,000 staging Waterfowl Use Days.



POPULATION GOALS - MOLTING

Nova Scotia EHJV molting population goals were established for one species - the common eider.

Common Eider – Molting

Information from NSDNR Surveys (2002) indicate that over 40,000 common eiders males molt along the provinces South Shore between Liverpool and Baccaro in mid August. This significant molting area is located in the coastal waters off of the Atlantic Coastal Ecoregion (Figure 5). A 40,000 goal represents a stable molting population.

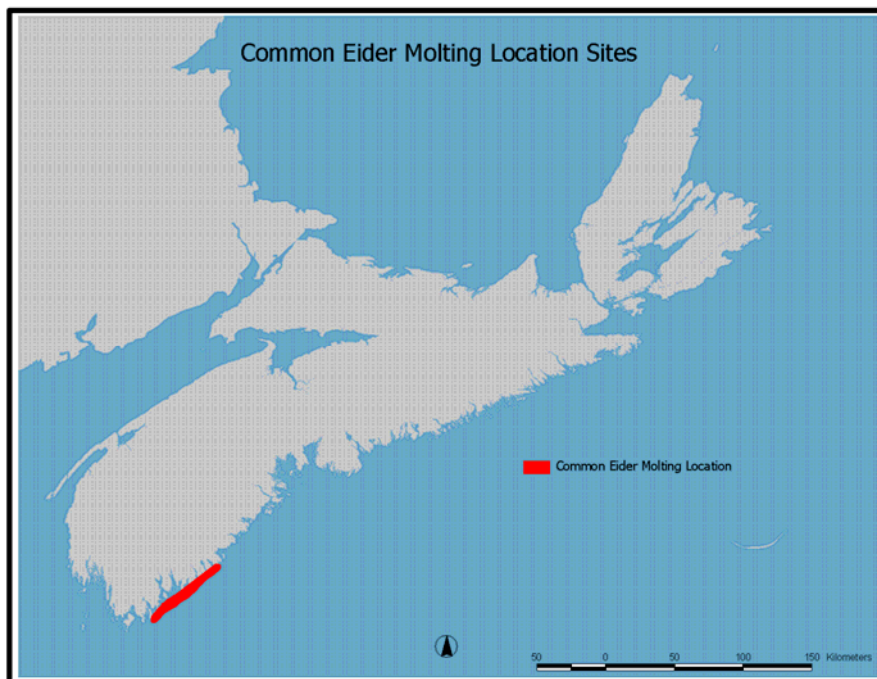


Figure 5. Nova Scotia male common eider molting area.

Molting Waterfowl Use Days

Molting waterfowl use days (the use of an area by one bird for one day during a molting period) along Nova Scotia's coast were estimated for male common eider. A coastal molting population estimate of 40,000 common eider along Nova Scotia's coast over a 30 day period (mid August - September) equates to 1,200,000 molting Waterfowl Use Days.

KEY PROGRAM AREAS AND PRIORITY LANDSCAPES

Key Program Areas

Key Program Areas (KPA) refers to the priority geographical and management areas under the NAWMP. The EHJV Program in Nova Scotia has two KPA's – Inland and Coastal. The **Coastal KPA** includes coastal wetlands and coastal islands of the coastal landscape. The **Inland KPA** includes all freshwater wetlands and associated habitats located primarily in the agricultural landscape.

Agricultural Landscape

The agricultural landscape of Nova Scotia represents a mosaic of farmed land, small woodlots, rough cover and urban development. The Bay of Fundy dyked land, the Northumberland Plain, and major river valleys are included in this landscape. Agricultural activity in Nova Scotia peaked in the late 1800's when 37% of the province's land base was actively farmed. While urban expansion continues to encroach this landscape, fewer but larger farms employing more intense farming practices still occur on approximately 4% (234,000 ha) of the provincial land base (1997 Agricultural Survey). Farm production is primarily potato, dairy, beef, hogs, sheep in addition to vegetables and fruit. Waterfowl use of this landscape is primarily for breeding. Historically, extensive wetland loss occurred in some regions and small-scale drainage and in-filling continues today. Slower and less obvious actions such as sedimentation and eutrophication may decrease the functional value of these wetlands to waterfowl, other wildlife and people.

Coastal Landscape

Nova Scotia has 10,700 km of salt water shoreline bounding on the Atlantic Ocean, Gulf of St. Lawrence, and Bay of Fundy. This coastal landscape is a complex mix of salt marshes, estuaries, tidal mud flats, islands, and saline ponds. Habitat variations occur among the Atlantic, Gulf and Fundy coasts as a result of varying tidal and climatic conditions. Except for the brief breeding season on inland fresh water marshes, waterfowl prefer the food rich coastal habitats for staging, molting, wintering and breeding (e.g. common eider). Most of Nova Scotia's human population is settled along the coast, and high demand for property development in coastal areas threatens additional and serious habitat loss. Urban, recreational and industrial development has impacted coastal habitats to varying degrees.

HABITAT GOALS

NS-EHJV habitat conservation programs generally consist of securement, enhancement and management activities. Long-range NS-EHJV habitat goals are located in Tables 13 and 38, and are based on the projected conservation action achievements from 2007-2012 for all partners.

Table 13. NS-EHJV 5-Year Habitat Conservation Targets			
	Wetland (hectares)	Upland (hectares)	Total (hectares)
Securement	NA	NA	3,937
Enhancement	NA	NA	1,950
Management	9,407	4,439	13,846

NA – Currently undetermined by the NS-EHJV Partners

PRIORITIZATION AREAS

Ecological Land Classification

Nova Scotia has nine distinct Ecoregions as defined in the provincial Ecological Land Classification (ELC) System (see <http://www.gov.ns.ca/natr/forestry/ecosystem/elcpg1.htm>). Ecoregions are subdivisions of the larger Acadian ecozone and express macroclimate as a distinctive ecological response to climate through soils and vegetation. The coastal and agricultural landscapes are located primarily in three Ecoregions (Figure 6), which represent almost one third of total area of the province (Table 14). These Ecoregions were adopted for the development of this implementation plan and form the geographical descriptions for the EHJV Program in Nova Scotia. These Ecoregions also overlap the priority areas identified by DUC (Figure 7) and NCC (Figure 8).

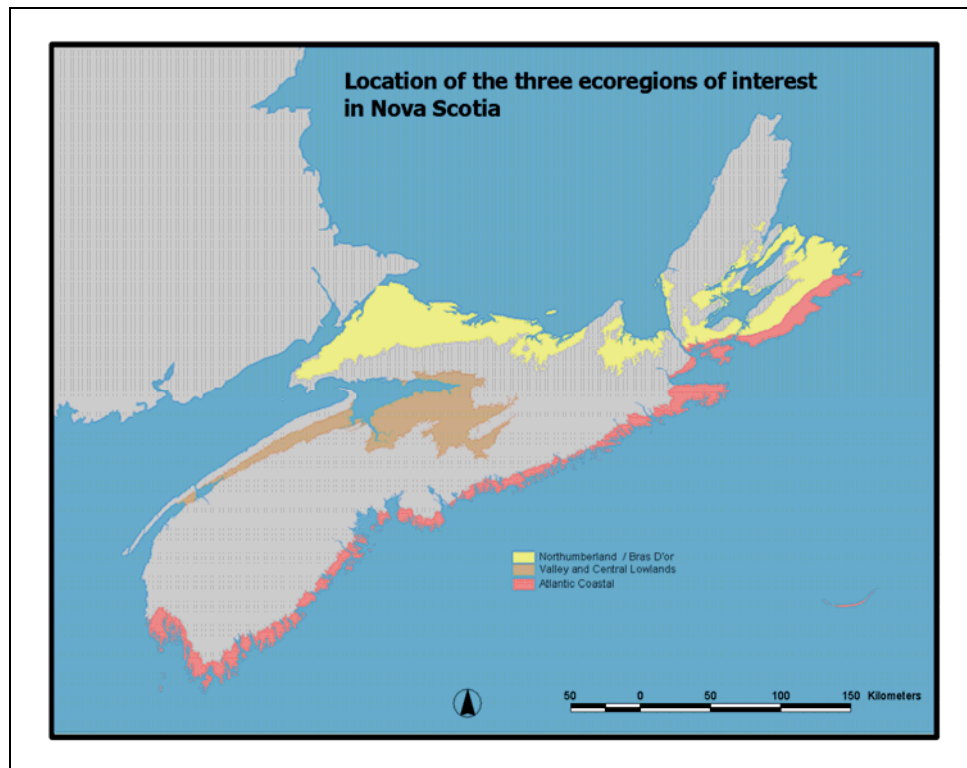


Figure 6. NS-EHJV Priority Ecoregions

Table 14. NS-EHJV Priority Ecoregions.

ECOREGION	SIZE (HA)	% OF PROVINCIAL AREA	COASTLINE LENGTH (KM)	% OF THE PROVINCIAL COASTLINE
Valley and Central Lowlands	406,786	7.5 %	531	4.9 %
Northumberland and Bras d'Or Lowlands	839,394	14 %	2,552	23.8
Atlantic Coastal	469,039	10 %	6,093	56.9
TOTAL	1,715,219 ha	31.5 %	9,176 km	85.7 %

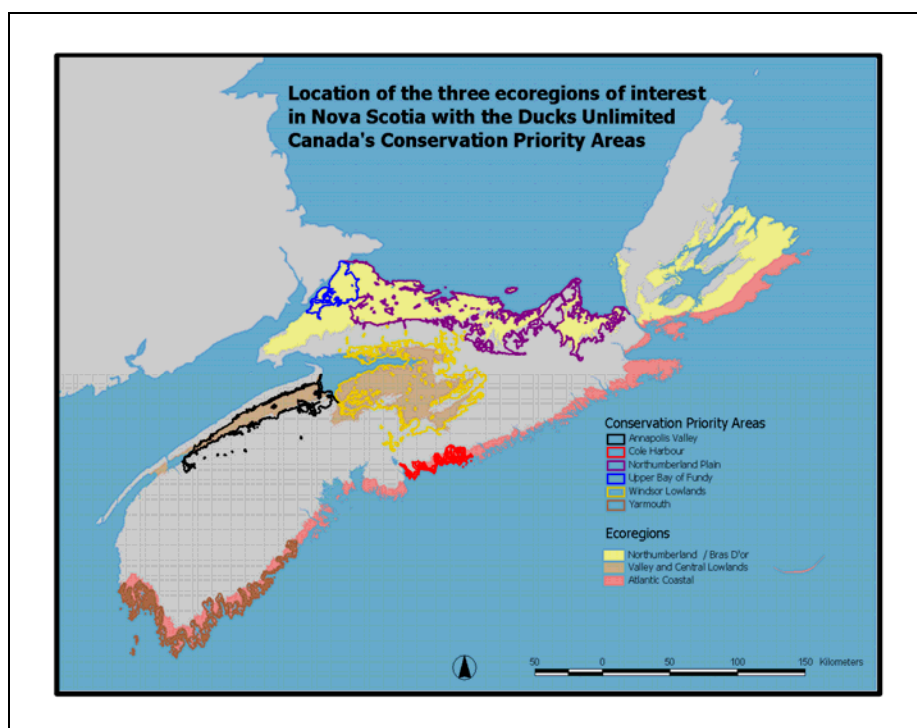


Figure 7. DUC Conservation Priority Areas for Nova Scotia overlapped with NS-EHJV Priority Ecoregion.

NCC Ecoregional Blueprint for the Northern Appalachian/Acadian Ecoregion:

NCC recently completed an Ecoregional Blueprint for the Northern Appalachian/Acadian Ecoregion, which includes all of Nova Scotia. Their findings indicate that marine and freshwater wetland ecosystems in the area are under significant pressure from development. The blueprint highlighted that much of the critical coastal and wetland habitats in the area are privately owned, and that relatively few expanses of significant wetland systems are protected. The blueprint highlighted wetland conservation as a priority activity for the Northern Appalachian/Acadian Ecoregion.

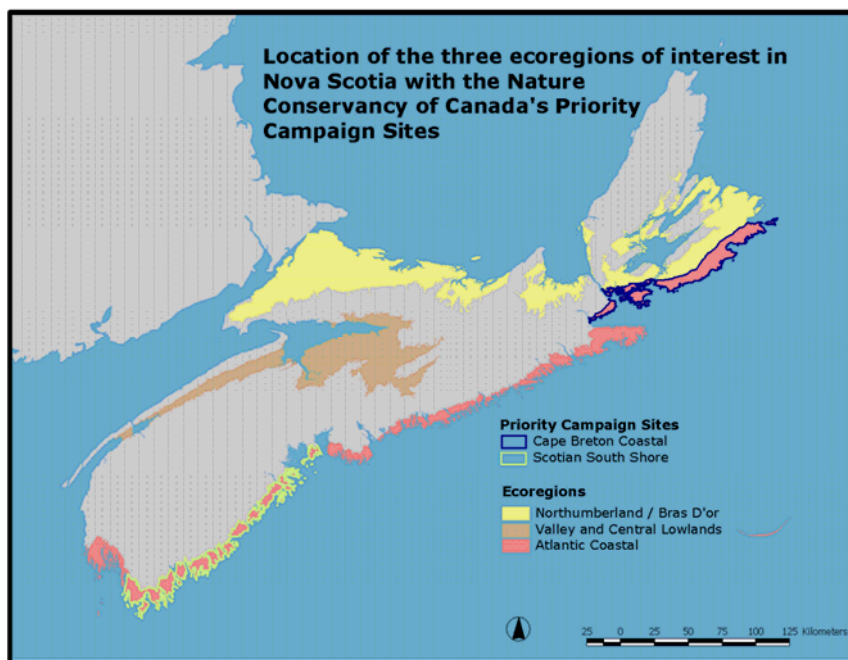


Figure 8. NCC Priority Campaign Sites for Nova Scotia overlapped with NS-EHJV Priority Ecoregions.

VALLEY & CENTRAL LOWLANDS ECOREGION

Description – Adopted from ELC at <http://www.gov.ns.ca/natr/forestry/ecosystem/elcpg1.htm>

The Valley & Central Lowlands Ecoregion includes the Annapolis Valley, the watersheds of the Minas Basin and the Musquodoboit Valley. The elevation of this lowland seldom exceeds 50 m above sea level, with only a few points reaching 100 m above sea level. Triassic sandstones underlie the Annapolis Valley and Minas shore portions of the Ecoregion, while Carboniferous shale, sandstone, gypsum and limestone underlie the lowlands within Hants, Halifax and Colchester Counties. Locally, in the areas underlain by gypsum, karst topography with sinkholes and caves can be expected. Very coarse to moderately coarse sandy soils occupy much of the Annapolis Valley and along the Minas shore. Otherwise, imperfectly drained, fine textured soils predominate on the gently undulating to moderately rolling plains of the central river watersheds of Shubenacadie, Stewiacke, Kennetcook, Avon, St.Croix and Musquodoboit. Excluding the latter, all these rivers are influenced by the tides of the Bay of Fundy and muddy tidal flats extend inland for considerable distance. Another significant landform feature of the Ecoregion are the extensive bogs in central Hants County. Notable bogs include the Collins and McDonald bogs both of which exceed 400 ha. Poorly drained clay loams underlay most of this area.

Land Ownership

Approximately 90 % of the property in this Ecoregion is under private ownership (Figure 9). Most of the Crown land (Provincial and Federal) of this Ecoregion exists in the forest landscape. Over 99% of the agricultural landscape and 98% of the coastal landscape area in this Ecoregion is under private ownership.

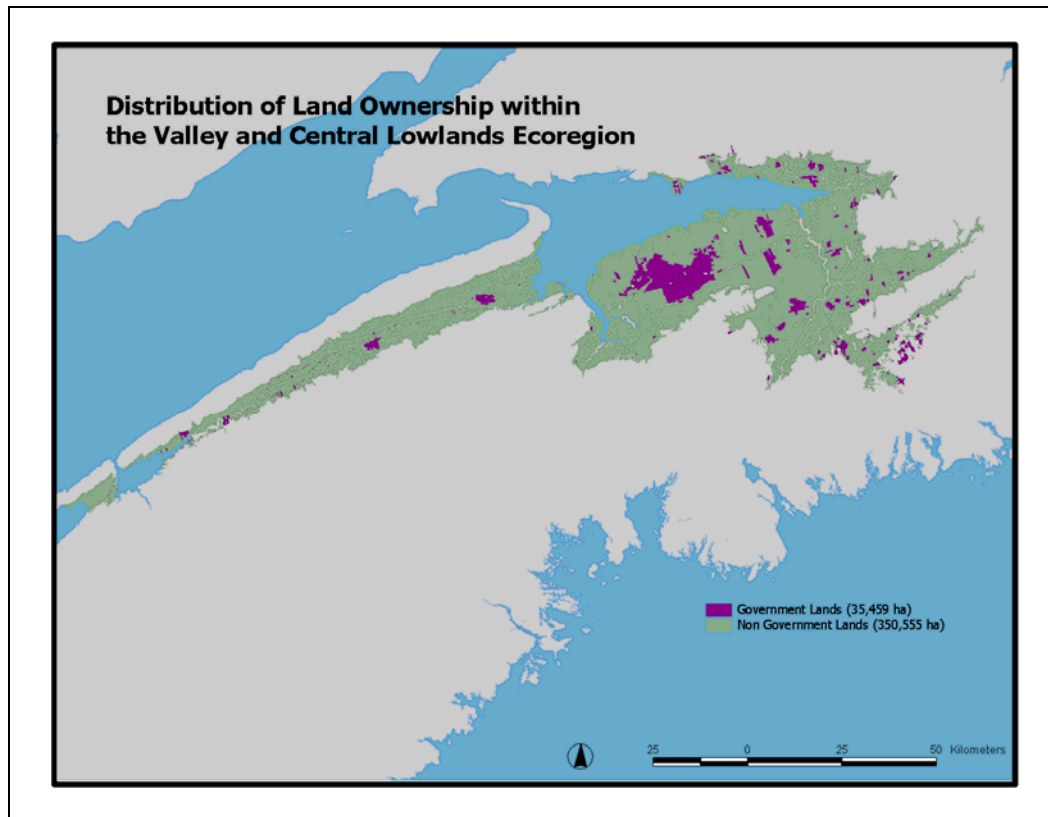


Figure 9. Land Ownership within the Valley and Central Lowlands Ecoregion.

