Habitat Conservation Plan for the Town of Channel-Port aux Basques

Prepared with assistance from the
Department of Environment and Conservation
Wildlife Division
2014

Habitat Conservation Plan
for the Town of Channel-Port aux Basques

July 2014

Prepared with assistance from the
Department of Environment and Conservation- Wildlife Division

Contact Information:

Town of Channel-Port aux Basques
P.O. Box 70
Channel-Port aux Basques, NL
A0M 1C0
Phone: (709) 695-2214
Fax: (709) 695-9852
Email: info@portauxbasques.com

NL Eastern Habitat Joint Venture
Department of Environment and Conservation - Wildlife Division
117 Riverside Drive, P.O. Box 2007
Corner Brook, NL
A2H 7S1
Tel: (709) 637-2006
Fax: (709) 637-2032

PREFACE

In Newfoundland and Labrador, some of the wildlife that are in greatest danger of being negatively impacted are those influenced by residential, commercial and industrial activities within the vicinity of municipalities. In this province, the primary focus of the Eastern Habitat Joint Venture is to conserve valuable wildlife habitat through Stewardship Agreements. The Town of Channel-Port aux Basques was identified as having just such ecologically valuable, and unique, wetland, dune and beach habitat located within its municipal boundaries.

The Town of Channel-Port aux Basques signed a stewardship agreement on August 20, 2003 pledging their commitment to conservation and protection of wetlands within designated areas known as "Management Units" as well as promoting 'wise use' of surrounding coastal areas. In accordance with this agreement, Channel-Port aux Basques manages designated areas with technical advice provided by the provincial Wildlife Division, in part via this Habitat Conservation Plan. With the signing of this plan, the agreement parties officially accept this Habitat Conservation Plan and agree to use it as a guide to govern activities within the designated areas.

The following signatories agree to work towards the implementation of the following "Habitat Conservation Plan" for the Town of Channel-Port aux Basques:

Lloyd Thistlewood
Mayor

Bruce Burton
Witness

Sept 3, 2014
Date

Sept 3, 2014
Date

Wildlife Division
Department of Environment and Conservation

Jan 14/15
Date

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

Page

Section 1: Plan Overview

Plan Purpose: The Town of Channel-Port Aux Basques will use this Conservation Plan as a guide to govern activities which impact wildlife and wildlife habitat in order to minimize negative impacts within the areas designated for conservation.

Plan Goals: (1) To conserve wetlands located within the designated Management Unit(s) and to promote "wise use" of wetlands, dunes and beaches located within designated Stewardship Zone(s).

(2) To maintain and/or increase wildlife use of those areas, particularly by avian species.

(3) To increase public awareness of the importance of habitat conservation to maintain wildlife populations.

Plan Objectives: (1) To present a general assessment of the habitat and associated wildlife species designated for conservation.

(2) To recommend protection, conservation and enhancement strategies for both the Stewardship Zone and Management Unit(s).

(3) To describe potential initiatives for education and awareness among the public in order to increase support and cooperation of the Town's citizens.

Section 2: Wetland and Coastal Conservation in Newfoundland and Labrador

Wetland Conservation

Human development has resulted in the destruction of many types of habitat all over the world. Wetlands are among the areas most critically affected by this development and are, in fact, one of the most sensitive ecosystems on the planet. Wetlands are unique ecosystems that often occur at the edge of aquatic (water, fresh or salty) or terrestrial (upland) systems. They may be wet year-round, wet during certain seasons, or wet during part of the day. In general, "wetland" refers to land that has the water table at, near, or above the land's surface and refers to land which is saturated for a long enough period to promote wetland processes. In addition to bogs and swamps, wetlands include tidal marshes, forested wetlands, fens, estuaries and shallow open water (at a depth less than two meters). Healthy wetlands and associated uplands contain fresh, brackish or salt water and are some of the most biologically diverse and productive ecosystems on earth.

Wetlands play a major role in the status of continental ecosystem health, as well as regional and local ecosystem health. Wetlands serve as important buffers to flooding, function as enormous sinks for carbon and as natural reservoirs for the holding, purifying and recharging of water resources. From an economic stance, wetlands are associated with a range of values from recreational and subsistence opportunities for hunting, fishing, trapping for food and fur, the gathering of fruit and berries and for non-extractive activities like wildlife viewing, ecotourism, paddling sports and hiking. Wetlands also provide for the seasonal resource requirements of many waterfowl species and serve as important habitat for waterfowl throughout breeding, feeding, staging and over-wintering. All migratory waterfowl, many other migratory birds, and half of all threatened and endangered species depend on wetlands and associated upland habitat for their existence.

The number and diversity of North America's wildlife species has been declining over the latter half of the twentieth century. At least a portion of this decline can be directly attributed to the loss of natural habitats to urban, industrial and agricultural expansion. Wetlands have historically been among those areas most critically impacted by human development. Canada, the United States and Mexico have signed the North American Waterfowl Management Plan (NAWMP), thereby committing to a long-term program of partnership projects aimed at assuring the survival and increase of waterfowl populations and protecting the wetland habitat on which their survival depends. A number of joint ventures, ranging from species to regional-specificity, have been established to achieve and implement the objectives of the NAWMP. The province of Newfoundland and Labrador, through the provincial Wildlife Division, became a partner of the Eastern Habitat Joint Venture (EHJV) in 1989.

Coastal Conservation

Coastal habitats, including offshore islands, saltwater marshes/ponds, beaches, and surrounding dune systems are also significantly ecologically sensitive and commonly impacted by human development throughout the world. These areas play a major role in the status of continental ecosystem health, as well as regional and local ecosystem health. However, human activities have already altered and damaged a significant proportion of the world's and Newfoundland and Labrador's coastal landscape.

Coastlines provide excellent habitat for all kinds of both common and rare animals and plants. Significant among these is providing breeding, moulting, staging and wintering habitat for waterfowl, sea ducks, seabirds and shorebirds. Newfoundland and Labrador has many harbours, bays and offshore islands which support a significant population of breeding waterfowl, seabirds, sea ducks and shorebirds. In fact, colonial nesting birds such as common eider, Atlantic puffin, murre, razorbill, and Leaches storm-petrel nest exclusively on offshore islands. Additionally, the Harlequin duck, a species at risk, winters and feeds along exposed rocky headlands and reefs of coastal islands.

Newfoundlanders and Labradorians have a strong cultural connection to the ocean and its surrounding coastlines. Much of our economic history is tied to coastal dependent industries, such as fishing, oil and gas development, aquaculture production and pulp and paper mills. These industries often play a large role in the economies of small coastal communities. Coastal areas have long provided residents with opportunities to pursue traditional activities such as hunting, fishing, boating, hiking and berry-picking, and non-traditional activities such as bird-watching. Today, the eco-tourism industry is starting to introduce visitors to these special places. None of these activities are bad by themselves but they have the potential to have a negative impact on local sea duck, seabird and shorebird populations if not carried out with care.

The principal goal of Coastal Habitat Stewardship is to help make municipalities, corporations, developers, landowners and other habitat stakeholders more aware of the value of coastal habitat and the species that live there and to empower them to undertake their own actions to conserve this habitat. Its central premise is that each person has the responsibility and opportunity to contribute towards the sustainability of our sea duck, seabird and shorebird populations so that we may continue to enjoy the privileges associated with both our consumptive and non-consumptive use of our outdoor resource. This individual stewardship also helps to lead to more informed decision-making and works towards minimizing negative impacts on coastal habitat and local ecosystems as a whole.

Coastal Habitat Stewardship focuses primarily on sea ducks, sea birds and shorebirds. Sea ducks represent one-third of all North American waterfowl species but originally received no special consideration under the original North American

Waterfowl Management Plan because their populations were thought to be stable. The biology of sea ducks and most sea birds differs from most other birds in that their life spans are longer, most species breed later, lay fewer eggs and, on average, produce fewer young per year. Analysis of existing survey and harvest data along with new surveys conducted during the 1990's have indicated population declines in 10 of the 15 species of North American sea ducks. This alarming fact precipitated the formation of the Sea Duck Join Venture (SDJV) in 1998 whose mission is to promote conservation of North American sea ducks.

Eastern Habitat Joint Venture (EHJV)

The premise behind the EHJV is to conserve, enhance and restore wildlife habitat for all-bird species, in particular wetlands for waterfowl, in the six eastern Canadian provinces including Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador. Each province deals with wildlife habitat conservation issues slightly differently, depending on the unique requirements of each province and individual habitat concerns. Each provincial program, coordinated by a separate program manager, involves the cooperation of international partners, including government agencies and non-government groups, each working to forward specific goals and objectives of the NAWMP. In Newfoundland and Labrador, the program is administered through the provincial Wildlife Division of the Department of Environment and Conservation. Its local contributors, other than the province, include Ducks Unlimited Canada, Canadian Wildlife Service, Nature Conservancy of Canada and Wildlife Habitat Canada. While each province may function independently, the EHJV works towards attaining common goals of influencing wildlife habitat quality and quantity in Eastern Canada through conservation, enhancement and/or restoration initiatives.

NL Stewardship Program

Wildlife habitat, in particular wetlands and coastal areas, has historically been affected by heavy development pressure. In Newfoundland and Labrador development pressure occurs regularly and most often within municipal boundaries. As such, wetlands and coastal habitat that exist within municipal boundaries are often at the greatest risk of destruction or alteration and often in greatest need of conservation and/or management. The NL Department of Environment and Conservation's Wildlife Division implements a Stewardship Program, which has become one of the most successful components of the ongoing implementation of the Eastern Habitat Joint Venture in Newfoundland and Labrador. The program's principle goal is to help make municipalities, corporations, developers, landowners, and other wildlife habitat stakeholders more aware of the value of wetlands and coastal habitat within their jurisdiction and to empower them to take action to conserve these areas. This leads to more informed development decision-making and works towards minimizing negative impacts on local ecosystems as a whole.

The Stewardship Program focuses largely upon signing Stewardship Agreements with municipalities, corporations and individual landowners who own or manage significant wildlife habitat. A Stewardship Agreement represents a formal public commitment by a community, corporation, individual and the province, to act together to conserve habitat for wildlife. By signing a Stewardship Agreement, communities, corporations and individuals become an important link in a continental chain of conservation areas. Since 1993 thirty-three municipalities in the province, including Whitbourne, Gander, Carmanville, Come By Chance, Stephenville Crossing, Spaniard's Bay, Bay Roberts, Torbay, Winterland, Springdale, Gambo, Grand Falls-Windsor, Channel-Port aux Basques, Happy Valley-Goose Bay, St. John's, Wabush, Labrador City, Hawke's Bay, Deer Lake, Flatrock, Burgeo, St. Anthony (Hare Bay), Mary's Harbour, St. Lewis, Red Bay (St. Peter's Bay), Flower's Cove, Port aux Choix, Cartwright (Table Bay), Steady Brook, Bonavista, Frenchman's Cove, Garnish and St Lawrence have become involved through the signing of Municipal Habitat Stewardship Agreements. Corporate Stewardship Agreements have also been signed by the Iron Ore Company of Canada and Corner Brook Pulp and Paper Limited. Private landowners in several of the communities surrounding the Grand Codroy Estuary (an estuary of international significance) as well as Burgeo have also been involved with the signing of Landowner "Good Steward" Agreements, demonstrating individual commitment to local wetlands and waterfowl habitat.

The Stewardship Agreement Process

Initial contacts are generally sought by both Wildlife Division staff and local community leaders who wish to take action to conserve coastal, wetland and/or upland habitat. A determination is made between the parties of whether there exists mutual interest in pursuing a Stewardship Agreement (Agreement shown in Appendix 1). Surveys within a certain area of interest are carried out by the Wildlife Division to confirm that a significant relationship exists between coastal, wetland or upland habitat and local wildlife using those areas.