Freshwater Wetlands

Freshwater wetland habitat for this Ecoregion includes deep marsh, shallow marsh, seasonally flooded flats, meadow, shrub swamp, wooded swamp, lakeshore wetland, bog and fen (Table 15). A total of 19,913 ha of freshwater wetlands exist in this Ecoregion, representing only 2% of the total freshwater wetland habitat in the province. However, it is important to note that close to one quarter (24.44%) of the shallow marsh habitat and 14.41% of the deep marsh for Nova Scotia exists in this Ecoregion – highlighting the importance of this area for breeding waterfowl.

Table 15. Freshwater Wetlands for Ecoregion 6 - Valley and Central Lowlands - NSDNR Data.

FRESHWATER WETLANDS	SIZE (HA)	PERCENT OF ECOREGION *	PERCENT OF PROVINCAL WETLAND TYPE **
Deep Marsh	1,221	0.30%	14.41%
Shallow Marsh	209	0.05%	24.44%
Seasonally Flooded Flats	2,667	0.66%	36.25%
Meadow	1,672	0.41%	45.42%
Shrub Swamp	5,479	1.35%	14.42%
Wooded Swamp	90	0.02%	7.83%
Lakeshore Wetland	174	0.04%	1.95%
Bog	6,879	1.69%	3.02%
Fen	1,522	0.37%	2.51%
TOTAL	19,913	4.89%	

* This is the percentage of area cover that a wetland type has in the Ecoregion (e.g. Deep Marsh represents 0.3 % of the total area cover of this Ecoregion).

** The percentage of wetland type occurring in the province that is located in this Ecoregion (e.g. 14.41 % of all Deep Marsh habitat in the province exist in this Ecoregion).

Coastal Wetlands

Coastal wetlands for this Ecoregion include salt marsh, estuarine flats and marine flats (Table 16). A total of 29,742 ha of coastal wetlands exist in this Ecoregion, representing 5.5 % of the total coastal wetland habitat in the province. It is important to note that 21.89% of all salt marsh for the province exist in this Ecoregion.

Table 16. Coastal Wetlands for the Valley and Central Lowlands Ecoregion - NSDNR Data.

COASTAL WETLANDS	SIZE (HA)	PERCENT OF ECOREGION	PERCENT OF PROVINCIAL WETLAND TYPE **
Salt Marsh	3,743	0.92%	21.89%
Saline Ponds	0	0	0
Estuarine Flat	9,823	2.41%	18.90%
Marine Flat	16,176	3.98%	11.19%
TOTAL	29,742	7.31%	

* This is the percentage of area cover that a wetland type has in the Ecoregion (e.g. Salt Marsh represents 0.92 % of the total area cover of this Ecoregion).

**The percentage of wetland type occurring in the province that is located in this Ecoregion (e.g. 21.89 % of all Salt Marsh habitat in the province exist in this Ecoregion).

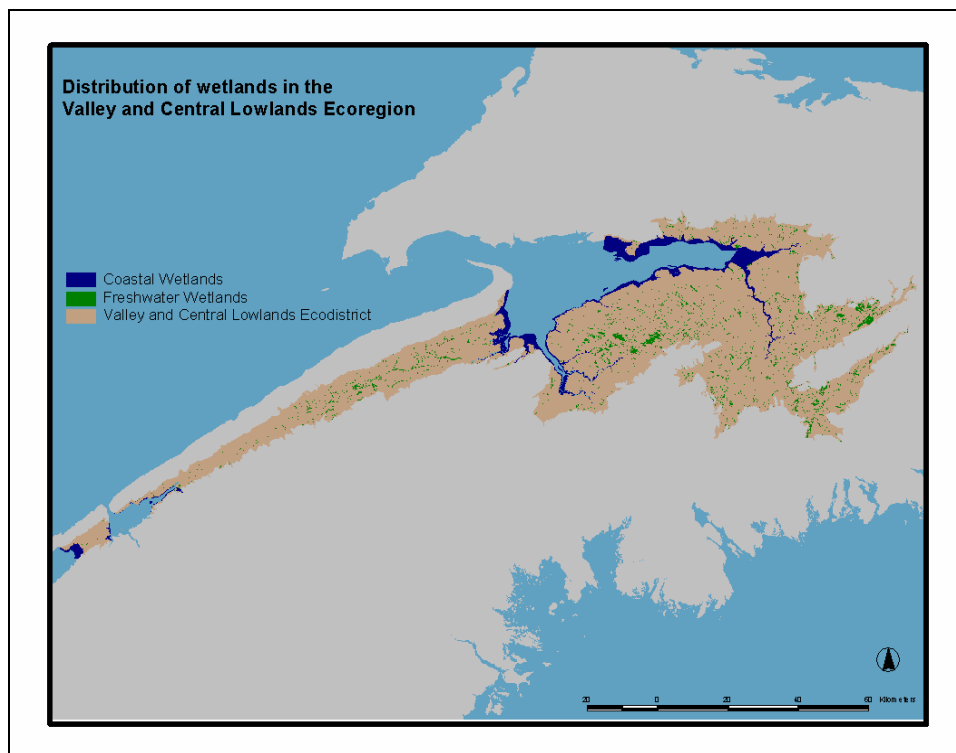


Figure 10. Distribution of Freshwater and Coastal Wetlands within the Valley and Central Lowlands Ecoregion.

Agricultural Land Use

Over 84,000 hectares of agricultural lands in the region represent approximately 36% off all agricultural lands in Nova (Table 17). Approximately one fifth of the land cover in the Ecoregion is made up of agricultural lands – making it the largest agricultural region in the province. These agricultural lands exist primarily in the Annapolis Valley and the lowland areas along the major rivers in the upper Bay of Fundy. The fertile soil and warm summers has resulted in intensive agricultural production of vegetables, fruit and forage to support the with intensive livestock operations.

Table 17. Agricultural land for Ecoregion 6 - Valley and Central Lowlands

TOTAL AMOUNT OF AGRICULTURE LANDS (HA)	PERCENT OF ECOREGION	PERCENT OF AGRICULTURE LAND IN THE PROVINCE
84,633	20.84%	36.16%

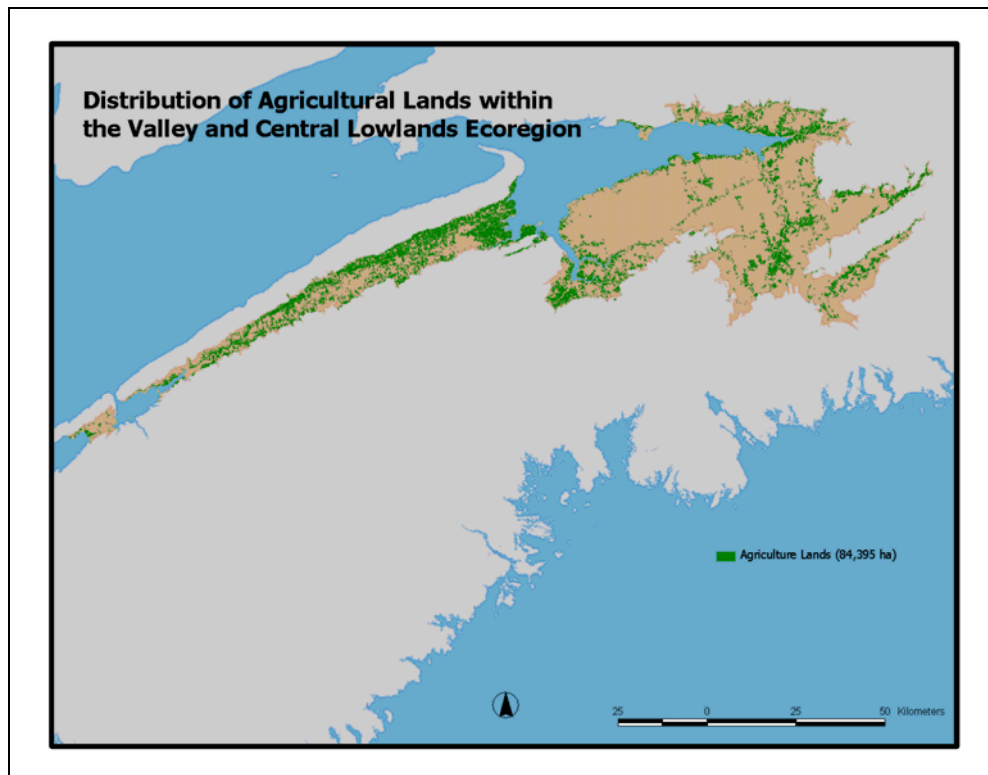


Figure 11. Distribution of Agricultural Lands within the Valley and Central Lowlands Ecoregion.

NORTHUMBERLAND BRAS D'OR LOWLANDS

Description – Adopted from ELC at <http://www.gov.ns.ca/natr/forestry/ecosystem/elcpg1.htm>

Following the Northumberland Shore from the New Brunswick border to Port Hastings and bordering the shores of the Bras d'Or Lakes through to the Sydney coalfield, this lowland Ecoregion occupies a significant area in eastern and northern Nova Scotia. This Ecoregion includes the rolling hills of Antigonish County, where elevations exceeding 150 m above sea level are common. However, the majority of the Ecoregion is relatively low lying, with a range of elevations between 25-50 m above sea level common along the Northumberland Strait and the Bras d'Or Lakes. The Ecoregion is underlain by readily erodable Carboniferous sandstone, shale, limestone and gypsum. Where bedrock is Windsor Group limestone and gypsum, karst topography is common and sinkholes constitute a geo-hazard on some eco-sections. The soils of the Ecoregion range from well drained, moderately coarse to medium textured alluviums (sandy loams) common near Oxford, Pictou and Heatherton to the fine textured glacial tills (sandy clay loams) that predominate along the Bras d'Or Lakes and in northern Cumberland County. As well, large areas of imperfectly to poorly drained, moderately coarse to medium textured soils are common in the Ecoregion. The soil drainage on these sites has been restricted due to a compacted basal till.

Land Ownership

Approximately 84 % of the property in this Ecoregion is under private ownership (Figure 12). Most of the Crown land of this Ecoregion exists in the forest landscape. Very little Crown land exists in the coastal and agricultural landscape. Over 99% of the agricultural landscape and 94% of the coastal landscape area in this Ecoregion is under private ownership.

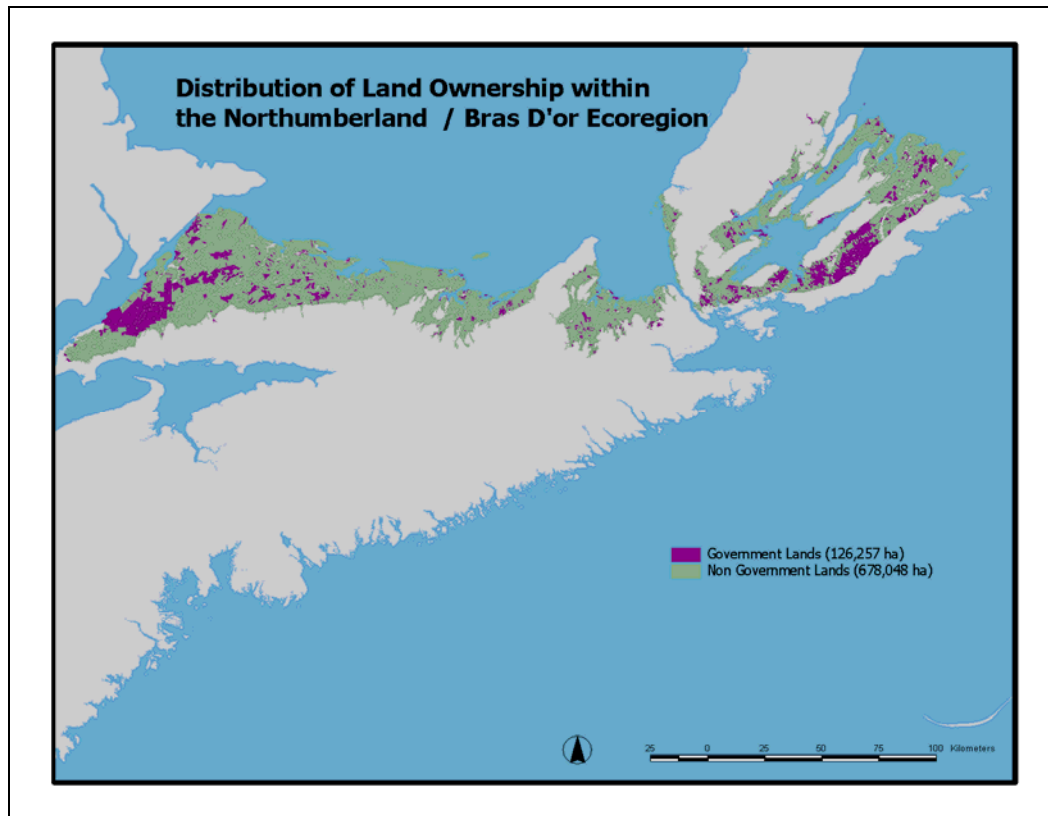


Figure 12. Land Ownership within the Northumberland / Bras d'Or Ecoregion.

Freshwater Wetlands

Freshwater wetland habitat for this Ecoregion includes deep marsh, shallow marsh, seasonally flooded flats, meadow, shrub swamp, wooded swamp, lakeshore wetland, bog and fen (Table 18). A total of 49,170 ha of freshwater wetlands exist in this Ecoregion, representing 5.6% of the total freshwater wetland habitat in the province. It is important to note that over one half (54.34%) of the deep marsh habitat and 43.04% of the shallow marsh for Nova Scotia exists in this Ecoregion – highlighting the importance of this area for breeding waterfowl.

Table 18. Freshwater Wetlands in the Northumberland/Bras d'Or Ecoregion - NSDNR Data.

FRESHWATER WETLANDS	SIZE (HA)	PERCENT OF ECOREGION *	PERCENT of PROVINCIAL WETLAND TYPE **
Deep Marsh	4,605	0.55%	54.34%
Shallow Marsh	368	0.04%	43.04%
Seasonally Flooded Flats	1,242	0.15%	16.89%
Meadow	447	0.05%	12.14%
Shrub Swamp	10,955	1.31%	28.83%
Wooded Swamp	288	0.03%	25.07%
Lakeshore Wetland	471	0.06%	5.27%
Bog	24,662	2.94%	10.81%
Fen	6,131	0.73%	10.10%
Total	49,170	5.86%	

* This is the percentage of area cover that a wetland type has in the Ecoregion (e.g. Deep Marsh represents 0.55 % of the total area cover of this Ecoregion).

** The percentage of wetland type occurring in the province that is located in this Ecoregion (e.g. 54.34 % of all Deep Marsh habitat in the province exist in this Ecoregion).

Coastal Wetlands

Coastal wetlands for this Ecoregion include salt marsh, saline ponds, estuarine flats and marine flats (Table 19). A total of 62,423 ha of coastal wetlands exist in this Ecoregion, representing 11.6 % of the total coastal wetland habitat in the province. It is important to note that this region has over 30% of the provinces total area of saline ponds, estuarine flats and marine flats. It is also important to note that a significant portion (24.04%) of Nova Scotia's salt marsh exist in this region.

Table 19. Coastal Wetlands in the Northumberland / Bras d'Or Ecoregion - NSDNR Data.

COASTAL WETLANDS	SIZE (HA)	PERCENT OF ECOREGION *	PERCENT of PROVINCIAL WETLAND TYPE **
Salt Marsh	4,111	0.49%	24.04%
Saline Ponds	1,426	0.17%	31.69%
Estuarine Flat	17,486	2.08%	33.65%
Marine Flat	44,400	5.29%	30.72%
Total	62,423	8.03	

* This is the percentage of area cover that a wetland type has in the Ecoregion (e.g. Salt Marsh represents 0.49 % of the total area cover of this Ecoregion).

**The percentage of wetland type occurring in the province that is located in this Ecoregion (e.g. 24.04 % of all Salt Marsh habitat in the province exist in this Ecoregion).

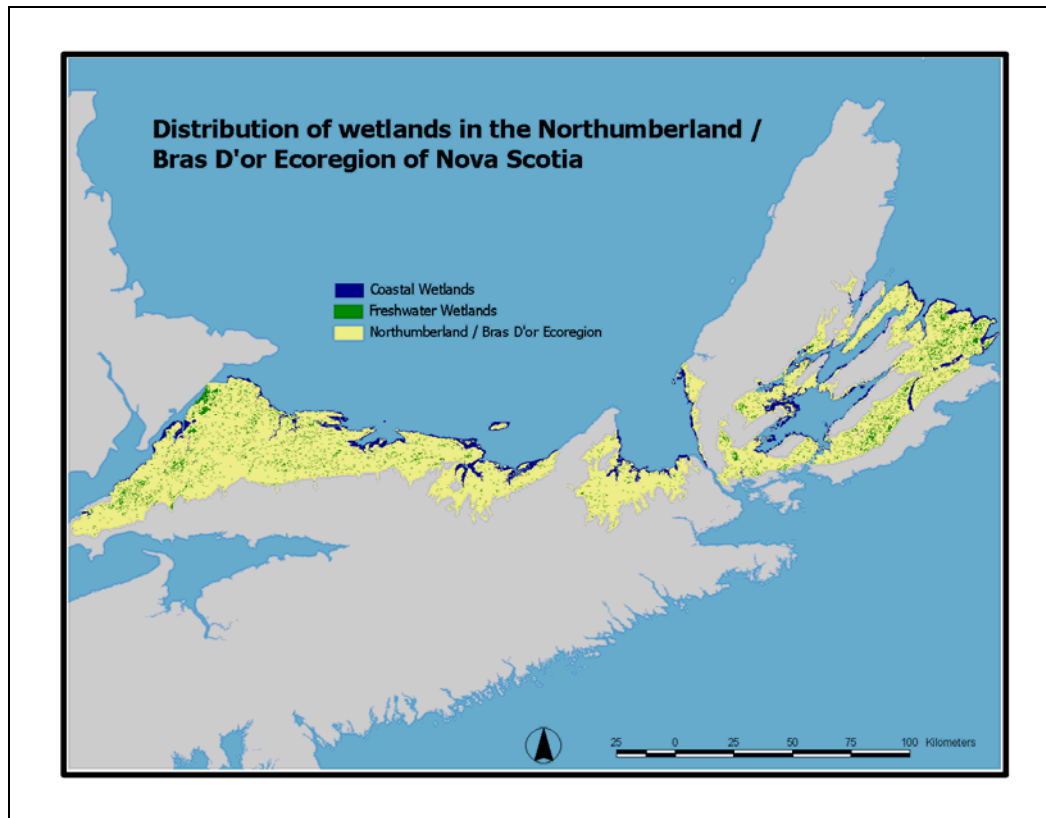


Figure 13. Distribution of Freshwater and Coastal Wetlands within the Northumberland/ Bras d'Or Ecoregion.