Following these positive assessments, more intensive field investigations will be carried out to determine and agree on formal boundaries for "Management Units". Management Units are intended to be incorporated/zoned as environmentally "sensitive areas", "conservation areas" or "protected areas" within municipal planning documents and associated development regulations as governed by the Urban and Rural Planning Act (2000). These areas are, consequently, set aside by a community, individual or corporation in an effort to prevent habitat alteration and diminished ecological function or degradation that might be caused by development.

When sufficient information has been gathered, a preliminary proposal is presented to a community, individual or corporation for review, with suggested boundaries for Management Units clearly indicated (Maps found in Appendices 2 & 3). After the Management Units have been agreed upon by all parties, a formal Stewardship Agreement will be signed between the presiding body (town, corporation, or

landowner) and the province. Under this agreement, the town, corporation or landowner maintains ultimate control over all areas under its jurisdiction, but are asked to abide by the details of the Stewardship Agreement.

After the signing of a formal agreement, Wildlife Division staff will assist the community, corporation or individual in preparing an area specific Habitat Conservation Plan. This plan will serve to offer best management practices and will provide recommendations and advice for conserving, enhancing and/or managing the wildlife habitat contained within a body's area of authority. More generally, a Stewardship Agreement is signed with the idea that when land use decisions are made, the value of wildlife habitat will not be forgotten and that future land-use activities will not have a negative impact upon these values.

Roles of Stewardship Agreement Signatories

"The Province"- The Minister of Environment and Conservation is the designated signatory on behalf of the province. The Wildlife Division administers the Eastern Habitat Joint Venture in Newfoundland and Labrador. As such, staff of the Wildlife Division are assigned to implement, on a provincial basis, the NL Stewardship Program.

As a result of signing a Stewardship Agreement, staff of the Wildlife Division are expected to:

- Provide the agreement signatory with technical advice and assist in the development of a Habitat Conservation Plan.
- Review proposed developments within the Management Units that have the potential to impact that wildlife habitat.
- Assist in carrying out, where appropriate, education and information initiatives to raise awareness of wildlife, wetland and coastal related issues, and
- Support community conservation groups in implementing the Stewardship Agreement and Habitat Conservation Plan.

As a result of signing a Municipal Habitat Stewardship Agreement, the Municipality and its designated Mayor/Council are expected to:

- Ensure that significant wildlife habitat areas designated as Management Units are protected from destruction or degradation and to contact the Wildlife Division in a timely manner when activities are proposed that may impact that habitat.
- To promote "wise use' of the stewardship zone by residents as outlined in this plan.
- Incorporate the Stewardship Agreement and Habitat Conservation Plan into its next Municipal Plan draft or revision with the assistance of the Wildlife Division.

- Educate residents and development planners about the stewardship program and their responsibilities, with the assistance of the EHJV partners.
- Implement, over time, the Habitat Conservation Plan recommendations in the community at large, with the assistance of the EHJV partners.
- Participate in the Stewardship Association of Municipalities Inc (SAM), a province-wide organization made up of municipalities which have signed Stewardship Agreements.

Section 3: Wetlands and Coastal Habitat of Channel-Port Aux Basques

Introduction to Channel-Port Aux Basques

The Town of Channel-Port Aux Basques, with a population of ~4,200, is located on the south-west coast of Newfoundland. The town is the central point of entry or "gateway" to the island, via ferry. It is known for its natural, deep water port and in the past was used by the Basques people as a safe-haven in stormy seas. Channel-Port aux Basques was once two separate communities and it wasn't until 1945 that the two were integrated into one.

The town was originally primarily a fishing community and it wasn't until the construction of the NL Railway in 1898 that the town became known more broadly known. The railway connected Port aux Basques to many communities across the island, as far east as St. John's. Today, the town relies more heavily on the shipping industry but also has a number of hotels, restaurants, retail stores and other businesses. Tourism in Port aux Basques is significant due in part to the geographic location, long sandy beaches, the diversity of birds and wildlife, and the rustic setting which allows the town to welcome thousands of visitors each year.

Description of the Stewardship Zone

The Stewardship Zone was created to assist the Town with its decision making; in considering the effects of development on wildlife and generally to promote and define its "wise use". The Stewardship Zone area is approximately 2240 hectares and contains most of the major wetlands, dunes, beaches and salt water marshes within the town boundaries. The area is located west of Grand Bay and extends out to Yankee Point and incorporates islands such as Duck Island and Durands Island. The Stewardship Zone then extends north up to Jerret Point and inland as far as the Trans Canada Highway, excluding the J.T Cheeseman Provincial Park (Appendix 2). These areas are inhabited and utilized by a large number of birds, including waterfowl, shore birds, song birds, raptors, as well as other wildlife and fish including the Vulnerable species Banded Killifish (Fundulus diaphanous).

The Stewardship Zone, from Jerret Point to Yankee Point, is approximately 10km in length and approximately 3.5km in width. The Stewardship Zone includes a number of salt water ponds and marshes, including Saltwater Pond and Pond First Pond (the two areas known for the Banded Killifish), Second Pond, Rocky Barachois, Big Barachois, Shorts Pond and a number of other small ponds, marshes and uplands. Each area contains a wide diversity of vegetation that supports waterfowl, as well as shorebirds, during in their various life stages.

Description of the Management Units

The Management Units cover some 298 hectares of wetland of significance to waterfowl in three ponds. These ponds and marshes and their surrounding vegetated buffers provide prime habitat for nesting and brood rearing of juvenile waterfowl. (See maps in Appendix 2 and lists of observed species in Appendix 3 & 4)

Shorts Pond Management Unit
Shorts Pond is located along the Newfoundland TRailway approximately 1.5km south east of J.T Cheeseman Provincial Park. The pond is approximately 130 meters in width and 300 meters in length and is approximately 36 acres in total. The area provides an important stopover, feeding, nesting, and brood raising site for a number of waterfowl and shorebirds (both locally nesting and migrants). Some species seen frequenting this area include Northern Pintails, Black Ducks, American Wigeons, Great Blue Heron, Green-wing Teal, Northern Harrier, and Sharp-shinned Hawk.

Shorts Pond is the smallest of the three Management Units and consists of a mostly sandy bottom with some vegetation around its edges. Vegetation around the pond includes grasses, moss and softwood vegetation, like black spruce. The ponds shallow water provide good habitat for many aquatic insects and crustaceans that many waterfowl feed. As a Management Unit it has been assigned an associated buffer of 75 meters in order to ensure the adjacent habitat required by the species utilizing it is included.

Figure 1: Shorts Pond Management Unit

Big Barachois Management Unit

This Management Unit, located 2km southeast of J.T. Cheeseman Provincial Park, is approximately 2km in length, 650 meters in width, and has an area of approximately 480 acres. As a Management Unit it has been assigned an associated buffer of 75 meters in order to ensure the adjacent habitat required by the species utilizing it is included. The barachois, containing both fresh and salt water, rises and fall with the tides and contains a very rich food supply. The only separation between most of this large water body and the ocean is a collection of enormous sand dunes. As a result, a large part of the barachois is sheltered from any direct blast off the waters of the Gulf of St. Lawrence. The eastern side of the barachois is bordered by some subtle uplands and wetlands, along with scattered rock outcrops. To the south there is a ridge that rises from bogs and raised fens in the east to a peak just less than a kilometer from the shoreline. Due to the topography, as well as the mixing of fresh and salt water, this location is a significant area for waterfowl, shorebirds, and seabirds. It is being utilized as a nesting and brood raising location for local waterfowl as well as migrant birds.

Species frequenting this area include a rising number of Great Blue Herons, American Black Duck, Common Merganser, Northern Pintail, Ring-necked Duck, Green-winged Teal, Double-crested Cormorant, Yellowlegs, Northern Harrier, Osprey, Black-bellied Plover, and a number of other waterfowl and shorebirds.

Figure 2: Big Barachois

Rocky Barchois Management Unit

This Management Unit is located southeast of Big Barachois and is approximately 1km in length, 600 meters in width and the area is approximately 217 acres in total. As a Management Unit it has been assigned an associated buffer of 75 meters in order to ensure the adjacent habitat required by the species utilizing it is included. This barachois, commonly known as Bottle's Barachois for the beach of the same name to the west, does not have the same intensity of mixing that is seen in Big Barachois, but it has unique habitat and its location makes it a very important area for waterfowl. The area connects a chain of wetlands which run from Rocky Barachois to Grand Bay West. The vegetation in this area changes from stunted spruce trees and low-lying shrubs to a mix of grasses, wildflowers, wild raspberries, and shrubs. The eastern border has bogs and marshes that drain into the barachois and the west portion of the barachois is separated from the ocean by low-lying dunes, and at one point, nothing more then a beach.

This area is a great area for staging and feeding waterfowl as well as a large number of shorebirds, including the endangered Piping Plover. Large numbers of Common Merganser make use of this area, as well as Black Duck, Northern Pintail, Bald Eagle, Lesser Scaup, Semipalmated Plover, Sandpipers, and a number of other waterfowl. This area is also used by hundreds of Canada Geese for a fall staging area on their journey further north.

Figure 3: Rocky Barachois

Section 4: General Policies for Wetland and Coastal Conservation

The Town's Commitment to Stewardship

In signing a Municipal Habitat Stewardship Agreement, the Town has made a public commitment to join an international network of important habitat areas contributing to wildlife presence and abundance in North America. Further, the Town of Channel-Port aux Basque has committed to using this Habitat Conservation Plan as a guide to best management practices in and around wetlands, coastal areas and associated uplands; in particular within the Town's Management Units. Perhaps most significantly, it is hoped that a stewardship ethic will be fostered within the community since the conservation of wildlife habitat depends not wholly on Habitat Conservation Plans or regulations, but on the conservation and stewardship ethic of Town residents and of visitors.

The Management Units will be managed to ensure the maintenance and possibly the enhancement of wetland habitat and waterfowl populations. Managing bodies will include the Town Council and the Department of Environment and Conservation, Wildlife Division.

Benefits for Residents

The strategies outlined in this Habitat Conservation Plan can provide many long term recreational and "quality-of-life" benefits for local residents. Wetland and coastal areas are often ideally suited to a variety of consumptive and non-consumptive recreational activities, including fishing, hiking, canoeing, photography and bird-watching. The Town may wish to use these opportunities to increase tourism to the region. In developing employment, recreational and tourism opportunities, careful consideration for wildlife populations must be included in the planning process. Otherwise, human activities may result in negative impacts to the very resource that is providing the attraction.

Surely the most important benefit that people receive from stewardship is the opportunity to increase their knowledge of wetlands and nature in general. Programs such as the Canadian Wildlife Federation's "Project Wild" foster an increased environmental ethic in youth and adults alike. Many of the enhancement and restoration strategies outlined in this plan can be easily conducted by local community interest groups, thereby allowing "hands on" involvement in conservation efforts.

Management of the Management Units

Activities within the Management Units will be managed whereby permitted activities do not result in the loss of wildlife habitat or wildlife populations. As such, wildlife will be at the forefront of management decisions. Should they be necessary, efforts will be made to reduce pre-existing habitat degradation within Management Units and only activities that have no negative or adverse impact upon wetland and associated upland habitat, and on the associated wildlife using those habitats, should be permitted in these areas. Development proposals which impact habitat or wildlife within the Management Units should be forwarded to staff of the Wildlife Division for comment with a thirty (30) day notice period.

Incorporation of Management Units in Municipal Plans

During the preparation of a draft Municipal Plan, or during the process of Municipal Plan Review, the Town Council shall incorporate the Stewardship Agreement into any resulting Municipal Plan or related "Master Plan". Specifically, the Management Units, and any future Management Units as may be desirable, shall be declared "conservation areas" or some similar consistent zoning designation. If such areas are outside municipal planning boundaries, the town could seek to have them designated "Protected Areas" under subsection 31 of the Urban and Rural Planning Act, 2000.

In approving permits, regulations or by-laws related to the area's designation within a Municipal Plan, or any amendments to a future Municipal Plan which could affect the Management Units, the Town Council will consult with staff of the Wildlife Division providing a thirty (30) day window of notice for comment.

Management by Committee

It is recommended that Town's seek to manage their agreement and the implementation of this Conservation Plan via a formal committee of council. This may take the form of an "Environment Committee" or "Wetlands Committee" generally chaired by a member of council with volunteers from the local community making up the remainder of its membership. It has been our experience that such, often dedicated and dynamic, committees often have greater success in raising the profile of the environment and the wetland protected areas within the larger community, working with council, thereby increasing public understanding and support over the long-term. By involving local individuals a greater sense of ownership is fostered thereby strengthening the conservation commitment.

Stewardship Association of Municipalities Inc. (SAM)

When a municipality signs a Municipal Habitat Stewardship Agreement, it becomes eligible to become a member of the Stewardship Association of Municipalities Inc., also known as "SAM". SAM is an incorporated, non-profit organization whose membership is comprised of Newfoundland and Labrador municipalities. Each member municipality has also made a formal commitment to the conservation of habitat and biodiversity within their municipal planning boundaries by signing a Municipal Habitat Stewardship Agreement with the provincial Department of Environment and Conservation. Provincial agreement signatories, in addition to Channel-Port aux Basques, currently consist of 33 municipalities including Bonavista, Flatrock, Gander, Whitbourne, Carmanville, Come By Chance, Stephenville Crossing, Grand Falls-Windsor, Spaniard's Bay, Bay Roberts, Torbay, Winterland, Springdale, Gambo, Happy Valley-Goose Bay, St. John's, Wabush, Labrador City, Hawke's Bay, Steady Brook, Deer Lake, Port Aux Choix, Flower's Cove, St Anthony, Red Bay, St Lewis, Cartwright, Mary's Harbour, Frenchman's Cove, Garnish, St Lawrence, and Burgeo.

SAM member municipalities together seek to secure, enhance and restore important wildlife habitat in the province while balancing municipal development with conservation. SAM also represents its members on issues of common concern related to provincial wildlife habitat conservation. Additionally, as part of the implementation of their individual Municipal Plans, Stewardship Agreements and associated Habitat Conservation Plans, member municipalities seek to educate and engage residents, particularly youth, in environmental stewardship and conservation. This is in recognition that the involvement and support of local people can and has, had a significant positive impact on a wide variety of conservation issues.

The Association meets bi-annually with meetings rotating among member communities. We encourage you to become an active member of SAM by identifying a representative of your town to attend at least one of these meetings per year. This will serve as a significant connection for your town to provincially like-minded municipalities and link you to resources and training related to ongoing provincial conservation initiatives. You may also wish to express your interest in hosting one of these meetings.

“Wise Use” of the Stewardship Zone

Management of the Stewardship Zone

Council will seek to manage activities, within the limits of its jurisdiction, in the Stewardship Zone to minimize impacts on that coastal region and the sea ducks, seabirds and shorebirds that live there. Development proposals which, in the view of council, may negatively impact coastal habitat and/or sea ducks, seabirds and shorebirds in the area can, at the discretion of council, be forwarded to staff of the EHJV for comment with a thirty (30) day notice period.

There are several aspects to what constitutes “wise use”. Some significant components are laid out below.

Riparian Buffers

Riparian buffers are generally strips of untouched vegetation occurring between upland areas and wetlands, lakes, rivers, ponds, and streams. They are composed of trees, shrubs, grasses, cattails and sedges and often possess a high level of wildlife use, generally as “corridors” for travel, protection from predators and against inclement weather. These areas filter and reduce surface water runoff from upland areas, trapping sediment and filtering out excess nutrients, pesticides and bacteria. Vegetation in these areas also affects how readily water enters the soil and has a positive effect over the replenishing of local groundwater. They also serve to anchor soil with its roots, helping to build stream banks and prevent erosion. They are often important in controlling flood levels and are critical to a large variety of plants and animals. Fish habitat quality is also influenced by the amount of riparian edge left along shorelines. Treed buffers provide shade and serve to keep water temperatures down, also impact water quality; they provide spawning and rearing areas for fish species, and nesting areas for waterfowl. They serve as a large food source for a variety of wildlife when leaves and insects/insect larvae drop into the water body off surrounding trees and shrubs.

The province, via the provincial Lands Act –Section 7(1), generally requires a crown land reserve or easement of 15 meters along all water bodies greater than 1m in width and the maintenance of permanent riparian areas next to watercourses within the province. It is important that the Town ensures awareness and adherence to this crown land reserve designation by all of its residents. The vegetated (untouched) buffer exists as the <u>minimum</u> protection around all water bodies and marsh areas and is considered critical within the designated Management Units. Agriculture and cabin development seem like the two mostly likely disturbances to riparian vegetation.

Residential/Commercial Development

The Stewardship Zone currently incorporates a few pre-existing residential and cabin developments, however, no development has occurred within the Town's Management Units. Development along areas known to support waterfowl or shorebirds as well as the Banded Killifish should be treated with caution to reduce the impact on these species and to limit the amount of habitat loss associated with this development.

Fishing

Fishing within the Management Units of the Town of Channel – Port Aux Basques is not a significant concern with regards to waterfowl and wetland habitat. Some fishing occurs within the coastal area of the Stewardship Zone around Granby Point and Duck Island. No restrictions to the current fishing practices within the Stewardship Zone are necessary but fishermen should be reminded that waterfowl are easily disturbed during the nesting and brood raising period (May to mid-July). If fishermen do encounter waterfowl during this period, it is recommended they use discretion so as not to disturb the birds. Broods are very susceptible to predation when left unattended and during the nesting period adult waterfowl will often abandon the nest if disturbed. Also, when constructing docks or other structures, known nesting sites should be avoided.

The area is generally healthy and known to consist of a diversity of wildlife. However, within a section of the Big Barachois Pond, there is an area that is listed by the Department of Fisheries and Oceans as a 'Contaminated Area'. Testing was conducted by Environment Canada and the section of the pond was closed by the Department of Fisheries and Oceans. Molluscan Shellfish (which include mussels, scallops, clams, and oysters) was listed as unsafe for food for people and appropriate signage was posted within the area (Figure 4). The contamination has no significant harmful effect on waterfowl or shorebirds found in the area.

Figure 4 - Contaminated Site near Big Barachois Pond.

Tourism and Recreation

Channel – Port Aux Basques, being a "gateway" to and from the island of Newfoundland, is an excellent and thriving location of recreation and tourism opportunities. Much of the stewardship zone is used for walking and boating activities. This recreational use provides a great opportunity to raise awareness and educate visitors and residents about waterfowl and shorebirds within the community and the importance of wetlands, as well as the valuable sand dunes in the area.

Hunting

The hunting of waterfowl and other wildlife species often occur within Town's Management Units and Stewardship Zone as per existing Wildlife Regulations. These regulations dictate that it is illegal to discharge a firearm within 300 meters of a dwelling or within 1000 meters of a school, playground or athletic field.

The Wildlife Division knows that hunters play an important role in conserving migratory birds, and wildlife populations as a whole, when they respect wildlife habitat and support legal harvest limits. By setting an example of ethical hunting practices, each hunter helps to ensure a future for hunting wildlife, particularly waterfowl. Complying with non-toxic shot regulations will also help conserve the health of bird populations and their habitat.

Species at Risk- Piping Plover

The Piping Plover (*Charadrius melodus*) is a small, sparrow-sized shorebird designated as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and listed on Schedule 1 of the Federal *Species at Risk Act* (SARA) which is the legal list of species that the law protects. It is also designated as an Endangered Species under the Province's *Endangered Species Act*.

Figure 5: Adult Piping Plover

Reproductive success is limited in Newfoundland primarily because of disturbance and nest predation. Currently, there are approximately 30 pairs of adult Piping Plovers nesting in Newfoundland with the vast majority being on the southwest coast of the island. As these birds are one of only a few shorebird species which nest on sandy beaches they are subject to disturbance from predation, loose dogs, extreme weather conditions, possible destruction/nest loss by vehicles such as ATV's/dirt bikes, dogs, and in some cases deliberate destruction by humans. These disturbances can cause nests to be abandoned.

The Stewardship Zone contains several significant sites provincially for these endangered birds. Piping Plover have historically used the sandy beaches and dunes of the area from Grand Bay West to J.T. Cheeseman Provincial Park as a nesting/brood rearing/feeding area. It is known that Plovers have been returning to these beaches since at least 2001 to nest and likely much longer.

Both Federal and Provincial endangered species legislation requires that critical habitat be identified. Critical habitat is defined in the *Species at Risk Act* as "the habitat that is necessary for survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species". In Port aux Basques, Osmond Beach, Short Sand Beach, Big Barachois Beach, Bottle's Barachois, and Second Beach have all been declared critical habitat for breeding plovers.

In the interest of adopting a common approach to conservation, a code of conduct for Piping Plover beach users has been established. The list below indicates the things individuals should and should not do when they are visiting a beach where Piping Plovers are found.

1. Use motorized vehicle (ATV/s/dirt bikes) only in approved areas. Obey signs restricting use of motorized vehicles on beaches during the breeding season (May 1 to August 31).

The old railway bed in Channel - Port aux Basques which runs through the Stewardship Zone as well as two of the Management Units, forms a part of what is known as the Provincial TRailway Park, an approved All-Terrain Vehicle trail managed by the Department of Environment and Conservation, Parks and Natural Areas Division. This trail provides people with scenic views of wetlands, sand dunes, and the waters of the Gulf of St. Lawrence and the Cabot Strait and is an excellent recreational and tourism asset to the area.

However, a significant number of All-Terrain vehicle users leave the approved trail travelling across various portions of the Stewardship Zone. This use has increased in recent years with the increasing number of people owning such vehicles. A significant amount of habitat damage has been done over the years to the bog and incredible dune system found behind the beaches of the Stewardship Zone creating numerous semi-permanent trails and overland routes.

Dune systems, along with beaches, are important feeding, breeding, and nesting grounds for Piping Plover. In Port aux Basques these dunes are also a popular place for human recreation and this popularity means that many sand dunes are at risk of sustaining irreparable damage. Grasses create wildlife habitat and help hold the dunes in place. Although damage to sand dunes may not seem noticeable after a few uses, over time the vegetation and rooting of grass help to hold sand dunes together is destroyed. The loss of dune vegetation due to vehicular traffic and fires is a major

trigger for dune erosion. Dune vegetation normally traps windblown sand and holds it on the foredunes. However, when vegetation is lost, the exposed, dry sand is easily mobilised by high winds and large volumes of sand can be rapidly transported, sometimes forming large depressions in the dunes resulting in loss of important Piping Plover habitat.