Agricultural Land Use

Over 69,000 hectares of agricultural lands in the region represent approximately 29% of all agricultural lands in Nova (Table 20). Less than one tenth (~ 9%) of the land cover in the Ecoregion is made up of agricultural lands.

Table 20. Agricultural lands in the Northumberland / Bras d'Or Ecoregion

TOTAL AMOUNT OF AGRICULTURE LANDS (HA)	PERCENT OF ECOREGION	PERCENT OF AGRICULTURE LAND IN THE PROVINCE
69,643	9.14%	29.76%

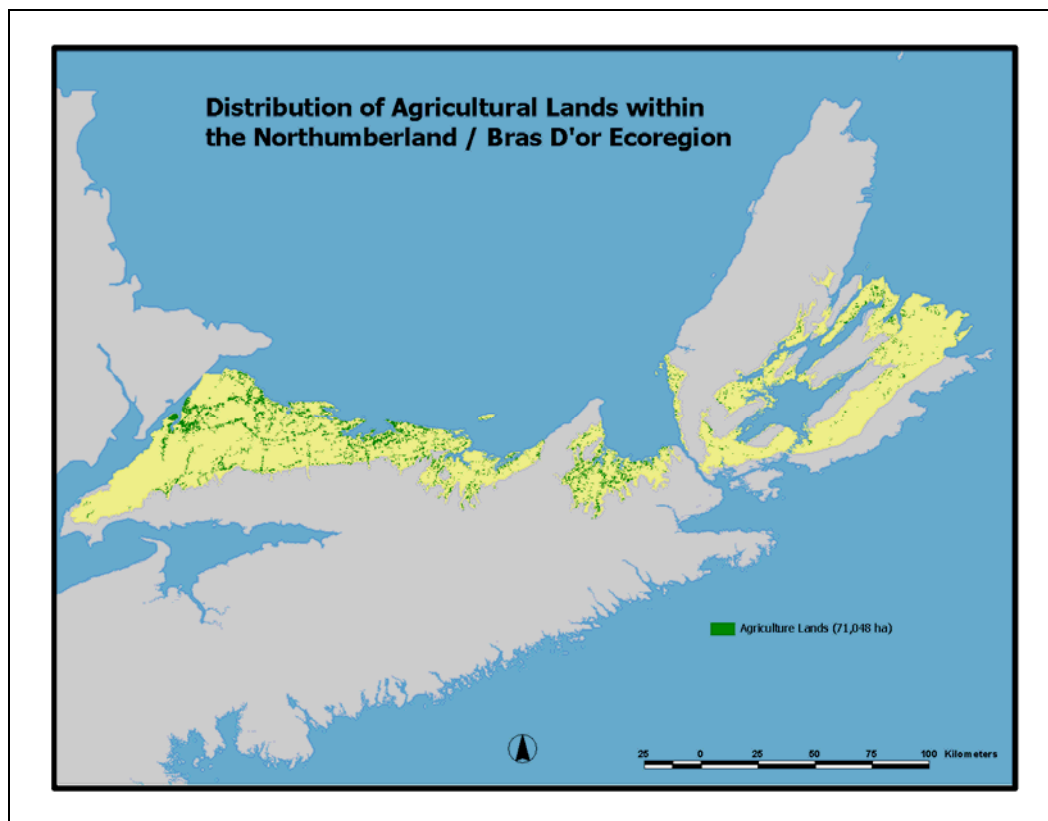


Figure 14. Distribution of Agricultural Lands within the Northumberland/ Bras d'Or Ecoregion.

ATLANTIC COASTAL ECOREGION

Description – Adopted from ELC at <http://www.gov.ns.ca/natr/forestry/ecosystem/elcpg1.htm>

This Ecoregion extends along the Atlantic coast of the province from Yarmouth to Scatarie Island. The Atlantic Coastal Ecoregion seldom exceeds five km in width, except along the Cape Breton shoreline where the coastal influence can extend almost 20 km inland. In areas where bays, coves and rivers are indented inland for several kilometers from the ocean, for example, Mahone Bay, Shelburne Harbour, and Country Harbour, the effect of the coastal climate can be reduced or eliminated. The inland boundary of the Ecoregion is more defined by the absence of certain vegetational species than by a geo-physical attribute. However, in some portions of the Ecoregion, rising uplands (Mira Hills) and coastal islands (Clam Bay to Liscombe Point) reduce the influence of the coast further inland. The underlying geology is quite varied because of the extent of this Ecoregion. However, since most of it is comprised of the lower elevations of the tilting Appalachian peneplain, the bedrock is predominately granite, quartzite or slate on the mainland. The Chedabucto Bay area is underlain by carboniferous sedimentary rocks. Along the east coast of Cape Breton Island, older precambrian rocks underlie the Ecoregion. The soils of the Ecoregion for the most part are thin and stony. However, thicker tills are found where drumlins extend into the Ecoregion. Particularly in the east, significant portions of the Ecoregion are covered with deep organic soils that have developed on flat or level topography where drainage has been impeded and the cool moist climate has favoured the development of the peat material. In areas where deeper sandy materials occur, a hardpan formation (also known as an ortstein layer) will be found restricting drainage and creating thick humus layers under forest stands.

Land Ownership

Approximately 69% of the property in this Ecoregion is under private ownership (Figure 15). Over 99% of the agricultural landscape and 82% of the coastal landscape area in this Ecoregion is under private ownership.

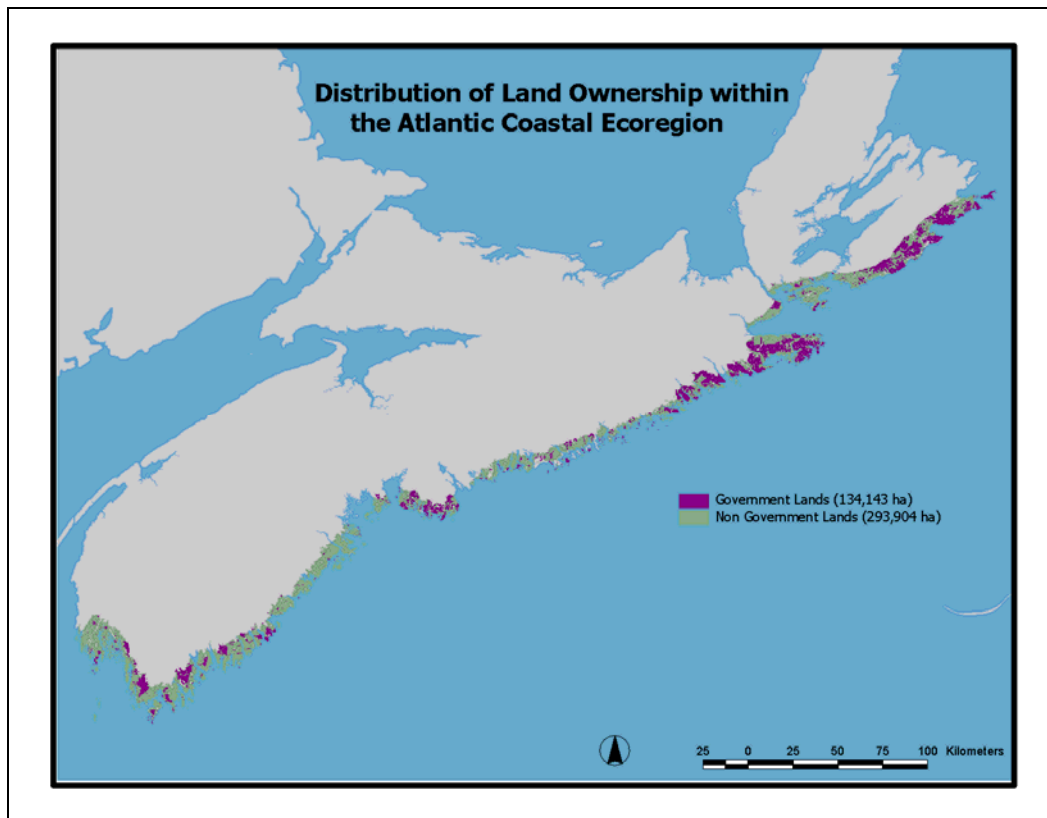


Figure 15. Land Ownership within the Atlantic Coastal Ecoregion.

Freshwater Wetlands

Freshwater wetland habitat for this Ecoregion includes deep marsh, shallow marsh, seasonally flooded flats, meadow, shrub swamp, wooded swamp, lakeshore wetland, bog and fen (Table 21). A total of 52,518 ha of freshwater wetlands exist in this Ecoregion, representing 5.9% of the total freshwater wetland habitat in the province. The most common wetland in this Ecoregion is bog, which covers approximately 9% of the Ecoregion and represents over 18% of the area of all bog habitat in Nova Scotia.

Table 21. Freshwater Wetlands for the Atlantic Coastal Ecoregion - NSDNR Data.

FRESHWATER WETLANDS	SIZE (HA)	PERCENT OF ECOREGION *	PERCENT of PROVINCIAL WETLAND TYPE **
Deep Marsh	402	0.09%	4.74%
Shallow Marsh	83	0.02%	9.71%
Seasonally Flooded Flats	161	0.03%	2.19%
Meadow	86	0.02%	2.34%
Shrub Swamp	1257	0.27%	3.31%
Wooded Swamp	49	0.01%	4.26%
Lakeshore Wetland	1069	0.23%	11.97%
Bog	42,407	9.04%	18.59%
Fen	7,004	1.49%	11.54%
Total	52,518	11.38%	

* This is the percentage of area cover that a wetland type has in the Ecoregion (e.g. Deep Marsh represents 0.09 % of the total area cover of this Ecoregion).

** The percentage of wetland type occurring in the province that is located in this Ecoregion (e.g. 4.74 % of all Deep Marsh habitat in the province exist in this Ecoregion).

Coastal Wetlands

Coastal wetlands for this Ecoregion include salt marsh, saline ponds, estuarine flats and marine flats (Table 22). A total of 90,465 ha of coastal wetlands exist in this Ecoregion, representing 16.8 % of the total coastal wetland habitat in the province. Approximately one half (47.05%) of the provinces salt marsh and 63.07% of the provincial saline pond area exist in this Ecoregion.

Table 22. Coastal Wetlands for the Atlantic Coast Ecoregion - NSDNR Data.

COASTAL WETLANDS	SIZE (HA)	PERCENT OF ECOREGION *	PERCENT of PROVINCIAL WETLAND TYPE **
Salt Marsh	8,045	1.72%	47.05%
Saline Ponds	2,838	0.61%	63.07%
Estuarine Flat	22,154	4.72%	42.63%
Marine Flat	57,429	12.24%	39.73%
Total	90,465	19.29%	

* This is the percentage of area cover that a wetland type has in the Ecoregion (e.g. Salt Marsh represents 1.72 % of the total area cover of this Ecoregion).

**The percentage of wetland type occurring in the province that is located in this Ecoregion (e.g. 47.05 % of all Salt Marsh habitat in the province exist in this Ecoregion).

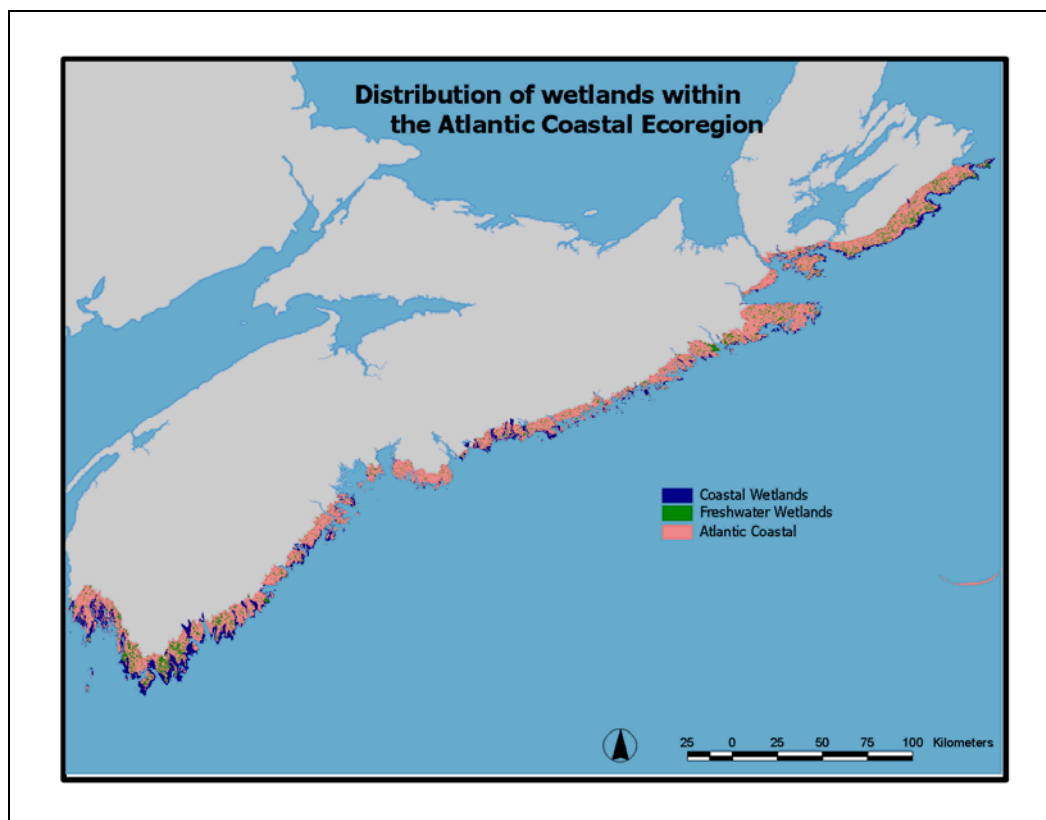


Figure 16. Distribution of Freshwater and Coastal Wetlands within the Atlantic Coastal Ecoregion.

Agricultural Land Use

Less than 4,000 hectares of agricultural lands exists in the region - representing only 1.65% of all agricultural lands in Nova (Table 23). Less than one percent ($\sim 0.74\%$) of the land cover in the Ecoregion is made up of agricultural lands.

Table 23. Agricultural lands in the Atlantic Coastal Ecoregion

TOTAL AMOUNT OF AGRICULTURE LANDS (HA)	PERCENT OF ECOREGION	PERCENT OF AGRICULTURE LAND IN THE PROVINCE
3,851	0.74%	1.65%

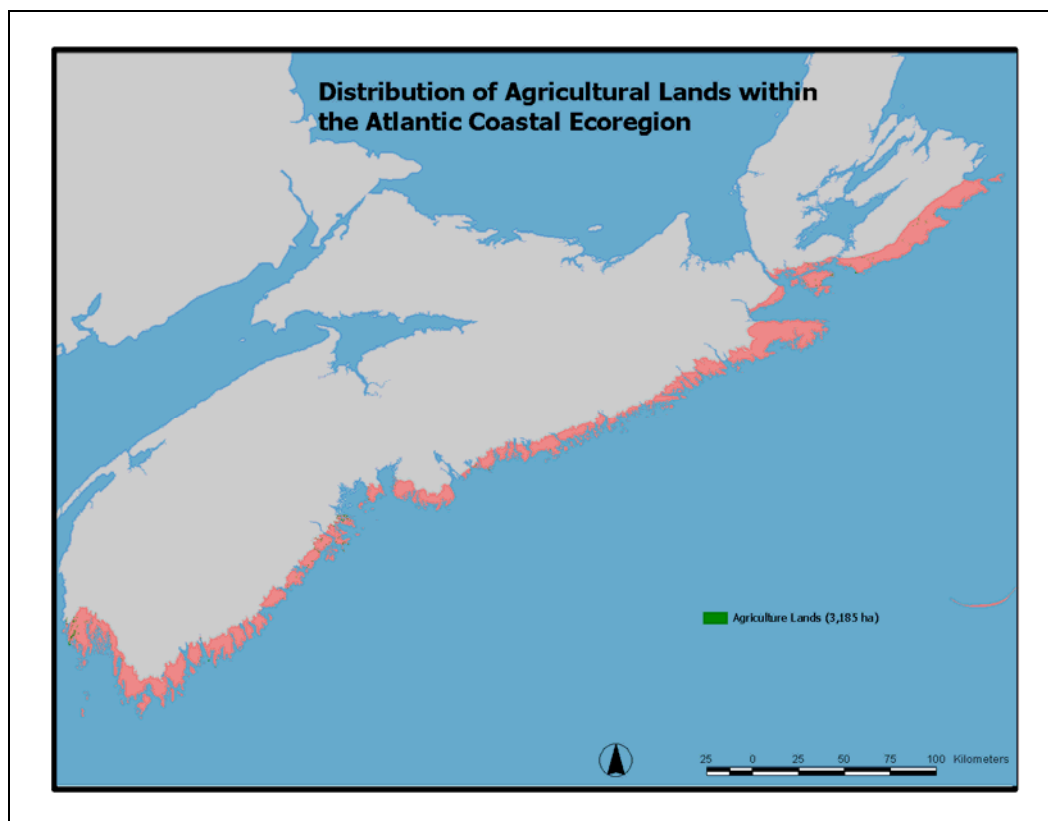


Figure 17. Distribution of Agricultural Lands within the Atlantic Coastal Ecoregion.

CONSERVATION ACTIONS

SECUREMENT

In 2000, the NS-EHJV partners provided information to help determine the geographical locations for priority securement activities in Nova Scotia. The partners identified priority securement areas based on: winter, migration, brood and staging waterfowl value; potential threats and risks to habitat; land use activities and conservation areas; habitat type; species at risk use; overall wildlife use; and land ownership.

In total, twelve areas (Figure 18) were identified as priority securement areas for the Coastal KPA of Nova Scotia:

- Amherst - Chignecto
- Wallace Bay
- Tatamagouche - John Bay
- Pictou - Merigomish
- St. Georges Bay
- Canso Islands
- Cole Harbour - Jeddore Harbour
- Shelbourne Harbour - Keji. Adjunct
- Cape Sable Island - Yarmouth
- St. Marys Bay - Annapolis Basin
- Minas Basin
- Cobequid Bay

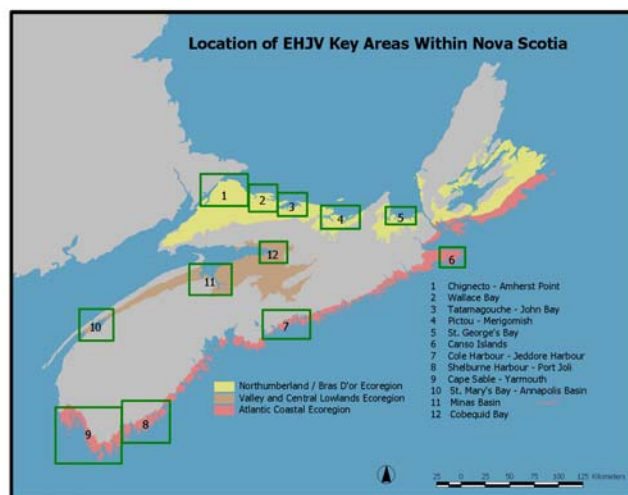


Figure 18. NS-EHJV Priority Securement Areas.

Securement Priorities

Approximately 95% of coastal lands in Nova Scotia are privately owned. Land securement for the NS-EHJV will involve fee simple acquisitions, owners unknown acquisitions and conservation agreements on private land holdings that have valuable waterfowl habitats.

Habitat securement priorities for the NS-EHJV include:

- Coastal Islands - particularly islands with breeding populations of common eider and other colonial nesting bird.
- Salt marsh – particularly large contiguous parcels.

- Private in-holdings within coastal management areas and sanctuaries

Fee Simple Acquisition

The EHJV partners (NSDNR, DU and NCC) have acquired 267 land parcels totaling over 5,000 hectares in Nova Scotia to date (Table 24).

Table 24. Nova Scotia EHJV Land Acquisitions to Date in Priority Ecoregions		
Ecoregion	# of parcels	Ha
Atlantic Coastal	111	2,933
Northumberland / Bras d'Or	91	1,826
Valley and Central Lowlands	65	616
Total	267	5,375

The NS-EHJV fee simple acquisition activities will focus on: 1) securing privately owned coastal islands along the Atlantic Coastal Ecoregion that have known breeding populations of common eider; 2) securing large tracts of privately owned salt marsh that provide wintering and staging habitats for American black duck, mallard, green-winged teal, and Canada goose and; 3) securing private coastal properties within existing and proposed Migratory Bird Sanctuaries and Wildlife Management Areas that exist along the Atlantic Coastal Ecoregion that provide wintering and staging habitats for American black duck, mallard, green-winged teal, and Canada goose.

1) Coastal Islands

Nova Scotians have a strong cultural connection to coastal islands. Many islands continue to be visited frequently by people living in coastal communities and they have long been recognized as protected havens for lost or shipwrecked fishermen and mariners traveling along the coast. There are thousands of islands scattered along Nova Scotia's coast that provide habitat for many nesting and migrating seabirds, waders and songbirds. The common eider is the only NS-EHJV key waterfowl species that nest exclusively on coastal islands. Every spring, thousands of common eider migrate to the coastal shores of Nova Scotia Atlantic Coastal Ecoregion to build nest on remote islands that are relatively free of predators and human interference. After nesting, the hens lead their young to the shallow water that surround the islands and form large groups called crèches. During this time the eider feed on the small mollusk and crustaceans that inhabit these rich coastal waters.

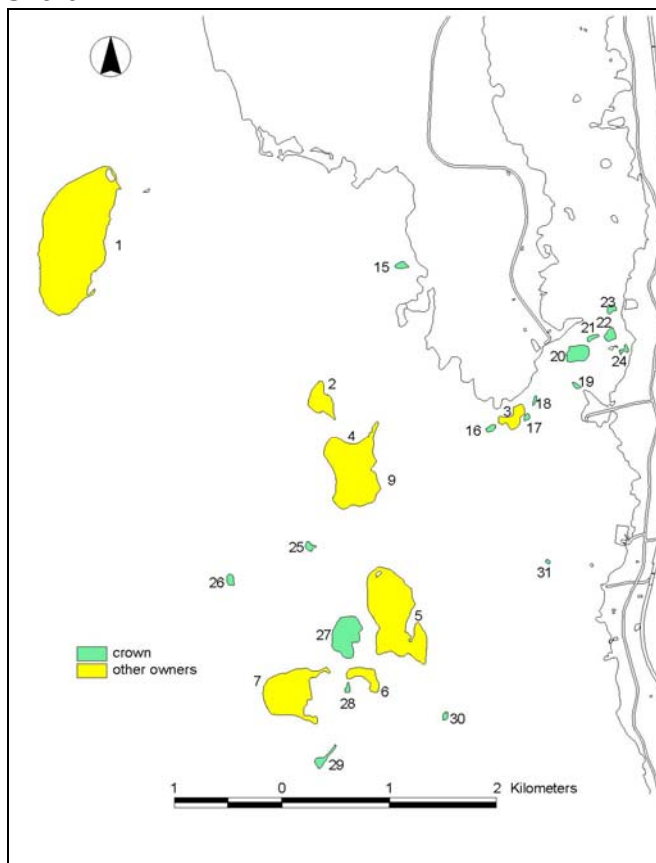
Biological inventories have not been conducted on most coastal islands in Nova Scotia. However, NSDNR has conducted various surveys and banding operations on many islands known to have colonial breeding birds. Currently there are 83 coastal islands located along the Atlantic Coastal Ecoregion that have records of common eider nesting activities (NSDNR Significant Species and Habitats Database). Thirty-five of these islands are located exclusively on provincial Crown land and 48 are either fully or partially under private ownership. Only twenty-four (15 Crown; 9 private) of the known 83 eider islands are located within provincial Wildlife Management Areas that have regulations to prohibit public access to prevent disturbing breeding birds from April 1 – August 15 each year.

The market value of coastal island throughout Nova Scotia is variable and can range from several hundreds dollars per hectare to thousands of dollars per hectare. Recent coastal island acquisitions by the EHJV occurred along the Eastern Shore in Halifax County for \$2,400/hectare. Pycles Island also in Halifax County, was recently acquired by the Nova Scotia Department of Natural Resources (NSDNR) for ~ \$3,000/hectare. Currently, a large portion of Seal Island (PID 90068404) in Shelburne County is for sale for ~ \$3,700/hectare. Bayers Island in Halifax County and Port Mouton Island (PID 70065578) in Queens County are both currently listed for sale on international markets for \$540,000 (~\$17,000/hectare) and \$11,000,000 (~\$27,000/hectare) respectively. There has been considerable foreign interest in the acquisition of Nova Scotia Islands in recent years. Nova Scotia coastal islands are still considered a “good bargain” compared to other islands located along the eastern seaboard of North America. Market values for Nova Scotia’s coastal islands are expected to rise considerably over the next decade. A projected value for future island purchases for the NS-EHJV should be estimated at \$4,000 - \$9,000/hectare.

Significant opportunities exist to acquire coastal islands important for common eider and other colonial nesting birds along the south shore of Nova Scotia. For example the area between Shag Harbour and Pubnico Harbour (~15 km) has many coastal islands that provide important habitats for many colonial nesting species (including common eider). These islands are also well positioned on the southern tip of Nova Scotia as important stopover sites for many migrants following the eastern edge of the Atlantic Flyway. There are twelve non-crown islands totaling ~640 hectares in this area. Seven of these islands are located inshore (Figure 19) and five are located offshore (greater

than 10 Kilometers from Shore). There is only one landowner on each of these islands with the exception of one island that has three major landowners. It is also interesting to note that some of these islands have foreign ownership (e.g. USA, Switzerland and Germany). The provincial Crown currently owns land on eighteen (18) islands in this area totaling ~ 18 hectares. The provincial Crown is the sole owner of seventeen inshore islands and owns a small portion of one offshore island. It is noteworthy that the Crown owns 60% of the total of islands in the area but, the land coverage of Crown land ownership for these islands represents only ~ 2% of the total land area.

Figure 19. Inshore Islands located between Shag Harbour and Pubnico Harbour on NS South Shore.



Action - Fee simple acquisition will be directed at securing up to 50% of the coastal islands located throughout the Atlantic Coast Ecoregion that have known nesting records of common eider. Thirty-five (35) of the 84 known common eider nesting islands are currently secured through Crown ownership – a 50% conservation target means the securement of an additional 7 privately owned

islands (estimated at 302 ha). This action will target islands that are estimated to support an estimated 40% of the breeding eider population (R. Milton pers. comm.).

2) Salt Marsh

Reports have estimated that over 60% of original salt marsh habitat within Nova Scotia have been drained since European settlement. Salt marshes provide wintering and staging habitats for several NS-EHJV key waterfowl species including American black duck, mallard, green-winged teal, and Canada goose. Salt marshes also provide habitats for many shorebirds (e.g. greater and lesser yellowlegs, least and pectoral sandpipers, dowitchers, and snipe). Nova Scotia's salt marsh and intertidal flats are believed to support the largest breeding concentration of willet in Eastern Canada.

The Nova Scotia Department of Environment and Labour Wetland Designation Policy (2006) identified salt marshes as critical ecosystems that provide environmental and social services. This policy added new safeguards towards saltmarsh conservation, however salt marshes are still at risk through human activities along Nova Scotia's coast.

Like most coastal areas, the market value of salt marsh is rising. Based on recent acquisitions of Nova Scotia salt marsh, a projected value for future salt marsh purchases for the NS-EHJV should be estimated at \$900 - \$1,200/hectare.

Approximately 28 large contiguous salt marshes (20ha+) with only one private landowner per marsh exist within the three NS-EHJV priority ecoregions (Table 25).

Table 25. Privately Owner Large Contiguous (20ha+) Salt Marshes With One Landowner.	
Ecoregion	Total Number of Privately Owned Large Contiguous Salt Marshes With One Landowner
Atlantic Coastal	19
Valley and Central Lowlands	8
Northumberland / Bras d'Or	1
TOTAL	28

Significant opportunities exist to acquire many of these large private salt marshes throughout Nova Scotia. For example, over 650 ha of privately owned salt marsh exists' along the Chebogue River (Figure 20), Yarmouth County. The Chebogue River estuary is an important coastal complex of salt marsh, saline ponds and, intertidal mud and sand flats. The relatively unimpacted salt marshes in this area are important sources of nutrient export to the estuary and marine zones. The eelgrass flats are widely distributed within the estuary and tidal creeks of the salt marshes are an important food item for American black duck, Canada geese and brant. The non- vegetated intertidal mudflats and beaches in the area are also home to tiny marine invertebrates and provide critical food to thousands of migrating waterfowl and shorebirds.

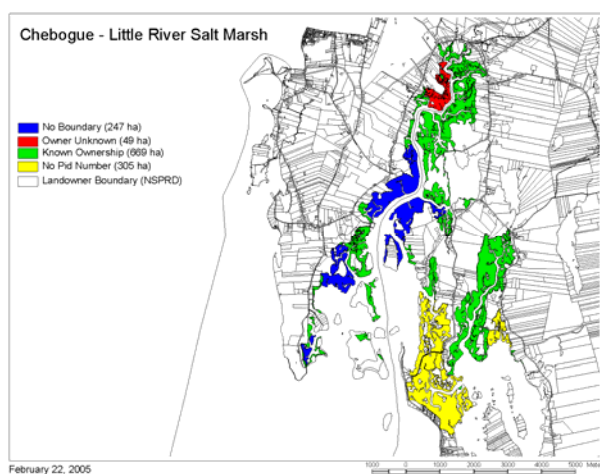


Figure 20. Salt Marsh along the Chebogue River

Action - Fee Simple Acquisition will be directed at securing ~35 % (~10 parcels= 200 ha) of the 28 remaining privately owned large contiguous salt marsh and associated upland located throughout the Atlantic Coast, Valley and Central Lowlands and Northumberland / Bras d'Or Ecoregions. This action will contribute to achieving the waterfowl population goals for Nova Scotia by maintaining present and future important brood rearing, staging and wintering habitat for American black duck, mallard, green-winged teal and Canada goose.

3) Private In-holdings

The Atlantic Coastal Ecoregion has several areas of restricted and limited land use that were established primarily for the conservation of coastal habitats. Many of these areas were established primarily for the conservation of waterfowl, other coastal birds and coastal wetlands (Table 26).

Table 26. Atlantic Coastal Ecoregion Coastal Conservation Areas designated to the Conservation of Waterfowl, other Coastal Birds and Coastal Wetlands
Blandford Provincial Game Sanctuary
Martinique Beach Provincial Game Sanctuary
Melbourne Lake Provincial Game Sanctuary
Haley Lake National Migratory Bird Sanctuary
Port L'Hebert National Migratory Bird Sanctuary
Port Joli National Migratory Bird Sanctuary
Sable River National Migratory Bird Sanctuary
Sand Pond National Wildlife Area
Scatarie Island Provincial Wildlife Management Area
Eastern Shore Islands Provincial Wildlife Management Area
Pearl Island Provincial Wildlife Management Area
Musquodoboit Harbour Outer Estuary Ramsar Site

NSDNR is also investigating the possibility of establishing three new Wildlife Management Areas along the Atlantic Coastal Ecoregion (Table 27) that will be managed to protect sensitive coastal habitats for waterfowl and other wildlife while providing recreational and educational opportunities for people.

Table 27. Proposed Wildlife Management Areas for the Atlantic Coastal Ecoregion
Cape Sable Island Wildlife Management Area
Peter McNab Kuhn Wildlife Management Area
Additions to the Eastern Shore Islands Wildlife Management Area

There are many private land holdings that currently exist within many coastal conservation areas. It is important that these private holdings be managed under the same context by which the conservation area was established. Human related development on these private holdings could disrupt the integrity of the conservation area and have a negative impact on coastal habitat and wildlife. The acquisition and management of private land holdings within these coastal conservation areas by the NS-EHJV partners will provide added protection to wildlife and habitats within coastal conservation areas and reduce negative impacts from un-controlled human related disturbances.

Action - Fee Simple Acquisition will be directed at securing 100 hectares of coastal private holdings within the coastal conservation areas of the Atlantic Coast Ecoregion. This action will contribute to achieving the waterfowl population goals for Nova Scotia by reducing the likelihood of human related disturbances to coastal habitats and maintaining important brood rearing, staging and wintering habitat for American black duck, mallard, green-winged teal and Canada goose.

Owners Unknown Acquisition

In Nova Scotia there are hundreds of land parcels with their title and ownership listed as "Owners/Owner Unknown" (OU) by Service Nova Scotia and Municipal Relations (SNS&MR). Many of these lands provide habitat for waterfowl and other wildlife including some of Nova Scotia's endangered or at-risk species. Nova Scotia's *Municipal Government Act* gives DNR the opportunity for first refusal of these lands in exchange for paying the back taxes owing to the municipality. In partnership with DUC through the EHJV, DNR secures parcels that have wetlands and coastal habitats important for conservation. To-date over 2,700 hectares have been acquired under the Owners Unknown Project.

Action - The Owners Unknown Acquisition Project will be directed at acquiring an additional 1,250 hectares of freshwater and coastal wetlands and coastal islands located primarily throughout the Valley and Central Lowlands, Northumberland and Bras d'Or Lowlands, and Atlantic Coast Ecoregion. This action will contribute to achieving the waterfowl population goals for Nova Scotia

by maintaining important brood rearing, staging and wintering habitat for American black duck, mallard and green-winged teal, Canada goose and common eider.

Donations

The partners in the NS EHJV are increasingly presented with opportunities to take land for a tax receipt. All lands considered must contain or protect wetland habitat. Preference will be given to lands within conservation priority areas. Lands outside of conservation priority areas must have significant quality wetland resources and will be reviewed on a case-by-case basis.

Action - Donations will be directed at acquiring an additional 350 hectares of freshwater and coastal wetlands and coastal islands located primarily throughout the Valley and Central Lowlands, Northumberland and Bras d'Or Lowlands, and Atlantic Coast Ecoregion. This action will contribute to achieving the waterfowl population goals for Nova Scotia by maintaining important brood rearing, staging and wintering habitat for American black duck, mallard and green-winged teal, Canada goose and common eider.

Conservation Agreements

Private landowner participating in DUC wetland restoration activities must enter into a land conservation agreement with DUC. DUC offers many types of land conservation agreements in Nova Scotia including: 1) Conservation easements/covenants, 2) Registered Conservation Agreements, 3) Unregistered Conservation Agreements, and 4) Management agreements. All DUC land conservation agreements will cover a minimum period of 10 years.

Action – Conservation Agreements will be signed on private land wetland restoration projects delivered over the next five years and will result in the securement of 1,735 ha of restored wetlands.

STEWARDSHIP

The EHJV defines stewardship as the responsibility to manage one's land use practices and activities with proper regard to the surrounding environment and the rights of others. NS-EHJV stewardship activities involving governments, landowners, interest groups and/or the general public are voluntary and promote cooperative conservation partnerships.

Stewardship projects involving individual landowners or partnerships also provide an excellent medium for wetland communications and education. By directly involving landowners, stewardship projects help to instill an appreciation of resource values in those who are ultimately entrusted with the proper management of the province's natural capital.

The goal of the NS-EHJV Stewardship Program is to address provincial wetland conservation and management needs through the development of conservation and stewardship objectives and the application of stewardship techniques.

The following general objectives are identified for the NS-EHJV Stewardship Program:

- Ensure that existing benefits to breeding, migratory and wintering waterfowl and other migratory birds, as well as benefits to other wildlife and people will be maintained on privately owned lands.
- Improve public understanding of wetland ecosystem services.
- Educate both the landowner and user in responsible land use practices.
- Undertake physical improvements on privately owned wetlands to benefit wetland associated wildlife species.

These objectives will be directed at protecting both wetland habitats and biodiversity in Nova Scotia, and communicating the critical ecological role of wetlands habitats.

Stewardship Priority

With nearly 99% of the agricultural landscape land base in Nova Scotia privately owned, a strong stewardship program that responds to current population /resource development pressures and trends is essential for the conservation of wetland habitats in this landscape.