On the ocean-side beaches themselves, per the Motorized Snow Vehicles and All-Terrain Vehicles Act and Regulations (1996), use of All-Terrain vehicles is legal on beaches except where prohibited by the responsible Minister. One of the central disturbance factors confronting breeding Piping Plovers in the area is the use of all-terrain vehicles/dirt bikes. There has been documented destruction and/or abandonment of nests and eggs and there have been a couple of cases where the ATVs have possibly caused the direct death of chicks and adult birds by crushing. Piping Plover are very hard to see in their natural habitat, and the nests are even harder to see. An ATV or dirt bike rider could crush a nest and/or chick and not even be aware of it. Even if the nests and birds are spared, motorized vehicles on Plover beaches can alarm the birds and prevent them from returning to their nests, consequently putting the nests in danger. Riders need to be made aware of the existence of Piping plover in Port aux Basques and understand that the loss of one bird or one nest can have implications for the entire provincial population of birds.

In response to this problem in recent years the province has closed four beaches within the Stewardship Zone (Short Sands, Big Barachois, Bottles Barachois and Second Beach), and one beach north of the Stewardship Zone (Osmonds Beach) to motorized vehicle use during the Piping plover breeding season (May 1-August 31). Signs have been placed each year, around the first of May, on central access points to the beaches prohibiting the use of motorized vehicles in these areas during the Plover breeding season.

DNR Conservation Officers conduct patrols of the beaches and can and have issued summary conviction tickets to vehicle operators inside the signed areas as per Sections 5 and 14 of the Motorized Snow Vehicles and All-Terrain Vehicles Regulations. If individuals are observed directly impacting Plovers and/or their residence (nest site) they could also be charged under the federal or provincial Endangered Species Act(s) which would have even more significant consequences up to and including jail time. At the end of the breeding season, around August 31st, the signs will be removed.

2. Observe and photograph Piping Plovers from a distance, walk at the water's edge, and conduct activities away from nesting or feeding areas.

Piping Plovers are easily disturbed. Even someone hanging around the beaches trying to get a picture for a prolonged period of time can prevent a Plover from feeding and resting, putting the nest in danger. When a Plover nest is approached, the incubating adult will be forced to leave the nest, causing a break in incubation. When this occurs, the eggs can become overheated or chilled which could kill the embryo. Disturbed adults may even abandon the eggs completely.

Port aux Basques beaches are a popular place for recreation, especially during the summer. Studies show that fewer young are raised on beaches that are popular for recreation than on less-disturbed beaches. Therefore, to be sure no Plovers are minimally affected by beach users, beach users should seek to conduct their activities as far as possible from nesting or feeding areas. The safest place to walk when in the vicinity of breeding plovers is on the firm wet sand near the waters edge. Signs are often placed by biologists and plover guardians indicating the general location of nests to alert beach users.

3. Don't litter

The illegal dumping of garbage does not seem to be a common activity within the Stewardship Zone and Management Units; however, dumping has been seen in a couple of areas in the past including Piping plover beaches. Litter attracts predators to the area resulting in loss of plover chicks and eggs. Predation has been identified as one of the most important factors limiting populations of Piping Plovers across the North American breeding range. Trash, food scraps, and dead fish attract predators. These predators may hunt or opportunistically take adult Piping Plovers, chicks, or eggs. Therefore, it is important for beach users to not litter and to remove any trash they may see lying on the beach.

4. Do not remove natural debris such as driftwood.

Not only can the Piping Plovers be disturbed when individuals walk along the beach to actually remove such natural debris but beach cleaning removes important components of Plover habitat. Things such as wrack (seaweed) and other natural debris (driftwood, pebbles) provide valuable feeding areas and shelter from inclement weather for the Plover as well as camouflage of individuals, nests and eggs.

5. Keep pets leashed.

Domestic pets, specifically cats and dogs, pose a serious threat to Piping plover eggs, chicks, and adults. While domestic cats are not suspected to be a great threat on Port aux Basques beaches, cats are natural born hunters and even well-fed cats chase and kill birds. Domestic dogs are more likely to pose a threat and unleashed dogs have been known to chase adult Plovers, destroy their nests, as well as kill chicks.

All pets, dogs in particular, should be kept on a leash (less than 6 feet in length) and walked at the water's edge to prevent them from disturbing Piping Plovers or their habitat when passing through. Furthermore, under Wildlife Regulation 40(3), it is illegal to allow your dog to chase or harass wildlife.

6. Do not pick up Piping Plover chicks or eggs.

Although this is an uncommon occurrence, there have been several confirmed instances of children removing chicks/eggs from nesting beaches. Young children should be supervised at all times while on Piping Plover beaches and it is important to make them aware of the importance of avoiding Piping Plover nests.

7. Promote public education and awareness

Since 2001 there has been an active Piping Plover Beach Guardian program supported by federal and provincial dollars. Guardians, some of whom are volunteers, seek to maintain a presence on beaches during the breeding season to ensure disturbance to the Plovers is minimized. These guardians work mainly in an educational capacity and aim to reduce levels of human disturbance around nest sites or broods. Guardians will intercept beach users who appear to be intruding upon Piping Plover territory. The guardians will encourage beach users to give the Plover territory a wide berth by walking on the wet sand and staying close to the water and keeping pets on their leashes.

Section 5: Wetland Conservation and Education Strategies

Waterfowl Monitoring Project

Staff of the Wildlife Division have compiled an easy to use community-based waterfowl monitoring protocol and are willing to assist community partners in its implementation (Appendix 5). It is hoped that Town's local community interest groups and interested volunteers (often bird-watchers) will establish a waterfowl monitoring program within all areas of the Town, but particularly within the designated Management Units. The program could even be incorporated into portions of the regular school class curriculum or into the objectives of local natural heritage organizations. Data collection can provide information on changes that are occurring within the wetland area and can indicate problems or progress towards a desired goal of waterfowl populations. Monitoring can also provide data on whether a site is developing in a way that is conducive to achieving a community's goal. Regular monitoring can also be a way to flag potential problem areas (i.e. early indicators of water quality issues). Additionally by involving local residents, the profile of the area is enhanced to the long-term benefit of conservation.

Conservation Corps Green Teams

The Newfoundland and Labrador Conservation Corps annually sponsors summer "Green Teams" and "Interns" generally comprised of university and high school students, to work within communities on worthwhile environmental projects. In the past, such teams have been placed in communities with Stewardship Agreements. Examples of potential projects could include constructing and installing waterfowl nest boxes and nesting platforms [for Canada Geese (*Branta canadensis*)] followed by subsequent monitoring throughout waterfowl breeding/brood-rearing seasons. Green Team members could be tasked with training local high school students or community members in appropriate monitoring protocol and could develop brochures and educational material designed to raise awareness for conservation and stewardship initiatives. This project could be extended to bird houses and would serve to provide data on birds using various habitats within the entire community.

Artificial Nesting and Loafing Structures

Ospreys

Ospreys (*Pandion haliaetus*) are fish-eating raptors that are frequently observed hunting in wetland habitats, particularly areas along the coast. Unfortunately, populations of these birds plummeted in North America during the 1950's and 1960's due to the wide spread use of pesticides and other pollutants which have a tendency to bioaccumulate in birds of prey, like the osprey. For many osprey populations, bioaccumulation results in frequent reproductive failures. With the

banning of many pesticides in the early 1970's, many osprey populations have made a comeback.

Osprey prefer to nest on tall, often dead, trees on the shoreline of lakes and bays that are at least 2 meters deep but make nests in a multitude of locations (e.g., telephone poles, communication towers, etc.) as long as the area is wide open with an adequate food supply. Preferred natural sites are scarce due to timber harvesting and shoreline developments.

In many parts of Canada, the installation of artificial nest structures (Figure 6) by concerned citizens and community groups have facilitated the comeback of the osprey. Osprey nest structures have been installed at several sites in Newfoundland, including many municipal stewardship communities. Many people take great pleasure in watching these majestic birds raise their family and fish the shallow waters of nearby lakes and bays.

It may be advisable to install a single osprey platform at a carefully chosen location to determine whether the ecosystem can sustain a single, monogamous, breeding pair of osprey, with subsequent platforms planned accordingly. In conjunction with an observation tower, area residents could potentially enjoy a "bird's eye view" of osprey daily life high atop an artificial nesting structure. Artificial nesting platforms should be located in areas with minimal human use and where human impact would be least. Involvement of schools, youth groups and community organizations in the construction/maintenance/observation of the nesting structure could instill a sense of pride and awareness that would go far in fostering a community stewardship ethic.

See Appendix 6 for the design and placement of Osprey nesting platforms.

Figure 6 – Osprey nesting platform.

Island Construction

A number of wildlife species, such as terns and waterfowl, nest and loaf on islands due to a reduced risk of predation from land-based predators. Many of the wildlife species present within wetlands would benefit from the construction of artificial islands (see Appendix 7). These structures can be constructed simply from wooden cribs (Tamarack Larch would be an appropriate choice for building material), measuring approximately four square meters that have been filled with rock and soil. The islands must be positioned so that they are higher than the highest water mark. Hardy shrubs and herbaceous plants (i.e. alder, willow) must be planted on the islands to provide cover and to prevent occupancy from gulls. Care must be taken to prevent the use of toxic construction materials (i.e. treated wood, contaminated soils) and disturbance to plant and animal communities. One must also consider the potential for increased predation on certain avian species that may use the constructed islands. One must consider the potential necessity for annual removal and reinstallation of islands in response to ice conditions tidal influenced areas.

Other forms of artificial islands exist and involve the planting of native marine plant species into landscaping fabric, which is then fixed to floating structures made of plastic piping or empty gabion baskets. This type of floating island requires careful placement in areas that do not have widely fluctuating salinity levels and require placement such that disturbance would be minimal during the period in which roots are establishing. Floating islands may be beneficial in terms of oxygenating the water column, as algal blooms would not "smother" the highly perched plants. The floating plants should, ideally, continue photosynthesizing despite the presence of algae, and may be of benefit in "taking up" some of the excess nutrients in the estuary effectively deterring algae growth. These floating islands would also, likely, require annual removal and reinstallation.

Cavity Nesting Waterfowl

Cavity nesters such as the Common Goldeneye have certain habitat requirements for nesting. When available they use abandoned woodpecker holes or natural tree cavities caused by disease, fire or lightning. In the absence of these natural cavities, they will use constructed nest boxes (Figure 7). These shelters, however, need to be installed correctly and placed in a location that is inhabited with waterfowl.

When installing nest boxes, there are important guidelines that are to be followed (see Appendix 8). These guidelines will help increase the success of nest box usage. When nest boxes are to be installed, the Wildlife Division staff often includes

Figure 7 – Cavity Nest Box

a map where the nest boxes should be placed to encourage use by the target duck species. It will also help ensure that the placement of nest boxes will enhance wetlands that are included in the Stewardship Agreement signed by the community.

As a general rule, we ask that the location of the nest boxes be marked using a global positioning system (GPS). If the community requires assistance they can contact the Wildlife Division or a local conservation officer. It is very important that we receive coordinates for nest boxes for reporting and maintenance purposes.

Nest boxes can be mounted on tree trunks (preferably dead but solid trees) that extend slightly over the water's surface. Nest boxes may be placed on metal poles close to the edge of a pond, but we advise extreme caution in this situation so that snowmobilers do not run into your poles during winter months. If there is even a slim chance that someone could run into the metal pole, we suggest that you find another way to install your nest box.

Good placement would involve a dead tree standing along a shore. Better placement would be on a solid tree standing in water. Suitable placement would also be on a metal pole in a safe area (with no danger of being hit by motorized vehicles), on a shoreline next to a dead or flooded tree, firmly planted into the pond or marsh bottom. Boxes can be placed on live spruce or larch, but may loosen as the tree continues to grow. If using a live tree, remember to clear away limbs from just on top of the box so that squirrels and marten don't end up jeopardizing the lives of your ducklings. Keep in mind that beaver may chew live hardwoods like birch, so placement on these trees should be avoided, as you will soon be wondering where your nest box went!