The current priority of the NS-EHJV Wetland Stewardship Program is to facilitate partnerships with agricultural producers and practitioners to improve the conservation of wetland habitat in the agricultural landscapes located in the Valley and Central Lowlands and Northumberland and Bras d'Or Lowlands Ecoregion. The NS-EHJV Wetland Stewardship Program will contribute to achieving the waterfowl population goals for Nova Scotia by influencing positive land use practices to support and maintain critical breeding habitat for American black duck, mallard, green-winged teal, ring-necked duck and Canada goose.

Agricultural Landscape – Stewardship Vision

The agricultural landscape of Nova Scotia has changed over time. Today approximately 3,900 registered farms (Statistics Canada) employ intense farming practices on approximately 4% (234,000 ha) of the provincial land base. These farms account for cash receipts in excess of \$453,000,000 (Statistics Canada).

Extensive wetland loss has occurred in many agricultural regions and small-scale drainage and wetland infilling continues today. Historically, land use practices in the agricultural landscape have also resulted in the loss of riparian edges, a reduction in the quality of surface waters, and bank erosion that has had a negative effect on wetlands and dependent wildlife including breeding waterfowl. However, the rich fertile soils and high primary productivity continues to make the agricultural landscape a priority breeding area for many waterfowl.

The NS-EHJV Wetland Stewardship Program's vision for the agricultural landscape is a working landscape with its wetlands and riparian habitats conserved or restored in order to provide multiple societal and environmental benefits including improved wetland quality and quantity and biodiversity conservation.

Agricultural Biodiversity Conservation Planning

Nova Scotia farmers and agricultural practitioners are increasingly becoming aware and interested in habitat conservation and biodiversity related issues. This is, in part, due to the federal governments 2003 Agricultural Policy Framework (APF - http://www.agr.gc.ca/cb/apf/index_e.php) that aims

to position Canada as the world leader in food safety, innovation and environmentally responsible agricultural production.

Under the APF, farmers are now eligible to apply for financial and technical assistance to implement beneficial management practices that provide benefits to biodiversity including the conservation of wetland. However, few farmers have applied for “biodiversity related” assistance in Nova Scotia, due in part to the limited local knowledge and expertise available to support effective on-farm Agricultural Biodiversity Conservation Planning (ABC Plans). ABC Plans can be an important tool to clearly identify to farmers the existing and potential Beneficial Management Practices (BMP’s) that promote the maintenance or enhancement of biodiversity (including enhancement of waterfowl breeding habitat) on their farms. The general intent of ABC Plans is to provide agricultural producers and practitioners with realistic and specifically tailored land use options that support biodiversity and conservation planning. ABC Plans can be used to demonstrate to farmers the costs and benefits of adopting BMPs to their operations and for the conservation and restoration of wetlands, riparian edges and biodiversity on the agricultural landscape. ABC Plans can also provide members of the local agricultural community an opportunity to assess how BMP’s can be adapted to their farm and to discuss the value of these practices with neighboring farmers.

Action - The NS-EHJV Wetland Stewardship Program will complete 150 Agricultural Biodiversity Conservation Plans (ABC Plans) on farms located in the Valley and Central Lowlands and Northumberland and Bras d’Or Lowlands Ecoregion. These ABC Plans will complement the enhancement activities outlines in the NS-EHJV Implementation Plan. The NS-EHJV Wetland Stewardship Program will also continue to develop partnerships with agricultural producers, provincial agricultural extension staff, agricultural practitioners, NGO’s, municipal agencies, and other levels of government to develop and implement new BMP’s that conserve wetland habitats and support increasing breeding potential for NS waterfowl. These actions will contribute to achieving the waterfowl population goals for Nova Scotia by influencing positive land use practices to support and maintain critical breeding habitat for American black duck, mallard, green-winged teal, ring-necked duck and Canada goose.

RESTORATION

The EHJV partnership aims to restore breeding waterfowl populations to the relatively high levels observed during the past decade and improve the nutritional status of migrating and wintering waterfowl thereby increasing their survival and reproductive potential. Habitat objectives are linked to desired population goals for a group of key species. Habitat objectives for key species are assumed to reflect and accommodate the needs of other waterfowl species within NS. However, the habitat objectives will be refined and adjusted as new biological and environmental information is developed and integrated into a model-based decision process.

EHJV partners will employ an array of habitat conservation tools/approaches to achieve habitat goals that will produce the desired waterfowl population response. These are generally categorized as habitat restoration or retention.

Wetland restoration includes actions that restore habitat features (e.g. provide key the “missing element” that relates to the key waterfowl vital rates) that has been lost or degraded, and creating new waterfowl habitats that serve as ecological equivalents to lost habitat.

BREEDING

Attaining waterfowl breeding population goals in NS will require an increase in the breeding populations of black ducks, mallards, green-winged teal and ring-necked ducks (Table 10-A). In effect, programs must reduce or eliminate limiting factors to overcome the population deficit. The key limiting factor for black ducks, mallards and green-winged teals is assumed to be duckling survival and breeding propensity (assessed through waterfowl settlement rates). However, other factors such as inter-specific competition are important drivers of black duck populations. Key limiting factors for ring-necked ducks are unknown. Annual population surveys are not available for the other key waterfowl species. Waterfowl deficits were calculated as the difference between the mean IBP (1995 – 2005) and the IBP goal. The deficit provides context for the relative investment in conservation actions required to achieve population goals. Recognizing that restoration activities benefit the suite of key species in Table 28 we assume an overall population deficit of 7200 IBP.

Table 28. Waterfowl breeding population trends and means (1995 – 2005). Data from the Maritime waterfowl survey.

	IBP trend (1995 – 2005)	Significance of IBP trend	Mean IBP (1995-2005)	IBP goal	Waterfowl Deficit
Black Duck	Stable	P=0.83	29286±5911	37000	7214
Mallard	Increasing	P=0.01, R ² =0.52	890±837	2000	1110
Green-winged Teal	Stable	P=0.11	3283±1897	4000	717
Ring-necked Duck	Stable	P=0.22	5690±1704	7500	1810

The maritime waterfowl survey produced an overall mean IBP density (1995 – 2005) for key waterfowl species of 0.71 ± 0.18 IBP/km². Estimates for all surveys waterfowl were 0.8 ± 0.2 IBP/km². However, Maritime waterfowl surveys tend to avoid agricultural and coastal areas, which we assume support greater densities of waterfowl. For example, Pollard (2000) reported waterfowl IBP that were about double those from the Maritime waterfowl survey. Therefore, surveys and density estimates are likely conservative. The eco-districts that contain the bulk of the agricultural lands encompasses 12,462 km². Pollard estimated 0.34 IBP/km² for agricultural areas. Therefore the agricultural eco-districts supports about a quarter of NS breeding waterfowl.

The waterfowl deficit will be addressed by expanding surveys into agricultural areas to obtain a more comprehensive understanding of waterfowl breeding abundance. In addition, Pollard (2000) demonstrated that it was possible to double waterfowl production through wetland enhancement activities in agricultural areas. In addition, he also demonstrated that work on the agricultural areas resulted in increased waterfowl densities in adjacent forested area. Therefore, enhancement activities focused on the agricultural areas will over time close the waterfowl deficit.

There have been substantial declines in wetlands within the agricultural and coastal areas of NS. A significant amount of wetland in these agricultural areas has been lost through direct alteration. Much of this has occurred through the infilling or drainage of an unknown but significant amount of small wetlands. In addition, the conversion of 33,000 ha of coastal marsh to dykelands along the

Bay of Fundy has resulted in a loss of 65% of the regions coastal wetlands. In the Annapolis Valley and on the Tantramar Marshes of NB up to 90% of the original wetlands have been lost. Remaining wetlands within agricultural watersheds can potentially be degraded through contaminated runoff containing high levels of nutrients, sediments or pesticides.

Wetlands within the agricultural areas continue to be lost or negatively impacted. We evaluated historic change in wetlands by reviewing a series of Air Photographs from the 1940's and 1980's in an intensively farmed area along the St. John River (NB) between Woodstock and Waterville. Within the surveyed 176 km², there were 855 ha of wetland in the 1940's. Forty-five ha of wetland were lost over the period primarily to ditching, infilling and natural sedimentation of predominantly small wetlands (average size 3 ha). During this period 6.5 ha of beaver ponds were formed. Thus, 39 ha of wetlands were lost representing 5% of the wetland base.

The underlying soil fertility in agriculture landscapes is greater than in forested landscapes. This results in wetlands in agricultural areas being more productive than wetlands in forested landscapes. DUC assessed the waterfowl IBP and brood responses for all waterfowl species on a series of enhanced wetlands from 1980 – 1982. We compared the waterfowl response to enhanced wetlands in a forested and agricultural landscape and demonstrated that there were significantly more pairs and broods on wetlands in the agricultural landscape compared to the forested landscape (Table 28: t-test, Pairs, 25 df, $t = 3.57$, $P = 0.0015$, broods, 26 df, $t = 2.34$, $P = 0.027$). Therefore, wetland restoration programs will be focused in agricultural areas where waterfowl response will be greatest.

Table 29: Comparison of IBP and brood use of large restored wetlands in forested and Agricultural landscapes

Landscape	# projects	# survey years	Pairs/ha	# survey years	Broods/ha
Agriculture	22	40	1.00 ± 0.82	39	0.95 ± 1.1
Forest	10	17	0.34 ± 0.18	17	0.36 ± 0.27

Wetland restoration is one of the key solutions to increasing waterfowl population for the key species (Table 28) as it improves the abundance and productivity of brood rearing habitat. We assume that duckling survival is the key limiting factor for our key species. This activity directly increases duckling survival and should increase the number of breeding pairs settling in the landscape. Positive responses to creation of freshwater wetlands in breeding pair densities (All

species: Pre treatment 33.8 pairs/100 km², Post treatment 64.4 pairs/100km²) and brood use (All species: Pre treatment 72 broods, Post treatment 162 broods) were demonstrated by Pollard (1996) at Belle Isle NS. Based on these results, we established the goal of doubling waterfowl production from the agricultural landscape.

Currently brood rearing and pairing wetlands represent 2.1% of the agricultural landscape in NS. Based on Pollards (2000) results at Belle Isle, we established a long-term goal of increasing wetland densities to 4% of the agricultural landscapes. Wetland enhancement will focus primarily on marginal farmlands and wet and difficult to farm areas on active farms. Enhancement will restore some of the wildlife productive capacity and natural capital to the agriculture landscape. This is important given that in some areas 90% of existing wetlands have been lost or degraded.

Given the deficit in breeding waterfowl in NS (Table 28), we will need to restore or intensively manage an additional 4450 wetland ha in NS. This is beyond the scope of the resources available over the 5 years of the implementation plan. **However resources will focus on eliminating 1,950 ha or about 44% of the habitat deficit over the coming 5 years.**

Rural Wetland Restoration Program:

The Rural Wetland Restoration Program will diversify the landscape throughout the Maritimes by putting more open water on the agricultural landscape. The restored wetlands are open water marshes approaching a hemi-marsh state. The focus of this program is rural non-farming landowners. This program involves restoring waterfowl habitat on small fresh water wetlands in the agricultural landscape. This involves the removal of vegetation and organic soil from densely vegetated wetlands or by placing of small earthen berm, to restore shallow open water wetlands. Many of the wetlands enhanced show signs of alteration through infilling or drainage ditches.

Restoration of small wetlands within the agricultural landscape result in a significant increased number of waterfowl pairs and broods (Stevens et al. 2003, Table 30). Mean wetland size in this study was 2.3 ± 0.31 hectares. Thus small marsh restoration produces an array of expected pair and brood responses (Table 31). These results indicate a positive waterfowl response with 3.9 times the density of indicated breeding pairs and 7.5 times as many broods on restored versus control wetlands. Therefore, restoration of small wetlands will produce a significant positive waterfowl

response that addresses the key vital rate of brood survival. We assume that the landscape level benefits to waterfowl are enhanced when small wetlands are restored in proximity to large open water wetlands. Figure 21 provides a visual representation of this concept.

Table 30: Waterfowl indicated breeding pairs and brood per wetland on restored and control wetlands (Stevens et al 2003).

Species	Pairs		Broods	
	Restored	Control	Restored	Control
Black Duck	1.38±0.25	0.67±0.15	0.70±0.2	0.06±0.05
Mallard	0.32±0.16	0.06±0.06	Ns	
Green-winged Teal	0.80±0.22	0.18±0.12	0.45±0.15	0.08±0.07
Ring-necked Duck	1.02±0.36	0.06±0.06	0.14±0.07	0
Gadwall	0.55±0.30	0	0.11±0.07	0
Blue-winged Teal	0.43±0.12	0.06±0.04	NS	

Table 31: Waterfowl indicated breeding pairs and brood/ha per wetland on restored and control wetlands (Stevens et al 2003).

Species	Pairs		Broods	
	Restored	Control	Restored	Control
Black Duck	0.6	0.32	0.3	0.03
Mallard	0.14	0.03	0.02	0
Green-winged Teal	0.34	0.09	0.20	0.04
Ring-necked Duck	0.44	0.03	0.06	0
Gadwall	0.24	0	0.05	0
Blue-winged Teal	0.19	0.03	0.05	0.02
Total	1.95	0.5	0.68	0.09

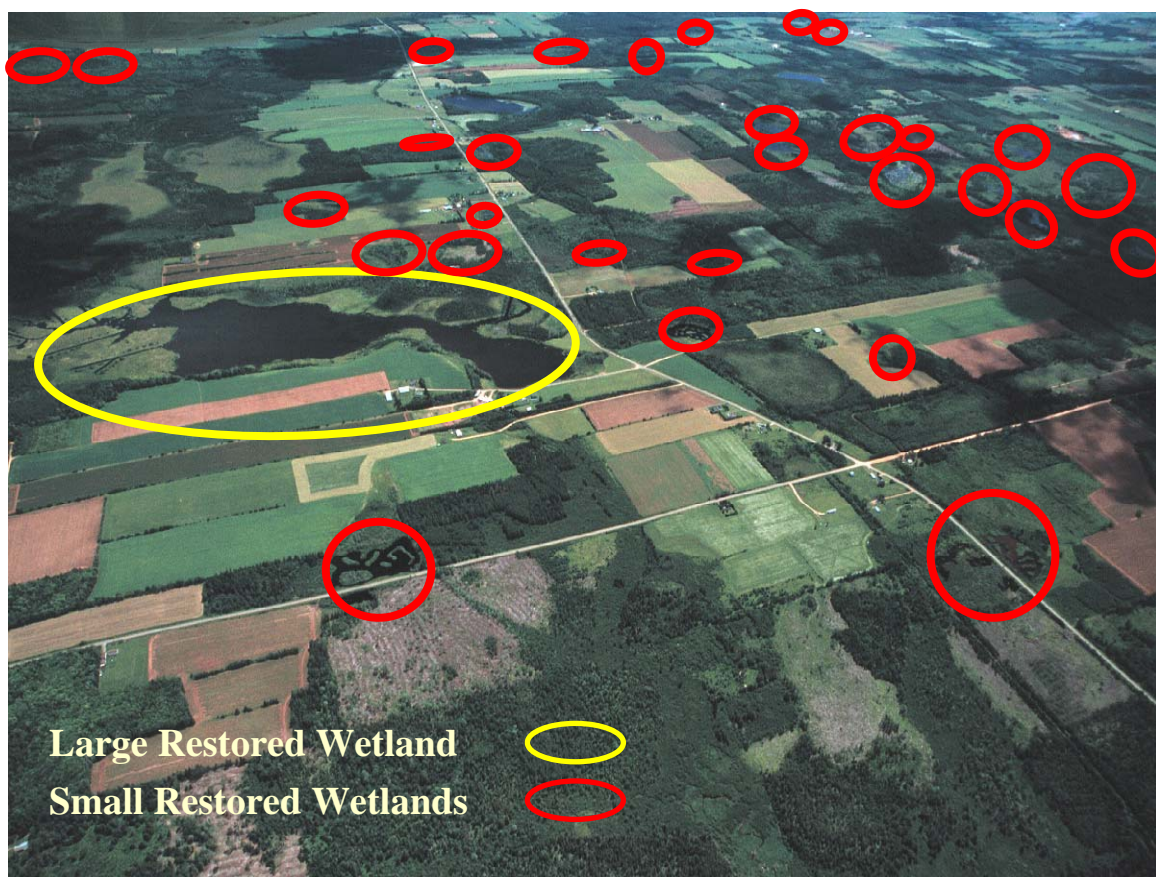


Figure 21. Optimal juxtaposition of small and large restored wetlands.

To date over 515 projects have been completed in the Maritimes resulting in the restoration of 960 ha. In NS 133 projects (210 ha) have been developed. The potential exists to restore an addition 4,000 wetlands across the Maritimes. **The NS target is to restore 125 sites (200 ha) over the next 5 years.** This is expected to result in an overall increase of 390 pairs settling in the agricultural landscape, as well as the annual production of 136 additional broods. Species specific benefits are summarized in Table 32.

Table 32: Species specific pair and brood responses to restoration of 200 ha of small wetland. Based on waterfowl indicated breeding pairs and brood/ha per wetland on restored and control wetlands (Stevens et al 2003).

Species	Pairs	Broods
Black Duck	120	60
Mallard	28	4*
Green-winged Teal	68	40
Ring-necked Duck	88	12
Gadwall	48	10
Blue-winged Teal	38	10
Total	390	136

* Mallards were starting to colonize PEI at the time of the study, so brood response is thought to be conservative.

Agricultural Biodiversity Program:

Opportunity now exists to restore wetlands on agriculture lands through federal and provincial agriculture programs. In recent years the agricultural community has become proactive in implementing environmental programs within farm management. Examples in Atlantic Canada include the development of environmental farm plans and assistance programs to help farmers implement environmental initiatives. The announcement of the Agricultural Policy Framework (APF) in 2003 includes a greater focus on the environment. The APF encourages the farm community to put in place practices that will lead to better quality air, soil, water and biodiversity. Thus, the APF provides a great opportunity for EHJV partners to increase the amount of wetland restorations on private land. Restoring wetland on the landscape produces the greatest waterfowl response because of the relatively high productivity of these wetlands.

Over the last few years, DUC has engaged the agriculture sector to increase wetland quantity and quality within the agricultural landscape. Current environmental developments within agriculture under the Agricultural Policy Framework (APF) have focused on improving the quality of water, air, soil and biodiversity. Clearly there is convergence of mission between EHJV partners and agriculture regarding improvements in biodiversity and water quality on farm. This represents a significant opportunity to reverse the loss of wetland on the agricultural landscape.