Boxes should be placed above typical high water levels at a height that still allows you to clean (annually) and monitor the boxes. Ideally, boxes will be placed as high as possible, but at least 4 to 6 feet above the water's surface. Boxes should be placed on trees that bend slightly over the water's surface. When ducklings are ready, the adult will force them out of the entrance of the nest box and it is important that the box be positioned appropriately or the duckling may not fledge successfully and an ill-placed box has been known to actually jeopardize lives of ducklings.

Try to keep your nest box close to water and clear a path (of any small branches, etc.) so that ducks have a direct line of access from the water. The entrance hole should face the water. Do not place boxes so close together that competition will occur. As a rule, boxes should be placed no closer than 50 meters apart (one nest box per acre is considered acceptable) and shouldn't be placed where ducks can see each other from neighboring boxes.

Boxes must be maintained every year (with winter months being the preferred time for maintenance) by scraping out old planar shavings and replacing with new, clean, planar shavings. It is very important not to use sawdust as the pieces are too small and can actually suffocate ducklings. A garden store or sawmill would be an easy

source for planar shavings or mulched wood. Eight to ten centimeters of clean wood shavings should be placed in the bottom of the box before breeding season. Hens will actually reject nest boxes that do not have shavings, and eggs could freeze if there are not enough shavings in the bottom of the box.

Common Goldeneye will raise multiple broods in a well-maintained and suitably placed nest box. If you are lucky, you will actually get to see ducklings leaving the box (although you should avoid approaching the nest box to check on its use during important times like hatching and fledging), but mostly you will find signs left in the box when you prepare for its annual maintenance. You should look for light coloured duck down, bits of egg shell or shell-membrane (like a piece of paper) left behind when duckling hatch and mixed up wood shavings. Ducklings in the area indicate there are ducks and it is quite possible that they have used the nest boxes provided. It is also a great idea to keep in mind that other birds and small mammals may have used the nest boxes as well.

Installing nest boxes is a very exciting activity to help enhance waterfowl in the conservation areas around your community. It does, however, take time, commitment and maintenance and if any technical advice or help is needed it is advised to contact the staff of the Wildlife Division. See Appendix 8 for the design and maintenance of cavity nest boxes.

Roosting and nesting structures for non-waterfowl species

There are also a variety of roosting and nest structures which can be built, installed and monitored/maintained for non-waterfowl species such as those that might be appropriate for birds like Tree Swallows (*Tachycineta bicolor*), Northern Flicker (*Colaptes auratus*), for owls like the Great Horned (*Bubo virginianus*) and for bats (Figure 8). This would prove beneficial to local farmers in that many bird species (and bats) feed on insects and may serve as natural pest control. In addition, providing nests for certain birds may also help reduce (or keep in check) populations of birds that may not be desirable to farmers [i.e. American Crow (*Corvus brachyrhynchos*), European Starling (*Sturnus vulgaris*)] and rodents (i.e. mice) while increasing biodiversity on the agricultural landscape.

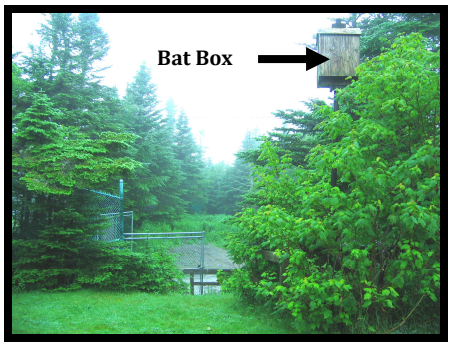


Figure 8 – Bat Roosting Box.

Educational Programs

Public education is essential in the development of a greater sense of habitat stewardship among town residents. There are several well developed wetland education programs that span every season and every age group including "Wetlands in Winter" (Tantramar Wetlands Centre), "Marsh Bingo" and "Creatures of the Night" (Oak Hammock Marsh Interpretive Centre), "Junior Naturalists" (Wye Marsh Wildlife Centre), "Project Webfoot" (Ducks Unlimited Canada). A number of night programs also exist that would be appropriate for girl-guide and scout troupes. Certain programs may qualify for external funding through various private enrichment grants (e.g., Mountain Equipment Co-op or the Canadian Wildlife Federation).

Project Wild

Project Wild is an educational program conducted by the Newfoundland and Labrador Wildlife Division and is aimed at youth from kindergarten to grade six. Its goal is to develop awareness, knowledge, skills and commitment resulting in informed decisions, responsible behavior and constructive actions concerning wildlife and the environment upon which all life depends. Project Wild is not just "wildlife" education. It is a broad environmental education program focusing on wildlife. Wildlife is used as a tool that naturally captures student interest and as a symbol for the fragility of the environment providing a means to also educate youth about the value of wetlands for waterfowl.

Backyard Habitat for Canada's Wildlife

This habitat awareness initiative is made available by the Canadian Wildlife Federation and is administered in conjunction with the Wildlife Division's Salmonier Nature Park. This program enables the average townsperson to become an active participant in helping wildlife and in enhancing habitat for wildlife use. Backyard Habitat for Canada's Wildlife is a program that offers immediate, specific and inexpensive suggestions on how to make life better for wildlife in a particular habitat.

Nature and Art

Some stewardship communities have used the wetlands and associated wildlife as opportunities to also serve as a natural location to bring together nature and art. This is made much simpler if a central building or interpretation area is present on site. Local art classes and drama groups use the freedom afforded by an outdoor theatre for educational exercises. This could involve field trips whereby students could interpret the beauty of wetlands - and nature in general - through various mediums (chalk, paint, etc.) or a day of sketching to the sound of nature or music. Being innovative in efforts to assemble art supplies might include visiting websites like Crayola.com which offer special resource grants to educators.

Similarly, drama classes could develop a play or a series of dramatic readings based upon wetlands or nature with evening delivery within a lighted amphitheatre. Several amphitheatres in Eastern Canada utilize the open-air concept to show nature-related videos or videos with an environmental message outdoors in the evening. Videos could be tailored to various ages and could include nature-related craft projects within the Eco-museum shelter as a follow up. A good starting point for videos and educational nature-oriented craft projects for children may include websites like hookedonnature.org and planetpals.com.

Ducks Unlimited Canada's Youth Programs
Project Webfoot
Educating youth about wetlands and waterfowl is a big part of Ducks Unlimited Canada's mission. The award-winning Project Webfoot Wetland Education Program is a comprehensive program linked to the senior elementary curriculum in grades 4 to 6 (habitats & communities, biodiversity, food webs and adaptations). Learning resources and field trips to a local wetland are available to sponsored classes. There are also many teacher and student resources for Grade 4 through high school on the Ducks Unlimited website (www.ducks.ca). These downloadable files are easy to navigate and provide great linkages with school curriculum.

Wetland Heroes
Another program offered through Ducks Unlimited includes Wetland Heroes which take action to protect wetlands for wildlife and people in their local community. Whether you're one person, a group of friends, a class, club or school there are many ways you can make a difference from letter writing to fundraising and habitat enhancement projects and more. To become an official Wetland Hero register at www.ducks.ca and describe the great conservation work you're doing to help protect wetlands. Wetland Heroes receive a certificate and a special token of appreciation from Ducks Unlimited Canada. With permission, selected Wetland Heroes may be featured online or in publications.

Habitat Enhancement
In some wetland areas, the surrounding habitat has already been degraded or lost and could benefit from the planting of wetland and waterfowl "friendly" plants. A number of aquatic plant species have the ability to remove large quantities of pollutants from water. These plants improve water condition by "uptaking" excessive amounts of nitrogen, phosphorous and carbon – substances associated with the occurrence of algal blooms – by storing them in plant tissues. Many "classic" beneficial plant species have limited distribution in Newfoundland, and should not be introduced to the sensitive ecosystem of the estuary without consideration of the potential consequences, including the possibility of invasive plants out-competing native plant species.

Often, the natural balance within an ecosystem can be changed when new species are introduced. The relationships that develop between plants and animals may also

change within a particular habitat. Introduced species are referred to as "exotic" species if they are not native to an area. Competition naturally exists between organisms within an ecosystem but the introduction of exotic, or nonnative, species can alter the balance within the ecosystem and have negative effects upon the natural populations within the region and the ecosystem as a whole.

Eelgrass is an aquatic grass is known to have significant value for waterfowl and providing habitat for many aquatic species such as juvenile Salmonids. It is possible to encourage the growth of Eelgrass beds through an inexpensive project of habitat management and shoot transplantation from a nearby donor site. A thorough site evaluation would have to be initiated in consultation with staff of the Wildlife Division to assess the topography of the coastal area, water salinity and substrate suitability before proceeding with the project. However, encouraging eelgrass bed establishment is a project that has been successfully completed in a number of areas across Canada.

Certain species of Willow (*Salix discolor*) and Alder (*Alnus crispa*) are native to the island of Newfoundland, are found in areas of the Avalon Peninsula, and are renowned for their hardiness, their ability to withstand tidal inundation and their extensive network of roots (see Appendix 6 for a list of vegetative species that are ideal for bank stabilization). Their ability to uptake excess nutrients from the water column would make these native species an important addition to coastal shorelines. In addition to bank stabilizing properties and nutrient uptake characteristics, willow and alder buds and shoots are an important food source for small mammals like Muskrat (*Ondatra zibethicus*) and Snowshoe Hare (*Lepus americanus*), and bird species like Ruffed Grouse (*Bonasa umbellus*) and Grosbeaks (*Coccothraustes vespertinus*).

In terms of wetland plants that would be of dietary importance to waterfowl populations, Three-Square Bulrush (*Scirpus americanus*), Salt Water Cord Grass (*Spartina alterniflora*), Wild Rye (*Elymus virginicus*) and Blue-joint Grass (*Calamagrostis canadensis*) are all native to the island portion of Newfoundland and would all supply food to a number of estuary inhabitants. Tall stands of established Cord Grass and Wild Rye also offer a great deal of shade and cover to waterfowl and may lower water temperature to prevent algal blooms from occurring.

In terms of bank or shoreline stabilizing properties Blue-joint Grass and Dune Grass (*Ammophilia breviligulata*) may be appropriate choices. Once established these grasses would provide a great deal of cover and concealment to waterfowl species. Low growing native shrubs may be interspersed with either grass species to enhance the desired effect of seclusion.

Litter Removal
It is recommended that community interest groups and individual residents work cooperatively to remove the large quantity of litter in and around all portions of the community on a regular basis, while making certain to avoid those times of year (May to August) when waterfowl may be disturbed during breeding, staging or brood rearing periods. Programs such as Ocean Net and Vanaqua Shoreline Cleanup assist communities in organizing litter cleanups.

Water Control Structures
A community may wish to enhance a wetland area by changing the water flow or controlling the water depth (Figure 9) to attract waterfowl. Ducks Unlimited Canada (DUC), a partner of the Easter Habitat Joint Venture, has a great deal of experience in this area. Staff of the Wildlife Division can put you in touch with DUC to assess the possibilities, costs and issues in this area.

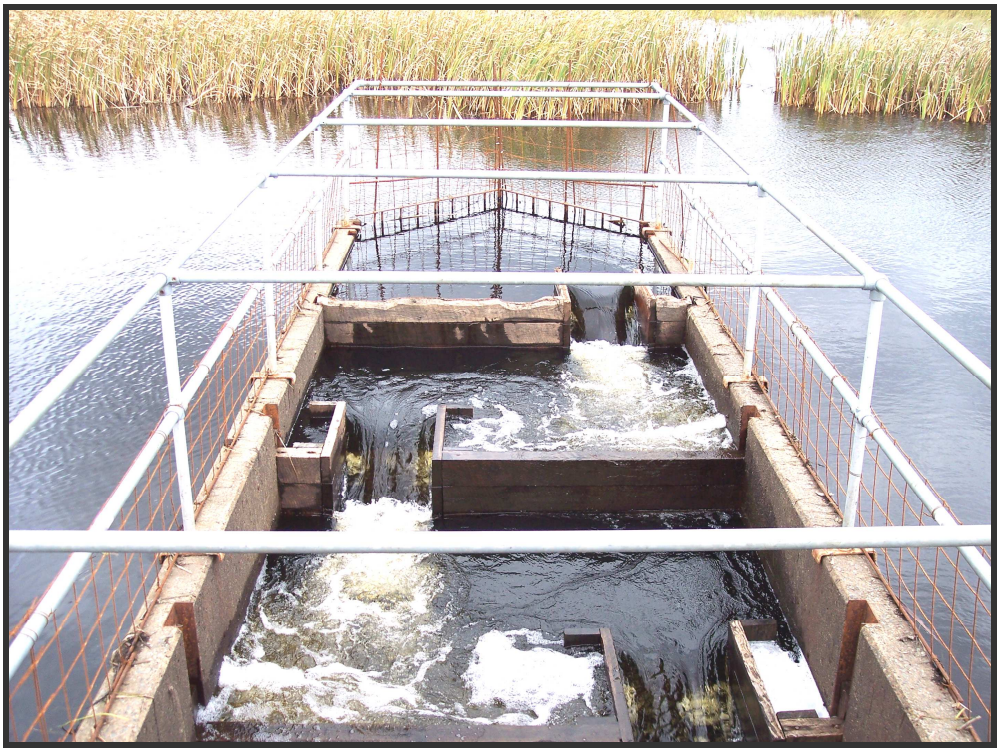


Figure 9 – Fish Baffles

APPENDICES

Appendix 1

PORT AUX BASQUES
MUNICIPAL STEWARDSHIP AGREEMENT

THIS AGREEMENT made at Port Aux Basques, in the province of Newfoundland and Labrador, this 20th day of August, 2003

BETWEEN: THE TOWN COUNCIL OF THE TOWN OF PORT AUX BASQUES
the municipal corporation organized
and existing under the laws of Newfoundland and Labrador

(hereinafter called the "Town")

of the one part

AND: HER MAJESTY THE QUEEN IN RIGHT OF NEWFOUNDLAND, as represented
by the Honourable the Minister
of Tourism, Culture and Recreation

(hereinafter called the "Minister")

of the other part

WHEREAS the Government of Newfoundland and Labrador has entered into an Agreement with others for the implementation, management and enhancement of the North American Waterfowl Management Plan through the Eastern Habitat Joint Venture;

AND WHEREAS the parties hereto recognize that the proper protection and management of both wetlands and uplands habitats are fundamental tools in maintaining and enhancing waterfowl populations in the province;

AND WHEREAS the Minister proposes that certain important wetlands and associated wildlife habitat within the Town be protected and enhanced through and with the cooperation of the Town in accordance with this Agreement and the Habitat Management Plans developed hereafter;

AND WHEREAS the Town has agreed to enter into the Agreement for the purpose of protecting and enhancing those areas of important wetland habitat within its jurisdiction.

NOW THEREFORE IT IS AGREED BY THE PARTIES AS FOLLOWS:

1. The lands herein delineated and designated as a Stewardship Zone (being the lands outlined on a certain Schedule annexed hereto and marked "A" shall be set aside, preserved and managed in accordance with terms and conditions of this agreement including any Habitat Management Plan developed hereunder for better protection of the wetlands for waterfowl and other wildlife.

2. Within the limits of its jurisdiction, the Town will take any and all steps possible to ensure that only those activities that have no negative impact on the wetlands are permitted within the Stewardship Zone.

3. Within the Stewardship Zone, the Parties establish Management Units identified in Schedule "A" and other Management Units as may be desirable from time to time which shall be subject to the terms and conditions of a Habitat Management Plan designated to enhance and protect wetland habitats, the waterfowl and other wildlife which use those habitats.

4. The Habitat Management Plan shall be developed in cooperation with the Minister and the Minister agrees to provide such advise and expertise necessary or advisable for the development of the Habitat Management Plan.

5. The Town agrees that in the preparation of a Municipal Plan for the Town or any amendments to any existing Municipal Plan, the areas designated as Management Units shall be recommended by the Town to be appropriately declared protected areas under Part VI of the Urban and Rural Planning Act (or such other legislation in amendment or substitution therefore as may be brought into effect from time to time). The Town in passing regulations or by-laws related to the protected areas so designated under the Municipal Plan or amendments thereto and which may effect the Stewardship Zone shall do so in consultation with the Minister and in keeping with the principals of this Agreement.

6. The parties to this agreement, their consultants, servants, or agents, shall have and exercise reasonable rights of access to the Stewardship Zone for all purposes necessary or incidental to this Agreement and in particular, but without limiting the generality of the foregoing, for the purpose of developing and carrying out the Habitat Management Plan.

7. Each of the parties hereto agrees that they will exercise their best efforts to further develop management measures for the more effectively carrying out of their mutual intentions as expressed in this agreement.

IN WITNESS WHEREOF the parties have caused these presents to be executed in accordance with their respective rules and regulations the day and year first before written.

SIGNED SEALED AND DELIVERED
by the Honourable the Minister
of Tourism, Recreation and Culture
in the presence of:

THE HONOURABLE THE MINISTER
OF TOURISM, CULTURE AND RECREATION

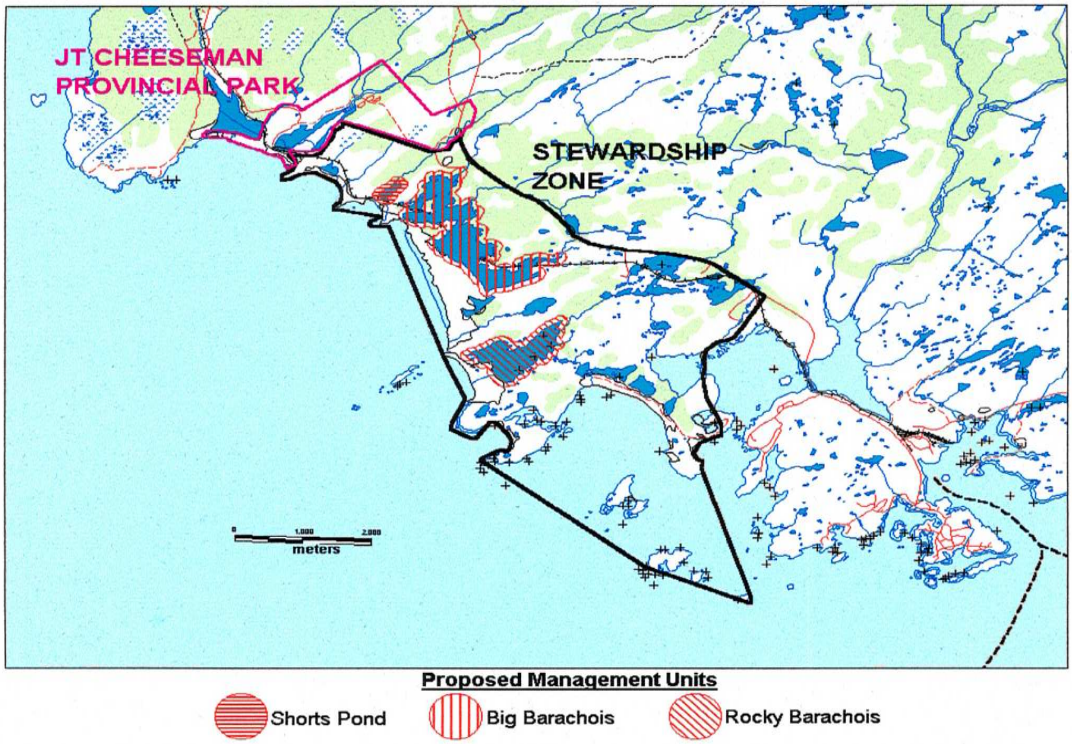
Witness
Minister of Justice.

THE SEAL OF the Town Council of
the Town of Port Aux Basques was
hereunto affixed in the
presence of:

THE TOWN COUNCIL OF THE
TOWN OF PORT AUX BASQUES

Witness
Minister of Justice.

Schedule A



Stewardship Zone

The northern edge of the Stewardship Zone borders J.T. Cheeseman Provincial Park, and then continues south along the Planning Boundary of Channel - Port Aux Basques. It then turns north at Yankee Rock to Granby Point following the shoreline until Grand Bay West Road. The Stewardship Zone then follows Grand Bay West Road to the Trans Canada Highway (TCH), and turns north-west following the TCH to J.T. Cheeseman Park.

Management Units

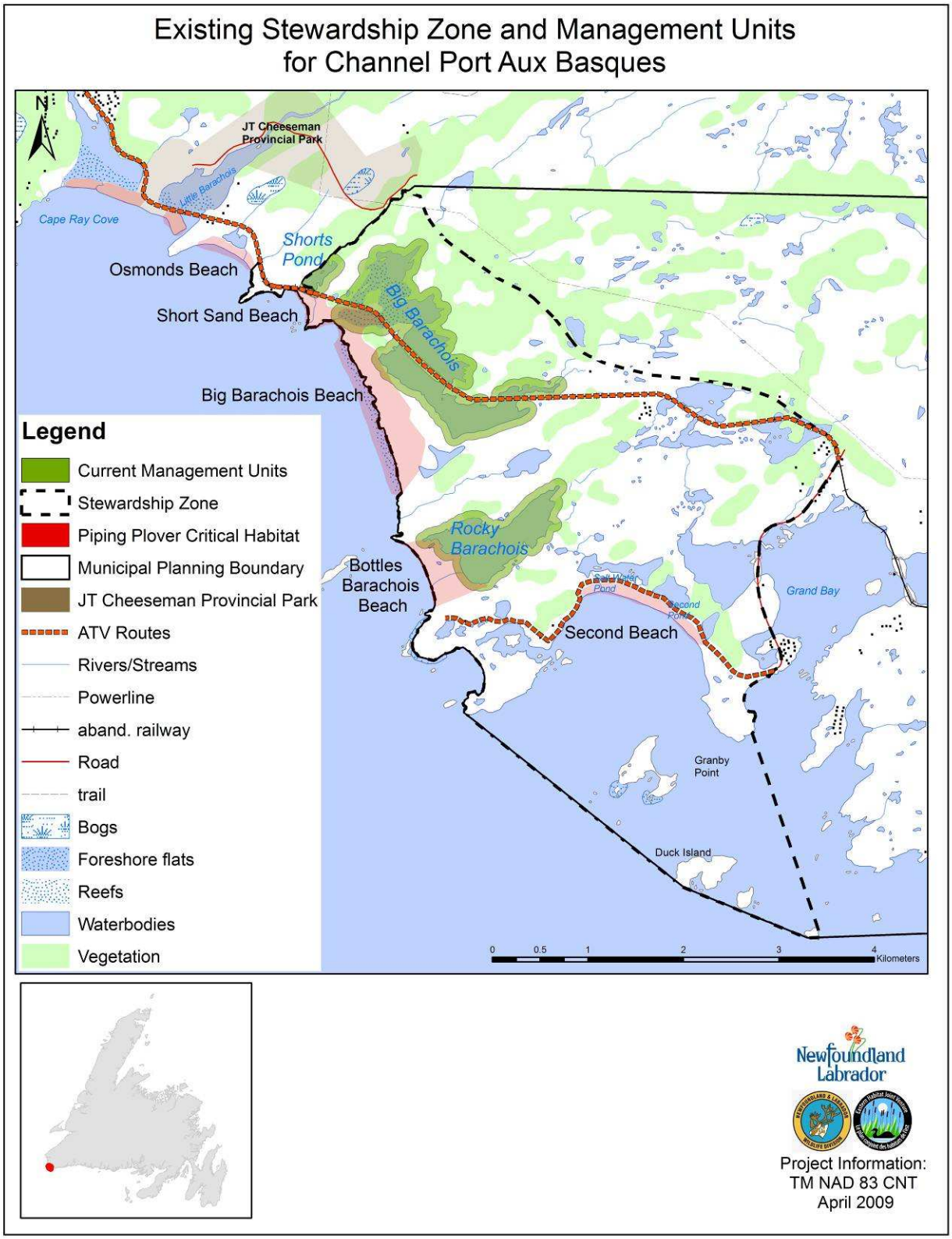
Short's Pond Management Unit is located 59.24 degrees longitude by 47.62 degrees latitude.