In 2004, DUC embedded conservation programs as solutions for farmers using the EFP process and signed an MOU with Nova Scotia Department of Agriculture to deliver this program. This provided a solution-based program that restores waterfowl habitat, provides farmers with one-stop shopping, with the program being managed and co-funded through the provincial Farm Investment Fund.

The Agricultural Biodiversity Program features a cost-share arrangement whereby government and the farmer will contribute 65% of the direct costs to complete a project. DUC will contribute 35% of the project cost. Through this new cost-sharing partnership, there is an opportunity to deliver more wetland restoration projects. The Program includes wetland restoration, constructed farm ponds-tertiary wetlands, beaver pond conservation, invasive species control and wildlife flushing bars. All these programs will result in restoration or enhancement of waterfowl habitat. The wetland components of this program all focus on improving duckling survival and breeding propensity (i.e. settling rates) for our key waterfowl species.

Wetland Restoration

Wetland restoration program assists farmers to restore wetlands on their property that are congested with vegetation, previously drained, or filled in. This is the same as the rural wetland restoration technique, but is focused on farms with Environmental Farm Plans.

In addition to the impact on waterfowl and wildlife habitat, the significant loss of wetlands compromises water quality and quantity, biodiversity, soil quality and the economic viability of people who depend on these natural resources. This program provides direct on-farm benefits as the restored wetland, when fenced, can provide a source of water for livestock and can be used recreationally by the farm family for skating, hunting or observing wildlife.

Constructed Farm Pond – Tertiary Wetlands Program

The farm pond-tertiary wetland program is an innovative approach to adding waterfowl habitat (i.e. wetlands) to the agricultural landscape. The program responds to the need from the livestock sector to mitigate the negative impacts of water runoff from feedlots, solid manure storages and disposal of milk house wastewater. Runoff often has high levels of nutrients and can carry contaminants (i.e.

bacteria, petroleum products, pesticides). Runoff can be a point source of contamination of surface water and aquifers and can potentially result in both human and animal health risks.

Natural processes within wetlands can improve the quality of the water leaving the farm. These natural processes can be engineered through constructed wetland systems involving the creation of primary and secondary wetland cells. Typically the primary and secondary cells require professional engineering assistance to design so they provide adequate treatment of runoff while protecting ground water. The quality of water can be further improved by the addition of a wetland cell that will also provide high quality wildlife habitat. The program provides incentives for the development of these tertiary wetlands so that in addition to clean water, habitat for breeding waterfowl is added to the landscape.

Beaver Pond Management

Beaver ponds provide significant waterfowl habitat in the agricultural landscape because of the juxtaposition of agricultural field and woodlots. With increasing beaver populations, there are increasing opportunities for beavers to construct dams that result in flooding of farm and forested land as well as roads. Removing the dams, trapping or shooting the beaver is often a time consuming and temporary solution to the problem.

To maintain the important waterfowl and wildlife habitat provided by beaver ponds. The program provides a creative solution by installing cost-effective beaver pond levellers on private or public lands that will maintain the ponds at a desired level and prevent flooding of roads and valuable land. This eliminates the need to deal with beaver problems (i.e. flooding) every year while maintaining the wetland, thereby providing habitat for many species of wildlife including black duck, wood duck, great blue herons, frogs and brook trout. The value of beaver ponds to waterfowl and other wildlife is well documented.

Program Impact

The impact on the landscape has the potential to contribute substantial habitat for waterfowl production. This will occur overtime as more farmers complete EFP's, as government adjusts incentives to promote wetland restoration and as conservation partners work with government and

farmers to convey knowledge in identifying projects and restoring wetlands. The next phase of APF will begin in April 2008 and it is expected that these positive changes will be captured in the next generation of Environmental Farm Planning.

This initiative will target the completion of 20 wetland restoration, farm pond construction and beaver pond conservation projects on 50 hectares of wetland by the end of 2008. This should result in an additional 98 pairs and 33 broods/year.

Large Wetland Restoration:

The traditional wetland restoration program has involved restoring large wetlands within the productive agricultural areas using a pool of restoration techniques (i.e., water control structures and dykes). The resulting habitat is typically open marsh in a hemi-marsh state. These wetlands are important to all key waterfowl species in terms of increasing duckling survival. Table 29 describes the pair and brood use of these wetlands. These intensively managed wetlands are essential to increasing the overall carry capacity of the landscape and on average support 1 brood/ha. Pollards (2000) work demonstrated that strategic deployment of these activities produces substantive waterfowl breeding pair and brood capacity at the landscape scale. This restoration technique is also critical in highly developed agricultural setting like the Annapolis Valley where it is unrealistic to increase the wetland density to the desired level of 4 wetland ha/km².

The opportunity for this type of restoration is becoming increasingly limited as a result of past success and a changing regulatory environment. **However, the target is to restore 50 sites resulting in 500 ha of wetland restored within the agricultural landscape.** As a minimum this should result in an additional 500 pairs and 475 broods/year. However, waterfowl response is expected to be greater, particularly when small wetlands are restored in the periphery of these wetlands.

Large wetland restoration will include older DU projects that were restored prior to NAWMP. New 30-year conservation agreements will be signed with the landowners as these older DUC projects reach their constructed expectancy and are rebuilt as NAWMP projects. Although a fund has been established to maintain NAWMP projects as they were developed beginning in the 1990s, the maintenance and rebuild costs for many of the older DUC wetland projects have not been secured.

A \$9 million Atlantic Canada's Habitat Partnership Legacy Fund, similar in purpose to the Continuing Habitat Project Operations (CHPO) for NAWMP projects, has been recently proposed by DUC to ensure these early projects continue to make a significant contribution to the enhancement of waterfowl resources in the Atlantic region.

Municipal Large Wetland Restoration:

There is growing public interest in restoring wetlands in proximity to urban and municipal centers. These projects typically involve restoration techniques similar to large wetland restorations and produce similar waterfowl benefits (see above and Table 29). However, they often have additional features such as interpretive trails and signage. These additional features elevate the importance of wetland restoration to the public. Funds for the additional interpretive features are raised outside the NAWMP.

The opportunity exists to restore 5 municipal wetlands resulting in 50 ha of restored wetland. As a minimum this should result in an additional 50 pairs and 48 broods/year. However, waterfowl response is expected to be greater.

Beaver Management:

Beavers are abundant and widely distributed in NS. As a result, beaver ponds are a prominent landscape feature in both the forest and agricultural landscapes and provide important wildlife habitat. Healthy beaver population are critical to the stability of waterfowl populations in the forested regions of Canada because they create and maintain a diversity of habitats important to breeding waterfowl (Gabor et al. 2002). However, in settled areas conflicts between beavers and man can be frequent and substantive. Typical solutions involve removal of the beavers and loss of the habitat.

The beaver management program also applies to non farm land and is similar to the program laid out in the biodiversity section. The program focuses on beaver that are creating a conflict with human interests (i.e., flowing roads, agricultural lands, forest). Estimates of waterfowl use of beaver ponds are 0.4 IBP/ha and 0.6 broods/ha (Gabor et al. 2002). The potential exists to intensively manage 1000's of wetlands in the agricultural landscape. **The program will result in intensive**

management of 25 sites resulting in management of 100 wetland hectares. This will result in 50 pairs and 50 broods/year.

Tidal Wetland Restoration:

Tidal wetlands have been the most greatly impacted by human activity. There are a variety of impacts and as a result tidal wetland restoration can take many different forms. For example the removal of an agricultural dyke might allow a piece of dykeland to revert to salt marsh or perhaps mud flat in the short term. On the other hand the blockage of man-made ditches on a salt marsh might result in the re-creation of salt marsh pans and the removal of a causeway might change the vegetative community of a marsh both the upstream and downstream. By its very nature tidal marsh restoration work is expensive. The forecast rate of sea level rise (0.4m/century) will impact the future extent and distribution of tidal marsh and will need to be considered as part of all restoration and coastal securement activities.

Restoration of tidal wetlands will have a wide variety of benefits depending upon the technique involved. While it is likely that most restoration activities would result in an increase in nutrient export to the estuary this may not be the case for ditch plugs designed to hold water on tidal marshes during the low tide cycle. This restoration technique would however improve the quality of the marsh for waterfowl and other wildlife species if ponds were limited. The conversion of dyked agricultural land to tidal marsh has broad societal benefits as well as benefits for waterfowl, other coastal wildlife, fish, the health of the estuary, carbon sequestration, and nutrient recycling processes.

The primary waterfowl benefit is to staging waterfowl, however, tidal wetlands do support some broods of Black Ducks. Estimates of brood production are 0.1 brood/ ha. This program is of particular interest to fisheries and other conservation organizations that will need to invest their resources for this type of restoration. **This project will restore 5 wetlands corresponding to 50 ha of tidal marsh.** This will provide an estimated increase of 10 pairs and 10 broods/year.

Intensive Wetland Management:

Intensive management generally requires repeated efforts to attain and sustain habitat conditions. These actions improve habitat conditions for waterfowl beyond what would occur in the absence of

management and are suited to areas where the overall carry capacity of the landscape has been reduced.

There are a total of 8220 ha of managed wetlands in NS. Of these 3290 ha are NAWMP projects. A substantial part of these enhanced wetlands involve the construction of dykes and water control structures that require ongoing operation and maintenance. As projects age their productivity gradually declines as the interspersion of water within the vegetation decreases. Active management can reverse these trends. These activities include water level adjustment, repair and upgrading of water control structures or dykes, and physical manipulation of vegetation. Active management of wetlands will help ensure that waterfowl productivity is retained.

A significant inventory of intensively managed projects in Atlantic Canada is now aging. One of the consequences of this aging aside from the decline in the condition of the infra-structure is typically a gradual decline in productivity as the wetlands move increasingly away from a hemi-marsh state. These activities can be reversed or minimized through intensive management activities. These activities can be low cost like water level manipulation when the vegetative community is rooted, to high cost of physically removing dense vegetation mats. These activities are expected to return to waterfowl productivity back to levels expected in the early stages of the project.

Investments in these activities will focus on those wetlands within the productive agricultural areas. **Activities will focus on intensive management of 1,000 ha of wetlands over the 5 years of the agreement.** This is expected to support and additional 475 pairs and produce 475 additional waterfowl broods.

Action - Wetland restoration activities will result in 1,950 ha of restored wetlands over 5 years. The waterfowl response to these restored wetlands will accumulate as the program is deployed across the landscape. Table 33 summarized the compounded breeding waterfowl response to wetland restoration.

Currently, there are no waterfowl productivity models that relate the additional brood production to waterfowl population response. We recommend that waterfowl productivity models are developed to help understand the waterfowl population response to conservation actions.

Table 33. Anticipated waterfowl increases in pairs and broods from wetland restoration programs. Cumulative production represents the compounded broods produced assuming that 20% of the restored hectares occur each year.

Program	Projects	Restored Ha	Production in 2010		Cumulative Production
			Pairs	Broods	Broods
Rural wetland restoration	125	200	390	136	405
Agriculture Biodiversity	20	50	98	33	147
Large wetland restoration	50	500	500	475	1500
Municipal wetland restoration	5	50	50	48	72
Beaver pond	25	100	50	50	150
Salt marsh restoration	5	50	10	10	30
Intensive Wetland Management		1000	475	475	1425
Total	230	1950	1573	1227	3729

Staging and Wintering

The number of birds staging and wintering in NS is related to continental and local breeding population size, habitat conditions and food availability as well as weather. NS waterfowl are exclusively associated with the Atlantic flyway. Milder winters are resulted in long ice-free periods that are resulting in increased wintering populations as well as potentially increasing the residency time of waterfowl during migration.

The availability of high-energy food resources from our agricultural activities is a key factor for staging waterfowl such as Black Ducks, Mallards and Canada Geese. Access to aquatic food resources is important for species that do not feed in agricultural fields, like ring-necked ducks and green-winged teal. Wetland drainage within the agricultural landscape has likely degraded habitat conditions for staging waterfowl. However, given the mobility of most species and the proximity of agricultural areas to coastal environments, this degradation is likely buffered to some degree by the availability of coastal and estuarine habitats. These coastal and estuarine habitats are also important to migrating sea ducks such as common eiders, black scoters and long-tailed ducks. Aquaculture

activities are increasing human waterfowl interactions in the coastal environment. However, the overall impact of these interactions on migrating and wintering waterfowl is unknown.

Staging and wintering contributions from NS may be as important as breeding contributions to continental waterfowl populations. This statement is supported by the diversity of species and the migration numbers. Estimates of fall flights in Atlantic Canada are 3 million waterfowl. However, these estimates are conservative as they under represent sea ducks. NS supports a substantial migration of sea ducks. It is assumed that residency times of field feeding waterfowl are relatively long.

Limiting factors:

The abundance and accessibility of quality foods and adequate energy are considered limiting factors for many migrating and wintering waterfowl. However, the availability of waste grain and legumes from agricultural activities is assumed to meet the energetic needs of most key staging waterfowl.

Late winter and spring nutrition and survival may limit some species, particularly Black Ducks, Scaup, scoters and eiders that rely little if at all on agricultural landscapes. There are no regional studies comparing food availability and quality for either agricultural or coastal landscapes. Work in Southern Ontario suggests that fall foods exceed the needs of waterfowl but spring foods may have been inadequate (Barney and Petrie 2006).

For field feeding waterfowl we assume that the interspersed of fresh water wetlands and coastal habitats is sufficient to meet their needs. We assume the same for diving ducks as well, but are less certain about this assumption.

For sea ducks and coastal waterfowl we assume that the current mix of habitat and food resources is sufficient to meet their needs. Anthropogenic factors however, may be influencing access to these resources.

Energy needs per individual:

Estimates of energy needs during staging and winter are estimated based on body mass and calculation of Basal Metabolic Rate (Aschoff and Pohl 1970). Wintering energy needs are slightly

higher than for staging so rates were adjusted. Staging and wintering needs are expressed in terms of daily energy requirements (DER).

Table 34. Estimated basal metabolic rate (BMR) and daily energy requirement (DER) of key species for staging and migration.

Species	Body Mass (kg)*	BMR (kcal/day)**	DER staging (kcal/day)***	DER winter (kcal/day)***
Black Duck	1.25	87	290	400
Mallard	1.25	86	290	400
Lesser Scaup	0.85	65	156	299
Ring-necked Duck	0.78	61	146	281
Common Eider	2.0	122	292	561
Black Scoter	1.15	80	192	368
Long-tailed Ducks	0.82	63	151	290
Canada Geese (NAP)	4.0	203	487	934

* body mass based on adult males from Bellrose 1980.

** BMR = $73.5(\text{mass})^{0.734}$ mass in kg (Aschoff and Pohl 1970).

*** DER staging = 2.4BMR and DER winter = 4.6BMR.

Energy Available Per Unit Area.:

A key information need is the evaluation of energy available to staging and wintering waterfowl using both the agricultural and coastal environments. From this we could assess if deficits exist and develop responsive conservation programs. This could also serve as a means of focusing retention activities and demonstrating waterfowl consequences of these programs.

Wetland Restoration:

There is limited information on the staging value of managed wetlands in Atlantic Canada. However, results of staging surveys of restored wetlands are summarized in Table 35. We used a value of 6 staging waterfowl/ha, as the average production from the projects along the St. John River was 6.1 staging waterfowl/ha when the 2 projects that were closed to hunting were eliminated. Table 36 demonstrates that managed wetlands are used heavily by several of our key waterfowl species particularly black ducks. Waterfowl usage of restored wetlands typically peaks towards the end of September prior to the opening of the hunting season.

The existing inventory of 8220 ha of restored wetlands in NS conservatively stages 50,000 waterfowl. The placement of these restored wetlands in proximity to agricultural areas likely enhances an individual's ability to access key agricultural food resources. While the wetland restoration activities primarily provide breeding benefits, the restoration of an additional 1,950 ha of

wetlands within the agricultural landscape is expected to increase the capacity of the landscape to support an additional 10,000 staging dabbling ducks.

Restored wetlands provide limited wintering benefit for NS waterfowl. However, changes in climate may result in these wetlands remaining ice-free for longer periods. As such, restored wetlands may become increasingly important to wintering waterfowl.

Table 35. Average ($\bar{x} \pm \text{stdev}$) waterfowl staging densities on restored wetlands

Study	# restored wetlands	Wetland restored	ha	Date	Average staging birds/ha
St. John River (NB)*	12	620		Late Sept	9.3
				Early Nov	6.4
Musquash (NB)	4	155		Late Sept	3.8
Aulac (NB)**	2	37		Late Sept	102 \pm 64

* Two projects that were closed to hunting, average was 6.1 waterfowl/ha when the wetlands closed to hunting were eliminated.

** Project closed to hunting. Three years of surveys.

Table 36. Key waterfowl species as a proportion of survey totals

Study	Black duck (%)	Mallard (%)	Green-winged teal (%)	Ring-necked duck (%)
St. John River	58.5	12.5	7.5	-
Musquash	44.1	0.2	36.9	2.6
Aulac	45.8	9.5	4.4	2.5

MANAGEMENT

Management will involve the inspection and maintenance of water control structures, vegetation control and other related activities, to ensure that the wetlands secured under NAWMP are providing optimal wildlife habitat conditions.

Action - Habitat management will occur throughout all Ecoregions on existing NAWMP projects (currently 13,846 hectares). This action will contribute to achieving the waterfowl population goals for Nova Scotia by maintaining critical wetland and associated upland habitat for breeding, wintering and staging.

COMMUNICATIONS

Communication activities are specific to actions that reflect a public profile for the EHJV and its participants. This includes but is not confined to media announcements, publications, advertising, signage and special events. Communications efforts of the NS-EHJV will complement those outlined in the EHJV Communications and Work Plan. General objectives of EHJV communications are:

- To promote the EHJV collaboration while maintaining the profile and conservation integrity of the individual partners.
- To increase awareness, understanding, and support within targeted audiences for the work of EHJV.
- To use existing EHJV resources and products for the maximum benefit of the collaboration.
- To develop new communications products and tools to support EHJV development.
- To facilitate sharing among EHJV partners of programs, products, ideas, and initiatives.

Action - Communications activities will include the design and production of signs identifying projects and the promotion and delivery of existing wetland conservation displays and literature to various audiences throughout the province. This action will contribute to achieving the waterfowl population goals for Nova Scotia by increasing public awareness of critical breeding, wintering and staging issues associated with waterfowl, wetlands and associated upland habitats.