Big Barachois Management Unit is located 59.23 degrees longitude by 47.61 degrees latitude.

Rocky Barachois Management Unit (commonly known as Bottles Barachois) is located 59.22 degrees longitude by 47.59 degrees latitude.

The water bodies and their surrounding wetlands have a buffer of 75 meters starting from the shoreline and moving outward. This overall area constitutes the Management Units.

Appendix 2: Detailed Maps of Management Units



APPENDIX 3
Avian and other Wildlife Species Observed in the Stewardship Zone

Group	Common Name	Scientific Name
Loons	Common Loon	Gavia immer
Geese and Ducks	Northern Pintail	Anas acuta
	American Wigeon	Anas americana
	Green-Winged Teal	Anas crecca
	Mallards	Anas platyrhynchos
	American Black Duck	Anas rubripes
	Lesser Scaup	Aythya affinis
	Ring-necked Duck	Aythya collaris
	Greater Scaup	Aythya marila
	Canada Goose	Branta canadensis
	Common Goldeneye	Bucephala clangula
	White-winged Scoter	Melanitta fusca
	Common Merganser	Mergus merganser
	Red-breasted Merganser	Mergus serrator
	Common Eider	Somateria mollissima
Pelicans, Petrels, and Shearwaters	Double-crested Cormorant	Phalacrocorax auritus
Herons	Great Blue Heron	Ardea herodias
Shorebirds	Least Sandpiper	Calidris minutilla
	Piping Plover	Charadrius melodus
	Common Snipe	Gallinago gallinago
	Black-bellied Plover	Pluvialis squatarola
	Spotted Sandpipers	Tringa
	Lesser Yellow Legs	Tringa flavipes
	Greater Yellow Legs	Tringa melanoleuca
Gulls and Terns	Herring Gull	Larus argentatus
	Black-headed Gull	Larus ridibundus
	Caspian Tern	Sterna caspia
	Common Tern	Sterna hirundo
Diurnals Raptors, and Falcons	Sharp-shinned Hawk	Accipiter striatus
	Northern Harrier	Circus cyaneus
	Bald Eagle	Haliaeetus leucocephalus
	Osprey	Pandion haliaetus

Group	Common Name	Scientific Name
Jays, Crows and Ravens	American Crow Common Raven	Corvus brachyrhynchos Corvus corax
Kingfishers and Allies	Belted Kingfisher	Ceryle alcyon
Sparrows	Dark-eyed Junco Savannah Sparrow Snow Bunting	Junca hyemalis Passerculus sandwichensis Plectrophenax nivalis
Finches, Euphonias, and Allies	Common Redpoll	Carduelis flammea
Grouse, Quail, and Allies	Willow Ptarmigan	Lagopus lagopus

Wildlife Species observed in Stewardship Zone

Group	Common Name	Scientific Name
Fish	Banded Killifish	Fundulus diaphanus
Furbearers	Snowshoe Hare Mink Masked Shrews Red Squirrel	Lepus americanus Neovison vison Sorex cinereus Tamiasciurus hudsonicus
Big Game	Moose	Alces alces

APPENDIX 4
Common Plants of the Stewardship Zone

Group	Common Name	Scientific Name
Trees	Balsam Fir	Abies balsamea
	White Birch	Betula papyrifera
	Larch	Larix laricina
	White Spruce	Picea glauca
	Black Spruce	Picea marina
	Trembling Aspen	Populus tremuloides
Shrubs	Speckled Alder	Alnus incana ssp. rugosa
	Sheep Laurel	Kalmia angustifolia
	Labrador Tea	Ledum groenlandicum
	Twinflower	Linnaea borealis
	Sweet Gale	Myrica gale
	Shrubby Cinquefoil	Potentilla fruitcosa
	Rhodora	Rhododendron canadense
	Wild Red Raspberry	Rubus idaeus
	Blackberry	Rubus sp.
Herbs	Yarrow	Achillea millefolium
	Pearly Everlasting	Anaphalis margaritacea
	Bog Aster	Aster nemoralis
	Coltsfoot	Compositae sp.
	Bunchberry	Cornus canadensis
	Wild Lettuce	Lactuca sp.
	Canadian Burnet	Sanguisorba canadensis
	Pitcher Plant	Sarracenia pyrpurea
	Dandeloin	Taraxacum officinale
	Meadow Rue	Thalictrum polygamum
Sedges	Beach Grass	Ammophila breviligulata
	Beaked Sedge	Carex rostrata
	Wool-grass	Scirpus cypernius
Rushes	Spike Rush	Eleocharis sp.
	Bayonet Rush	Juncus militaris
Ferns and Allies	Swamp Horsetail	Equisetum fluviatile
	Sensitive Fern	Onoclea sensibilis

APPENDIX 5
Waterfowl Monitoring Project Protocols and Data Sheets

Generally within a community's wetland management units, a set number of locations for viewing waterfowl are chosen and outlined on a detailed map. These sites are chosen, for ease of access and ability to view waterfowl over a wide area, but they are also relatively evenly distributed around the wetland. Sites can be chosen to sample productive, historically productive and potentially non-productive waterfowl locations to give a representative snapshot of inhabitants of the estuary.

Each site location should be visited during a single day, within a two-three hour period, which will mean, in most towns, that more than one person will need to be involved. The survey should occur, at least once within a two week period in both the spring and fall. You are most welcome to complete and record as many observations as your schedules permit but the above indicates that, at a minimum, at least two surveys would occur annually.

These surveys should occur **during the last two weeks of June and during the first two weeks of October and should occur either in the early morning (starting at dawn and up to ~ 3 hours afterwards) or in the early evening (starting ~3 hours before dusk).**

If you are not already familiar with the area it would be advantageous for you to become familiar with the sample locations identified on the map prior to the day of your survey. It may also be prudent to seek private landowner permission in advance of your intended survey day. In addition, identify access points (ex. determine whether best approached by foot or by boat) well in advance so that your survey can be completed in a single morning or evening.

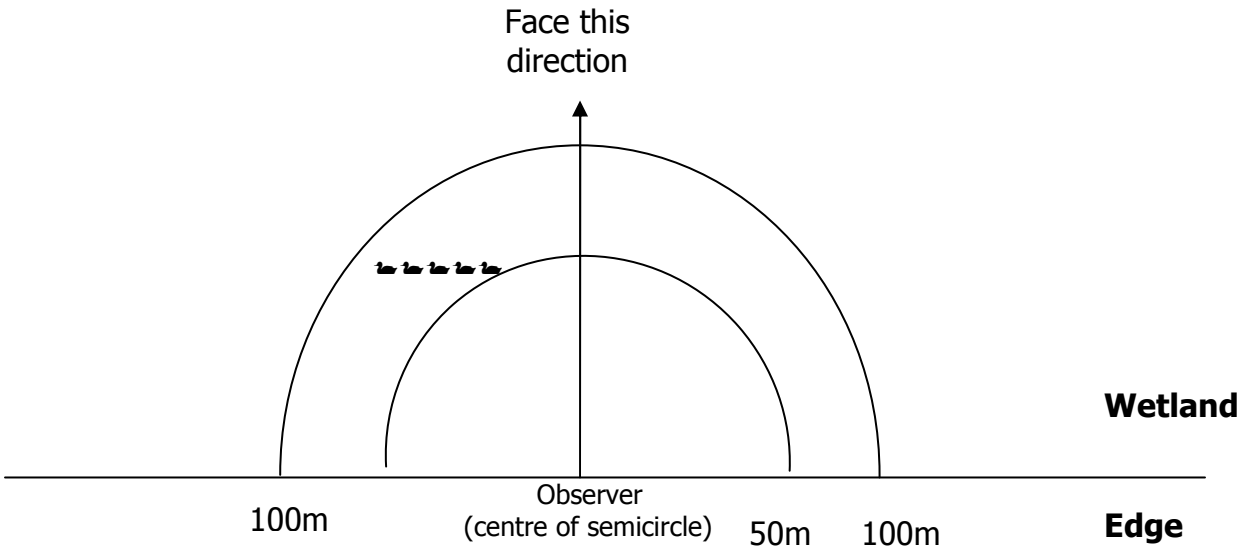
Survey Locations

The intended survey sites should be relatively easy to access (off roads or meadows) and are intended to follow the shoreline of the wetland. **Observations should be made within a semi-circle** oriented towards the wetland instead of attempting to watch in a full circle all around you which could form an unnecessarily difficult amount of survey area in a short period. Orient yourself so that you can maximize the amount of wetland being observed (i.e. your view should not encompass a large swath of open field or roadway) **out to a distance of ~100m on either side of you**. It may be prudent to become familiar with what a 100m distance roughly looks like before setting up your survey.

Some sites may be more easily accessed by non-motorized water craft such as canoe or kayak. If you choose to use canoe or kayak, the centre of the semicircle will become your boat and you will orient your semicircle accordingly. It will be especially important to

approach your survey site slowly and quietly by boat or kayak since your odds of flushing waterfowl will be increased.

Consider the following drawing as your sample area:



Tools you should consider having include the following:

- A keen eye!
- Field notebook or data sheet (attached)
- Pencil - record findings
- Watch - keep track of time (10 minutes per survey site)
- Bird field guide
- Pair of binoculars and/or a spotting scope (binoculars may be sufficient)
- Appropriate outdoor clothing
- Cellular phone in case of an emergency

Conducting the Survey

Surveys should only be conducted under suitable or good weather conditions. This includes good visibility out to 100m, reasonably warm air temperature, little or no precipitation and little or no wind. If poor conditions develop and last for an extended period, it is suggested that you reschedule your survey for another day. **Once you have reached the survey site and oriented yourself so that you have maximal view of the area, sit quietly and begin timing for 10 minutes.** It is advised that you record any waterfowl that may be flushed out of the sample area during your approach and/or set up

period in the space provided at the bottom of your record sheet, indicating that waterfowl left the area just prior to the survey.

Record all waterfowl species seen within the survey area during the 10minute period. If possible distinguish between male and female adults where possible and the numbers seen (including individual ducklings making up broods) in the appropriate space on the attached record sheet. Use a separate column for each sample site, identifying the site # at the top of the column. Also note any ducks that fly over, through, or out of, your sample area at the bottom of the reporting sheet.