POLICY

The following paragraph came from a Jacques Whitford Report - Wetlands in the Agricultural Landscape: Nova Scotia Discussion Paper (March 2006)

Within Nova Scotia, responsibility for wetlands management spans a number of departments, including: the Department of Environment and Labour as the lead agency for water management and environmental assessment; the Department of Natural Resources as the lead agency for wildlife habitat, species at risk, Crown lands, and forestry; the Department of Transportation and Public Works as the responsible agency with respect to highway impacts; the Department of Agriculture and Fisheries as the responsible agency with respect to agricultural impacts, fish habitat, and delivery of the Agricultural Policy Framework (APF); and Service Nova Scotia and Municipal Relations as the responsible agency for the assessment of all lands for taxation purposes. A number of provincial agencies have responsibilities with respect to land use planning. Municipal governments also have influence on the conservation and management of wetlands through zoning and municipal land use plans. Within the province, the Government of Canada's Federal Policy on Wetland Conservation applies to all federal lands and federal policies and programs (see Section 2.2). The Federal Policy for the Management of Fish Habitat also applies to wetlands.

The Nova Scotia Department of Environment and Labour (NSDEL) recently developed a Wetland Designation Policy (<http://www.gov.ns.ca/enla/water/wetlandalteration.asp>) that came into effect on March 1, 2006. The policy recognizes that wetlands are a particularly sensitive habitat and that alteration of wetlands can cause an adverse environmental effect. The policy requires that an approval be obtained from the department for any activity which would result in alteration of an existing wetland. This policy does not apply to man-made wetlands created specifically for the purposes of wastewater or storm-water treatment.

In June 2007, Nova Scotia also approved the Environmental Goals and Sustainable Prosperity Act, which has a target to implement a policy to prevent net loss of wetlands in Nova Scotia by 2009. For more information on the Nova Scotia Environmental Goals and Sustainable Prosperity Act go to http://www.gov.ns.ca/legislature/legc/bills/60th_1st/3rd_read/b146.htm.

Agricultural Wetlands Policy

Nova Scotia was recently involved in a project initiated by Ducks Unlimited Canada to bring together stakeholders from government, agriculture and environment sectors to discuss future wetland policy and programs in the agricultural landscape. The results of this project were presented in a report prepared by Jacques Whitford Consultants titled Wetlands in the Agricultural Landscape: Nova Scotia Discussion Paper (March 2006).

The following wetland policy and program recommendations were made in the discussion paper:

- Greater knowledge regarding the benefits and costs of wetlands is required.
- Policies and programs should consider who benefits by and who pays for wetland conservation in keeping with the benefits principle (*i.e.*, society should pay for the benefits they receive, and mechanisms need to be in place to allow for this).
- The costs to landowners of wetland conservation and restoration must be taken into account in the development of policies and programs.
- An approach to the delivery of wildlife depredation compensation programs that is consistent across Canada should be developed.
- The provincial government should make wetlands tax exempt.
- Government and market-based incentives should be provided to landowners for wetland conservation in agricultural areas.
- Programs should emphasize voluntary participation over regulation.
- Integrated wetland policies and programs are needed across levels of government and between departments.
- There should be a “one window” delivery of wetland programs, with a single agency to co-ordinate activities.
- Federal and provincial departments and agencies should adopt the same definitions for technical terms and interpret concepts similarly.
- Attention needs to be paid to landscape-level management and stewardship in the delivery of government programs and policies. The paramount conservation issue is the maintenance of ecosystem functions.
- The provincial wetland inventory should be refined to include information that will assist in the prioritization of wetlands for conservation, as well as the monitoring of changes in wetlands over time.
- It is recognized that dykelands and adjacent floodplains are a valuable agricultural asset in Nova Scotia and need to be categorized differently by wetland policies and programs attempting to conserve unaltered wetlands.

Coastal Policy

The NSDEL Wetland Designation Policy applies to alteration of salt marshes. However, other types of tidal wetlands such as: lagoons, mud flats and tidal ponds are not subject to this policy and their alteration does not require an approval from Nova Scotia Environment and Labour.

Policies regarding Coastal Islands do not currently exist for Nova Scotia.

Action - Habitat conservation requires a commitment by the public, NGO's and all levels of government to the development and implementation of appropriate land use policies and regulations. Policies to further conserve wetlands and coastal habitats will continue to be supported by the NS-EHJV to positively influence breeding, wintering and staging habitats for waterfowl.

EVALUATION

The objective of the NS-EHJV Evaluations program is to assess whether the implemented conservation programs provide for better conservation of waterfowl populations and their habitats. Evaluations also help to validate the biological assumptions used in developing conservation programs and test the efficacy of conservation activities. Evaluations generally consist of monitoring, directed studies and assessment.

Monitoring

The assessment of spatial and temporal adequacy of current waterfowl monitoring programs for key waterfowl species of the EHJV was discussed at the EHJV Science Workshop (July 18-19, 2006). Monitoring adequacy specific to Nova Scotia EHJV Key Waterfowl Species is in Table 37

Table 37: Assessment of spatial and Temporal adequacy of current waterfowl monitoring programs for key waterfowl species (adapted from: EHJV Science Workshop July 18-19, 2006)									
NS Key Waterfowl Species									
	Monitoring	Breeding	Temporal	M	S	T	M	S	T
	*	**	***	*	**	***	*	**	***
American black duck	Y	Y	Y				Regional	Incomplete	Y
Mallard	Y	N	Y				Picked up under Black ducks		
Ring-necked duck	Y	Y	Y						
Common eider – 3 subspecies	Regional	Incomplete	Y	N			N		
Canada goose – Resident	Regional	Incomplete	Y	N					
Canada goose – NAP	Y	Y	Y	Y	Y	Y	Regional	Incomplete	Y
American Green-winged teal****									

*Is an EHJV wide monitoring program currently being delivered?

** Does the current monitoring program have adequate spatial coverage?

*** Is the current monitoring program occurring at the correct time of year?

****Green-wing teal was not assessed at the July 18-19 EHJV Science Workshop.

Eastern Canada Waterfowl Survey

The Eastern Canada Waterfowl Survey is currently the only annual breeding waterfowl monitoring program delivered in Nova Scotia. This survey is delivered by Environment Canada in late April through early May. The survey is based on a 30-plot rotating sample in which a specified subset of 25 km² plots (Image 11-B) are flown in each year. The 30 plot sample framework is divided into 4 rotation groups with two of the rotation groups visited in each year. The survey then repeats this 4

year cycle. Total waterfowl breeding pairs and birds are estimated for each year, as are annual trends in abundance.

The need for new monitoring techniques has been identified and is currently under development for species and/or landscapes that are not well represented in the current surveys (Figure 21).

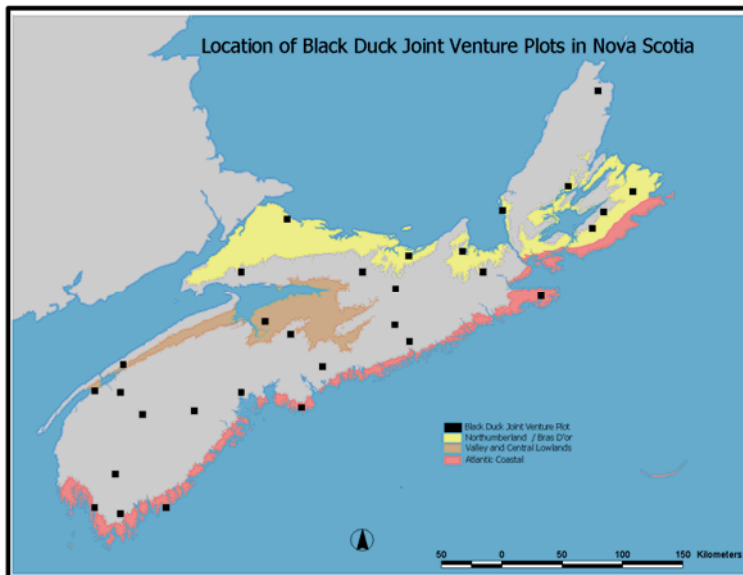


Figure 22. Eastern Canada Waterfowl Survey – NS Breeding Pair Plots.

Black Duck Wintering Survey

Given evidence that American black ducks may have extended their winter range northward over the past decade or more, aerial surveys to document abundance and distribution of wintering black ducks are being undertaken as resources permit. At present, this survey program is not envisioned to be conducted annually, however periodic surveys should provide an indication of trends in black duck use of coastal areas over time.

Directed Studies

Directed studies are designed to expand the EHJV knowledge of waterfowl, waterfowl habitat and the waterfowl use of various habitat types. Directed studies are often delivered in association with an academic institution and often involve many partners. Directed study projects are intended to be specific in nature and often lead to modifications of operational standards or program restructuring. The NS-EHJV Technical and Steering is responsible for identifying and establishing directed study

priorities. All directed study projects will be required to go through review by the EHJV Science Support Team.

Maritime Waterfowl/Habitat Model

The NS-EHJV Partners are committed to developing a Maritime Waterfowl/Habitat Model to strengthen the scientific understanding of the relationships between habitat conditions and waterfowl populations for the Maritimes. The Maritime Waterfowl/Habitat Model will explore ways to determine habitat specific recruitment rates for maritime landscapes.

Other priorities for directed study projects may include:

- Examine trends in wetland loss
- “Biodiversity” related research in the agricultural landscape
- Understanding the importance of riparian areas towards waterfowl recruitment
- Understanding wintering distribution of waterfowl in relation to habitat productivity and threats (e.g. oil spills)

Past directed study projects (from *EHJV NAWMP Assessment Questions and Process Accounting of Accomplishments document – January 2006*) delivered in Nova Scotia from 1989-2005 include:

- The fate of phosphorus in lakes following fertilizer addition.
- Fledging success of black ducks and mallards breeding at high and low productivity sites.
- The effects of the timing and duration of drawdown on freshwater impoundment productivity in Atlantic Canada.
- Impacts of Atlantic dykeland wetland restoration to regional waterfowl populations.
- Evaluation for environmental factors responsible for high waterfowl production at the Allain’s Creek Ducks Unlimited impoundment.
- Maritime wetlands inventory – update of documentation and database.
- Wastewater treatment performance and wildlife habitat use of two small constructed wetlands.
- Beaver and Ducks Unlimited impoundments of the Pugwash River watershed with recommendations for management.
- Use of artificial nesting shelters by Common Eider ducks, *Somateria mollissima*, on offshore islands of the Eastern Shore of Nova Scotia.
- Habitat use by nesting Common Eider ducks, *Somateria mollissima*, on offshore islands of the Eastern Shore of Nova Scotia.
- Vegetative composition of old-field habitat on Belleisle Marsh, Annapolis County, Nova Scotia, with particular reference to invasive and noxious species.
- Baseline information reports on 12 coastal areas of significant importance to wildlife: A project to facilitate the Eastern Habitat Joint Venture Property Securement Strategy in Nova Scotia.
- Compatibility of delayed cutting regime with bird breeding and hay nutritional quality.

- Inter-regional habitat-relationship models for grassland birds breeding in agro ecosystems.

Assessment

The NS-EHJV Steering Committee will assess the progress towards achieving the NS-EHJV Implementation Plan's goals annually. Assessment review will be driven by detailed annual reports prepared by EHJV partners. Assessment outcomes will be used to renew key waterfowl species lists, population objectives and habitat conditions. Effective assessment will also be a valuable tool to renew strength within the EHJV partnership.

COORDINATION

Coordination includes the planning and administrative related duties carried out by partner staff (i.e. EHJV Chair, EHJV Coordinator, NS-EHJV Program Manager etc.), whose activities are not directly attributed to an on-the-ground deliverable. Examples include: JV Board meetings; provincial, national and international meetings, program development, reporting, etc.

RESOURCE NEEDS

Approximately \$12,255,000 of funding resources (direct and indirect) is required to deliver the conservation actions needed to meet the habitat and population goals outlined in this plan (Table 38). More than 80% of the overall resource needs are projected for securement (\$3,685,890) enhancement (\$5,144,500) and management (1,035,000%). Stewardship, coordination, evaluations, policy and communications activities make up the remaining costs (\$2,390,000).

The NS-EHJV partners estimate that a resource deficit of over \$5,200,000 will occur if NS-EHJV funding levels are not increased from historic levels achieved over the past five years (Table 39). The largest deficits would occur in enhancement (\$3,902,984) and securement (\$858,516). These resource deficits will significantly reduce the delivery of activities outlined in this plan. Significantly more resources are required to deliver the conservation actions outlines in this plan.

Action: The NS-EHJV Steering Committee will strive to expand existing partnership resources and attract other resources outside of the regular NS-EHJV partnership in order to effectively deliver the activities required to meet the habitat and population goals of this plan.

Table 38. Five Year Resource Needs and Waterfowl benefits for Nova Scotia EHJV – All Ecoregions.

Activity	Hectares	Projected Resource Needs **	Waterfowl Benefits	Key Waterfowl Species	% of Total
Securement					
Fee Simple					
Coastal Islands	302	\$2,663,640	Breeding,	COME, ABDU, MALL, AGWT,	21.73 %
Salt Marsh	200	\$330,750	Staging,	RNDU, CAGO	2.70 %
In-holdings	100	\$294,000	Wintering		2.40 %
Owners Unknown	1,250	\$300,000	Breeding	ABDU, MALL, AGWT, RNDU	2.45 %
DU Donations	350	\$97,500			0.80 %
Agreements	1,735	Included in enhancement	Breeding	ABDU, MALL, AGWT, RNDU	
Total Securement	3,937	\$3,685,890			30.08 %
Stewardship (Influenced hectares)	6,000	\$600,000	Breeding	ABDU, MALL, AGWT, RNDU	4.90 %
Enhancement					
Rural Wetland Restoration	200	\$1,134,800	Breeding	ABDU, MALL, AGWT	9.26 %
Agriculture Biodiversity	50	\$400,000	Breeding	ABDU, MALL, AGWT, RNDU	3.26 %
Large wetland restoration - includes DUC rebuilds	500	\$2,847,000	Breeding	ABDU, MALL, AGWT	23.23 %
Municipal wetland restoration	50	\$279,750	Breeding	ABDU, MALL, AGWT	2.28 %
Beaver pond	100	\$93,200	Breeding	ABDU, MALL, AGWT, RNDU	0.76 %
Tidal Wetland restoration	50	\$139,750	Breeding	ABDU, MALL, AGWT	1.14 %
Intensive Wetland Management	1000	\$250,000	Breeding	ABDU, MALL	2.04%

Total Enhancement	1950	5,144,500			41.98 %
Management	13,846	\$1,035,000	Breeding, Staging, Wintering	COME, ABDU, MALL, AGWT, RNDU, CAGO	8.45 %
Communication		\$40,000			0.33 %
Evaluation		\$400,000			3.26 %
Policy		\$150,000			1.22 %
Coordination		\$1,200,000			9.76 %
TOTAL	*	\$12,255,390			

* Hectares are not additive; enhanced and managed hectares are hectares that have been previously secured.

** Resource needs are subject to change pending financial and real estate market values.

Table 39. Resource Variance based on Past 5 Year Expenditures and Projected 5 Year Resource Needs

NS-EHJV Activity	2002-2007 Past 5 Year Resource Expenditures *	2007-2012 Projected 5 Year Resource Needs	Variance
Securement	2,827,374	3,685,890	(858,516)
Stewardship	645,786	600,000	45,786
Enhancement	1,241,516	5,144,500	(3,902,984)
Management	365,883	1,035,000	(669,117)
Communication	78,601	40,000	\$38,601
Evaluation	539,067	400,000	\$139,067
Policy	19,619	150,000	(130,381)
Coordination	1,290,221	1,200,000	\$90,221
TOTAL	\$7,008,067	\$12,255,390	(\$5,247,323)

* Data from National Tracking System (NTS).

Note: Numbers in (brackets) represent 5 year forecast resource deficits based on actual partner expenditures over past 5 years.

INTEGRATION WITH OTHER BIRD CONSERVATION INITIATIVES

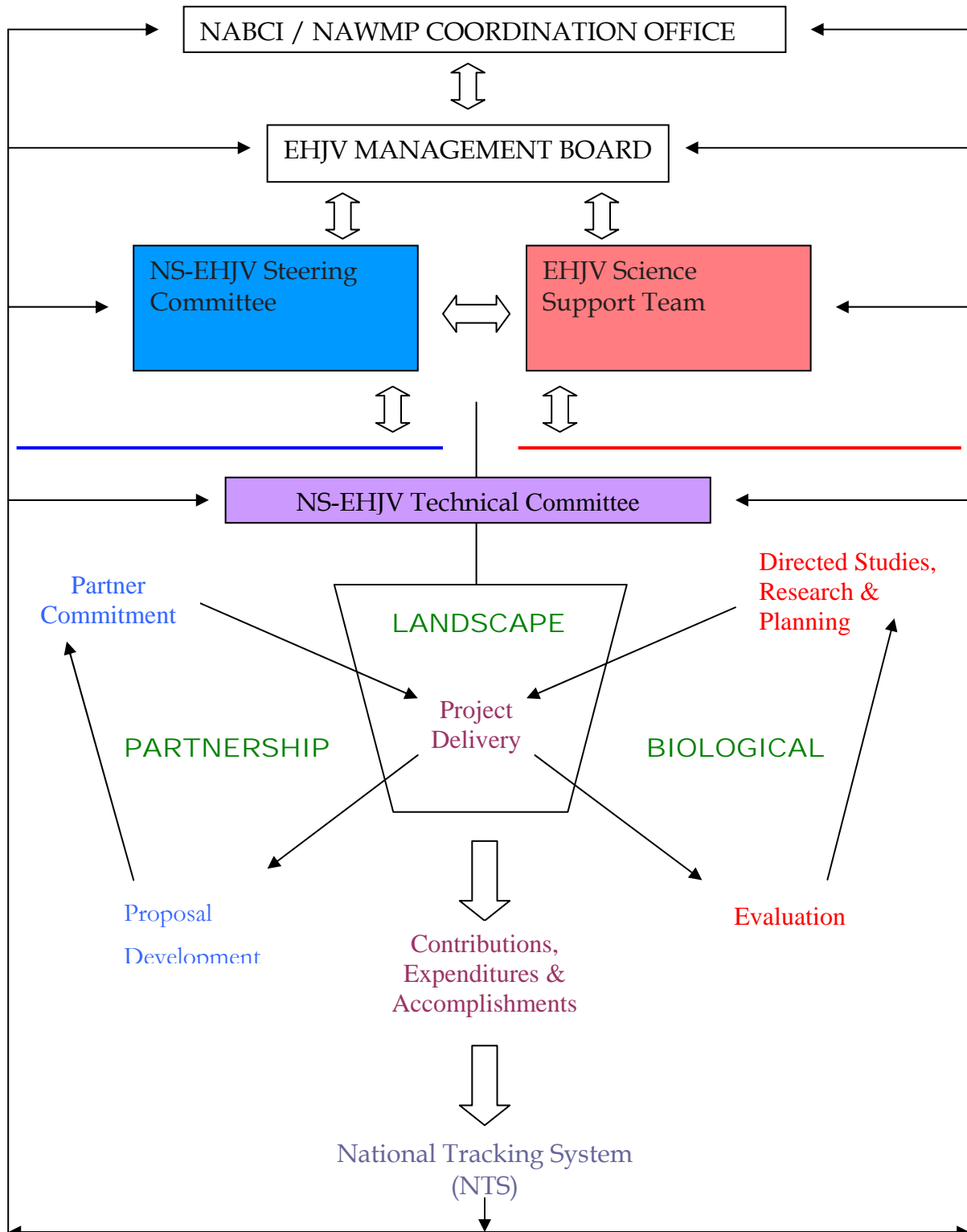
The following came directly from A Strategic Framework for the Delivery of the Eastern Habitat Joint Venture Program

In Canada, implementation of conservation plans under NABCI will follow development of the other three bird initiatives: Canadian Shorebird Plan (CSP) for shorebirds; Wings Over Water (WOW) for sea birds, marsh birds and colonial birds; and Partners in Flight (PIF) for landbirds. There are natural links and enhanced opportunities for delivery of programs specifically aimed at the conservation of shorebirds and waterbirds, however, opportunities for linkages with PIF are less obvious. The EHJV can work with its partners to influence activities on habitats important to species covered under these plans until the other plans are funded and ready for implementation.