Do not guess! It is entirely acceptable to record a species as unknown. You should be certain of the identity of a species before recording it. Birding workshops and informal bird watching excursions in your local area will make you proficient at identifying species common to your area in no time! If you find that you are recording several unknowns….that is perfectly acceptable. As years go by, you will become more and more adept at identification.

Additional Information to Record

If you are able to identify other, non-waterfowl, species of birds either by call or site in the vicinity of your survey area, please enter those in the space provided at the bottom of the appropriate column on the reporting sheets.

Excessive disturbance or noise from a number of sources (people talking, vehicles, farm equipment, boat traffic, etc.) could influence the behavior and movement of waterfowl that you are monitoring. Please take time to record any type of disturbance at the bottom of your reporting sheet (under the appropriate column corresponding to your survey site).

General / Safety Considerations

It is important to be mindful of the tides and the wetland (damp, soft, slippery) habitat that you may be asked to survey near, making personal safety your top priority**.** Further, if survey locations fall on private property, first seek permission from the land owner to access the property.

It is important throughout your survey that you aim to cause as little disturbance as possible to the birds that you are viewing, considering that many ducks will either be raising broods at the time of your survey or preparing for long migrations and a high level of disturbance could mean an impact on waterfowl foraging. If you approach an area and it seems to be causing a hen to separate from her ducklings, leave the area. If you approach an area and an adult seems at all aggressive (i.e. Canada goose hissing), leave the area. Common sense is important; don't put yourself or the birds that you are watching in jeopardy.

Finally, **have fun!** The intent behind this survey is to have an enjoyable community waterfowl-monitoring effort**. Not every person has to commit to monitoring all of the same survey locations every year**, but your birding group may find it more manageable to have the same person (or group) monitor the same few sample locations year after year**.** If certain people in your community live close to certain survey sites, have special knowledge of certain sample sites or have a strong desire to sample certain sites year after year…..feel free to organize your survey group accordingly. Similarly, if you would like to rotate the groups of sites making up your larger survey area amongst your birding group that is acceptable, as long as the non-productive sites are factored into how you distribute the sites amongst volunteers.

What Will Happen to The Data?

Each year data sheets will be returned to EHJV staff who will compile the information to maintain a database on the diversity and abundance of waterfowl usage of the wetlands in question. This information is available on request but summary results will be forwarded to participants each year to keep you up to date on how your wetland and waterfowl are doing.

Feedback

We would appreciate learning more about any problems that you might have encountered with this protocol and would welcome any suggestions for improvement. The Eastern Habitat Joint Venture can be contacted anytime using the contact information enclosed.

The Completed Survey Sheets Should Be Returned To:

NL Eastern Habitat Joint Venture
Wildlife Division - Department of Environment and Conservation
P.O. Box 2007 • 117 Riverside Drive
Corner Brook, NL • A2H 7S1
Phone: (709) 637-2006
Fax: (709) 637-2032

EHJV Community-Based Waterfowl Monitoring Reporting Sheets

Sheet #____ of ____ Date DD/MM/YY

Weather Conditions

Visibility:
Wind:
Temperature:
Precipitation:

**MFUD = Male/Female/Adult of Unknown Sex/Duckling*

Waterfowl Species	Site # ____ Start Time: End Time:				Site # ____ Start Time: End Time:			
	M	F	U	D	M	F	U	D
American Black Duck								
American Wigeon								
Blue-winged Teal								
Canada Goose								
Common Goldeneye								
Common Loon								
Common Merganser								
Eurasian Wigeon								
Greater Scaup								
Green-winged Teal								
Long-tailed Duck								
Mallard								
Northern Pintail								
Northern Shoveler								
Red-breasted Merganser								
Ring-necked Duck								
Other:								
Disturbance in the area								
Non-waterfowl species in vicinity of survey area								
Waterfowl moving through, into/out of, or over survey area								

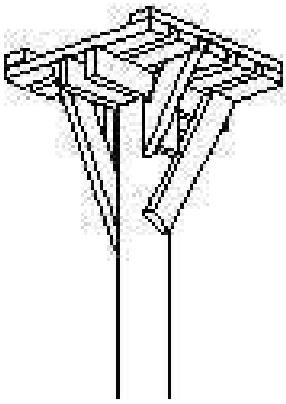
APPENDIX 6
Potential Artificial Osprey Platform

Instructions/Material for Artificial Osprey Platform Construction:

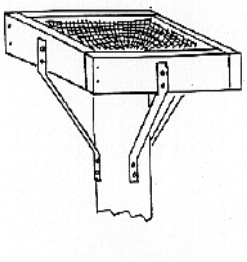
Quite a number of osprey artificial nest designs have been developed for different habitats and sites. One of the more suitable designs for Winterland is the Minnesota Design. This structure is mounted on a single pole (i.e. untreated telephone pole) at least five meters above the ground. All nail and bolt holes are pre-drilled to prevent splitting. The wire mesh is nailed in the platform. Steel braces are bolted to the platform and the lag screws are used to secure the platform to the pole. Some sticks should be wired to the nest to help stimulate nest building. The use of tamarack larch or cedar is highly recommended.

Nesting structures should be placed within fifty (50) meters of water and at least one hundred meters from the nearest residence. Regular inspection of the structure is necessary. After a few years some nests become quite large because the osprey continually adds new sticks. This weight may cause support structures to break. If the nest does become large, it is often a good idea to remove some nest material outside of the breeding season. With proper construction and maintenance, the nest structure may last up to fifteen to twenty years. It is not uncommon for several years to go by without osprey use of the artificial structure. Only an osprey can ever truly know what an osprey seeks during placement of nesting structures!

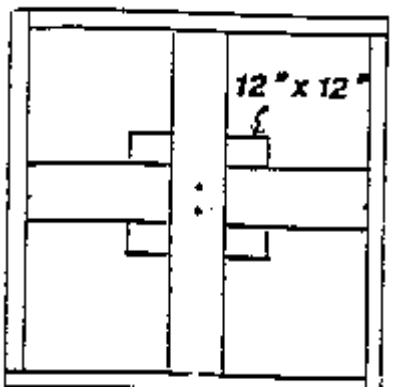
Osprey Platform (Images Courtesy of the Minnesota Raptor Centre):



1) Platform View

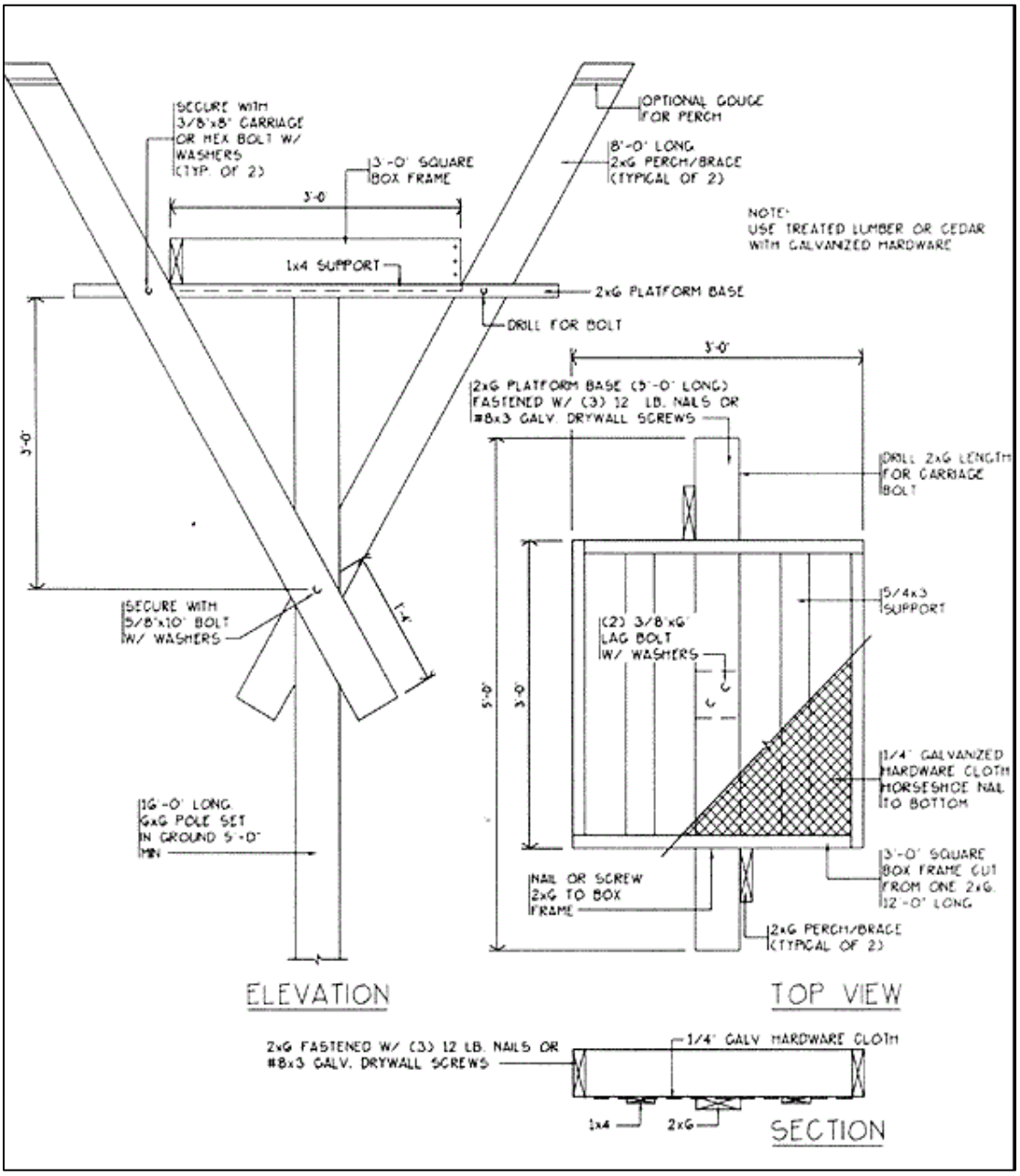


2) Platform side-view



3) Osprey platform top view

Artificial Osprey Platform Design



APPENDIX 7
Potential Constructed and Floating Islands

Instructions/Material for Constructed and Floating Islands:

1.) 2m X 2m floating island constructed from high modular polypropylene floating booms and heavy gauge mesh:

Photo Courtesy of "Water Lines"

2.) 3.5m octagonal floating island constructed from high modular polypropylene floating booms and heavy gauge mesh:

Photo Courtesy of "Water Lines"

3.) By adding a floating island to a pond you will see dramatic improvements in the ponds water quality as well as the habitat for waterfowl. Islands are ideal for ponds surrounding towns to help improve wetlands as well as the habitat for waterfowl and other wildlife species. Visit CanadianPond.ca for more details.

Photos Courtesy of "Canadian Pond Products Limited"

4.) Installation of floating island in the United Kingdom By "Water Lines" Staff:

Photo courtesy of "Water Lines"

5.) Image of a timber rock crib installed in Kingsford, Mississippi by the Pine Creek Watershed Conservation Project. A proper crib is built from new, square-cut timber, not wire or driftwood or round logs tacked together with small nails. The timbers are assembled into a slatted, box-like affair. The box is then filed with rock and can weigh up to several tones:

Photo Courtesy of "Pine Creek Watershed"

6.) Image of a timber rock crib being installed in Kingsford, Mississippi by the Pine Creek Watershed Conservation Project. High quality construction would be essential to placement of this style of rock crib within the Shearstown Estuary to withstand ice and winter storm conditions. Design may have to be modified to deal with specific conditions existing within the estuary:

Photo Courtesy of "Pine Creek Watershed"

APPENDIX 8
Design and Dimensions for Cavity Nest Box