Under the present structure, with significant NAWMP funding being provided through the North American Wetlands Conservation Act (NAWCA), waterfowl and their habitats remain a clear priority of the EHJV. **Implementation of the other bird initiatives by an expanded EHJV partnership will be undertaken as plans are completed and funding becomes available.** In the interest of getting the other bird initiatives operational, the EHJV may facilitate the completion of these other plans, and their integration, by providing technical assistance and limited funding. However, it is unlikely that the EHJV will become heavily involved in their implementation, unless there is a strong overlap with existing programs, until additional sources of funding become secured. Once the plans are completed, the EHJV could become the delivery arm of the other plans and provide funding to support "first step" projects that are compatible with the NAWCA funding guidelines while additional funding and resources are acquired. The EHJV Board must be linked into national and international level activities and viewed as the delivery agent responsible for the delivery of other bird initiatives with implementation carried out at the provincial level.

IMPLEMENTATION PROCESSES AND RELATIONSHIPS

Figure 23. NS-EHJV Flowchart.



The following information was adopted from EHJV Structure and Function in Relation to NAWMP – April 1996

Governance

The NS-EHJV Steering Committee (Appendix III) holds the governance responsibility of the EHJV in Nova Scotia. Membership is composed of one representative (or alternate) from each funding partner plus the NS-EHJV Program Manager and EHJV Regional Coordinator. The NSDNR Director of Wildlife Chairs the NS-EHJV Steering Committee. The NS-EHJV Steering Committee oversees all aspects of the planning and implementation of NS-EHJV initiatives by:

- Determining overall strategic direction for the program.
- Following guidelines outlined in the Solicitation Package for Canadian NAWCA Proposals.
- Reviewing and approving all plans associated with the program and ensuring that strategic, long term, and annual work plans are established.
- Ensuring that all projects are properly screened and approved by the relevant regulatory processes and/or agencies.
- Establishing annual expenditure plans, negotiating cost sharing arrangements and overseeing financial arrangements.
- Developing legal arrangements for implementation.
- Providing accounting to all partners on actual expenditures for input into the National Tracking System.
- Ensuring that an appropriate implementation structure and process is in place for each approved project.
- Ensuring that appropriate evaluations activities are implemented in accordance with the EHJV evaluation plan.
- Providing direction to the NS-EHJV Technical Committee and Program Manager.
- Implementing the policies, procedures and directions of the EHJV Management Board with the required documentation of plans, project evaluations, expenditures, etc.
- Developing communication strategies and plans.
- Ensuring that all partners receive full recognition for their contributions
- Promoting the EHJV program provincially, nationally, and internationally as appropriate.

The NS-EHJV Technical Committee (Appendix III) is responsible for the development of technical aspects of the NS-EHJV and the implementation of approved projects. Membership is composed of one representative (or alternate) from each funding partner plus the NS-EHJV Program Manager. The Manager of the NSDNR Wetlands and Coastal Habitat Program Chairs the NS-EHJV Technical Committee. Specific responsibilities of the committee include:

- Input into development of implementation plans.
- Develop, review and recommend project proposals under approved programs.
- Participate in evaluation and planning as required.
- Advise and/or form a Project Management Committee to implement various projects as required

The EHJV Science Support Team is responsible for coordinating the priority research, directed studies and evaluations projects associated with strengthening the biological foundation of the EHJV program.

Administration

Administration of the NS-EHJV is the responsibility of the NS-EHJV Program Manager in close association with all partners. The duties of the NS-EHJV Program Manager are:

- Secretary to the NS-EHJV Steering and Technical Committees’.
- Coordinate the development of provincial project proposals.
- Coordinate the development of implementation plans.
- Promote the EHJV within the provincial government.
- Solicit new partners.
- Coordinate the delivery of the EHJV Program.
- Database Manager for the National Tracking System.
- Facilitate the development of project management committees as required.

Relationship to Other Joint Ventures

The activities outlined in this implementation plan link directly with the goals of the Black Duck Joint Venture by enhancing American black duck populations through conservation of wetland and associated upland habitat.

The activities in this implementation plan also complement the goals of the Sea Duck Joint Venture by conserving coastal island habitats for common eider.

The activities links with the goals of the Atlantic Coast Joint Venture by conserving habitat for waterfowl including American black duck, mallard, green-winged teal, blue-winged teal, Canada goose and mallard in the Atlantic Flyway.

FUNDING SOURCES

The total partner contribution (direct and in-kind) to the NS-EHJV Program since 1986 is \$19,985,684 (National Tracking System Contribution Online Reports). As a group, non-government organizations from Canada and the United States contributed the most to the program, followed by the United States Government, NS Provincial Government, Canadian Government and others (see Table 40).

Table 40. Partner Contributions from 1986-2006 to NS-EHJV Program (NTS Online Report)		
Partner Group	Group Funding Amount	Percentage of Total
Non-Government Organizations (Canada and USA)	8,115,493	41%
USA Government	6,098,907	31%
NS Provincial Government	2,671,990	13 %
Canada Federal Government	2,593,752	13%
Others (academic, corporate, landowners etc)	505,542	2%
TOTAL	\$19,985,684.00	100%

NS-EHJV partners are projected to contribute over \$12,000,000 over the next five years to delivery of the activities outlined in this implementation plan. Government and non-government organizations are expected to be the greatest contributors (Table 41). However, corporate contributions are expected to increase as greater efforts are afforded to expanding corporate partnerships. **Efforts to bring other government and non-government organizations into the NS-EHJV will also be expanded as links to other bird initiatives are developed.**

Table 41. Projected Major Contributors	
Non-Government Organizations	
Ducks Unlimited Canada	
Ducks Unlimited Inc.	
Nature Conservancy of Canada	
The Nature Conservancy	
Nova Scotia Nature Trust	
Wildlife Habitat Canada	
Nova Scotia Government	
Nova Scotia Department of Natural Resources	
Nova Scotia Department of Agriculture and Fisheries	
Government of Canada	
Environment Canada	
Agriculture and Agri-Food Canada	
United States Federal Government	
U.S. Fish & Wildlife Service	

APENDIX 1 – Atlantic Flyway

Nova Scotia is located in the maritime zone of Atlantic Canada, along the coastal edge of the Atlantic flyway (Image 20-A).

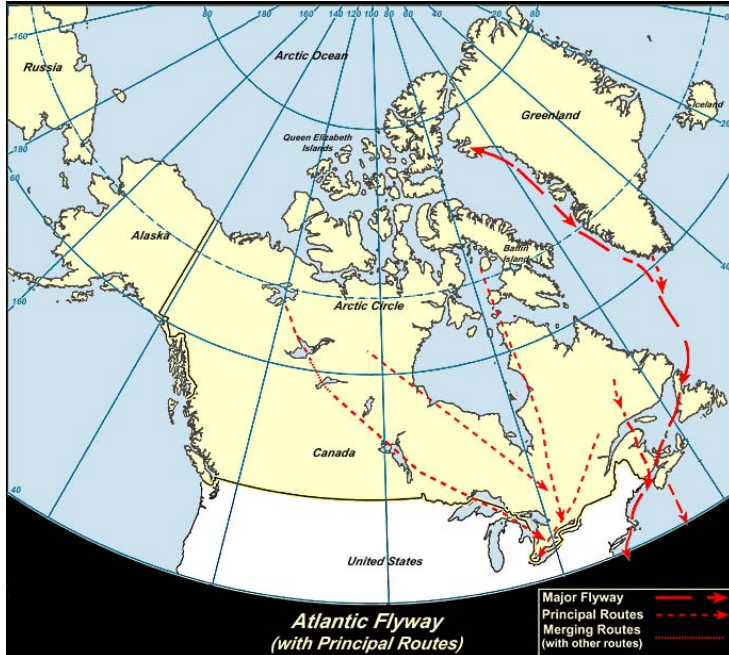


Image 20-A. Atlantic Flyway Routes from <http://www.birdnature.com/upperatlantic.html>

APPENDIX II - Bird Conservation Regions and Waterfowl Conservation Regions

The following information came from the North American Bird Conservation Initiative web site at <http://www.bsceoc.org/international/bccanada.html>

Bird Conservation Regions (BCRs) are part of the North American Bird Conservation Initiative (NABCI). BCRs are ecologically defined units that provide a consistent spatial framework for bird conservation across North American landscapes. BCRs are being used to help assign "conservation priority" scores for bird species. Each BCR, regardless of internal political boundaries, has its own unique list of "priority" species. Species contained on a given BCR list are ranked by conservation importance according to a standardized set of criteria determined by partners from Mexico, the United States and Canada.

Nova Scotia is located within **BCR 14 -Atlantic Northern Forest**. In Canada BCR 14 follows South of the St Lawrence seaway from Quebec City northeast to include New Brunswick, PEI, and Nova Scotia (Image 21-A).

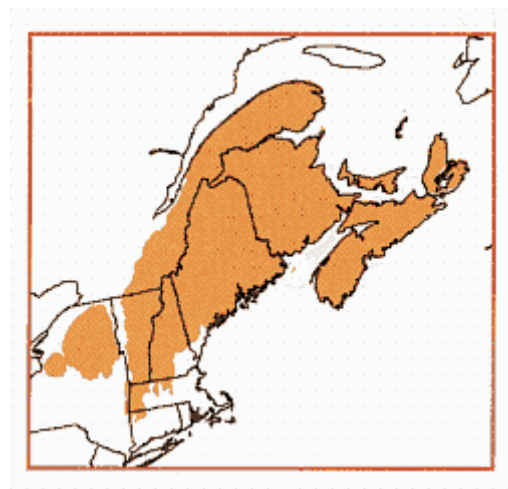


Image 21-A. BCR 14 map from NABCI website at <http://www.bsceoc.org/international/bccanada.html>

BCR 14 Atlantic Northern Forest: The nutrient-poor soils of northernmost New England and the Adirondack Mountains support spruce-fir forests on more northerly and higher sites and northern hardwoods elsewhere. Virtually all of the world's Bicknell's Thrush breed on mountain tops in this region. Other important forest birds include the Canada Warbler and Bay-breasted Warbler. Coastal wetlands are inhabited by Nelson's Sharp-tailed Sparrow; rocky intertidal areas are important for wintering Purple Sandpipers; and muddy intertidal habitats are critical as Semipalmated Sandpiper

staging sites. Common Eiders and Black Guillemots breed in coastal habitats, while Leach's Storm-Petrels, gulls, terns and the southernmost populations of many breeding alcids nest on offshore islands. Beaver ponds and shores of undisturbed lakes and ponds provide excellent waterfowl breeding habitat, particularly for American Black Duck, Hooded and Common Mergansers, and Common Goldeneye. The Hudson and Connecticut River valleys are important corridors for Brant, Green-winged Teal, and other waterfowl migrating from New England and Quebec. Because inland wetlands freeze, coastal wetlands are used extensively by dabbling ducks, sea ducks, and geese during winter and migration.

Waterfowl Conservation Regions (WCR 14)

The following information was adopted from the NAWMP 2004 Implementation Framework.

- The North American Waterfowl Management Plan Science Support Team (NSST) modified the existing Bird Conservation Regions (see above) to better reflect the abundance and diversity of waterfowl across North America. These “Waterfowl Conservation Regions” (WCRs) are the NAWMP’s geographic units for prioritization at the regional scale. Waterfowl conservation regions cover the continent. Nova Scotia is located in **WCR 14 - Atlantic Northern Forest**.

APPENDIX III - GOALS AND CONSERVATION ACTIONS SUMMARY

Waterfowl Population Goals

Ten-year waterfowl population goals (breeding, wintering, staging and molting) were established for NS-EHJV priority waterfowl species (American black duck, mallard, common eider, green-winged teal, and Canada goose).

Species	10 Year Population Goals *			
	Breeding (IBP)	Wintering (Individuals)	Staging	Molting (Individuals)
American black duck	37,000 ↑	20,000 ↑	**	N/R
Mallard	2,000 ↑	**	**	N/R
Common eider	12,000 ↑	10,000 ↔	**	40,000 ↔ ***
Ring-necked	7,500 ↑	N/R	**	N/R
Green-winged teal	4,000 ↑	N/R	**	N/R
Canada goose (NAP)	N/R	15,000 (NAP and resident combined) ↔	**	N/R
Canada goose (resident)	Population Goal - Not higher than 2006 levels. ↔		N/R	N/R

IBP = Indicated Breeding Pairs

* These goals were established with data available from current surveys.

** Insufficient data available to estimate goal.

N/R = Not relevant

*** Based on 2002 molting survey results

↑ = Population goal represents an increase from current population estimates

↔ = Population goal is equal to current population estimates

Conservation Actions

Securement:

- Fee simple acquisition will be directed at:
 - Securing 7 privately owned islands (estimated at 302 ha). This action will contribute to achieving the waterfowl population goals for Nova Scotia by maintaining the present and future availability of critical breeding habitats for common eider.
 - Securing 10 large contiguous salt marsh and associated upland (200 ha). This action will contribute to achieving the waterfowl population goals for Nova Scotia by maintaining present and future important brood rearing, staging and wintering habitat for American black duck, mallard, green-winged teal and Canada goose.

- Securing 100 hectares of coastal private holdings within the coastal conservation areas of the Atlantic Coast Ecoregion. This action will contribute to achieving the waterfowl population goals for Nova Scotia by reducing the likelihood of human related disturbances to coastal habitats and maintaining important brood rearing, staging and wintering habitat for American black duck, mallard, green-winged teal and Canada goose.
- The Owners Unknown Acquisition Project will be directed at acquiring an additional 1,250 hectares of freshwater and coastal wetlands and coastal. This action will contribute to achieving the waterfowl population goals for Nova Scotia by maintaining important brood rearing, staging and wintering habitat for American black duck, mallard and green-winged teal, Canada goose and common eider.
- Donations will be directed at acquiring an additional 350 hectares of freshwater and coastal wetlands and coastal islands. This action will contribute to achieving the waterfowl population goals for Nova Scotia by maintaining important brood rearing, staging and wintering habitat for American black duck, mallard and green-winged teal, Canada goose and common eider.
- Conservation Agreements will be signed on all private land wetland restoration projects delivered over the next five years and will result in the securement of 1,950 ha of restored wetlands.

Stewardship

- The NS-EHJV Wetland Stewardship Program will complete 150 Agricultural Biodiversity Conservation Plans on NS farms. These actions will contribute to achieving the waterfowl population goals for Nova Scotia by influencing positive land use practices to support and maintain critical breeding habitat for American black duck, mallard, green-winged teal, ring-necked duck and Canada goose.

Enhancement

- Wetland restoration activities will result in 1,950 ha of restored wetlands over 5 years. The waterfowl response to these restored wetlands will accumulate as the program is deployed across the landscape. These actions will contribute to achieving the waterfowl population goals for Nova Scotia by restoring breeding habitat for American black duck, mallard, green-winged teal, and ring-necked duck.

Enhancement Program	Ha
Rural wetland restoration	200
Agriculture Biodiversity	50
Large wetland restoration	500
Municipal wetland restoration	50
Beaver pond	100
Salt marsh restoration	50
Intensive Wetland Management	1000
Total	1950

Management

- Habitat management will occur throughout all Ecoregions on existing NAWMP projects (currently 13,846 hectares). This action will contribute to achieving the waterfowl population goals for Nova Scotia by maintaining critical wetland and associated upland habitat for breeding, wintering and staging.

APPENDIX IV - NS-EHJV Steering Committee / Technical Committee

NS-EHJV Steering Committee (2006 membership)			
Organization	Committee Member	e-mail	Telephone
Environment Canada	Keith McAloney	keith.mcaloney@ec.gc.ca	(506) 364-5013
Ducks Unlimited Canada	Deanne Meadus	d_meadus@ducks.ca	(902) 667-8726
Nature Conservancy of Canada	John Foley	John.Foley@natureconservancy.ca	(506) 450-6010
NS Department of Agriculture	Andrew Cameron	CAMEROAD@gov.ns.ca	(902) 424-0406
NS Department of Natural Resources	Julie Towers*	towersjk@gov.ns.ca	(902) 679-6139
NS-EHJV Program Manager	Glen Parsons	parsongj@gov.ns.ca	(902) 679-6223
EHJV Coordinator	Vacant		

* Committee Chair

NS-EHJV Technical Committee (2006 membership)			
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APPENDIX V – Literature

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