

A photograph of a pond with ducks swimming. In the background, there is a wooden deck and some reeds. The text is overlaid on a semi-transparent white box.

Habitat Conservation Plan for the Town of Stephenville Crossing

Prepared with assistance from the
Department of Environment and Conservation
Wildlife Division
2013

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Section 1: Plan Overview:

Plan Preface:

In Newfoundland and Labrador, some of the waterfowl and 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 Stephenville Crossing was identified as having just such ecologically valuable, and unique, wildlife habitat located within its municipal planning boundary.

The Town of Stephenville Crossing signed a Municipal Stewardship Agreement in 1995 pledging their commitment to conservation and protection of wetlands and coastal habitat within a specified area. In accordance with this agreement, Stephenville Crossing manages these areas with technical advice provided by the provincial Wildlife Division, in part via this Habitat Conservation Plan.

The Town of Stephenville Crossing will use this Habitat Conservation Plan as a guide to govern activities which impact wetlands and waterfowl in order to minimize negative impacts within the areas designated for conservation.

Plan Goals:

- (1) To conserve wetlands and coastal habitat located within the designated Management Unit and to promote wise use of that wildlife habitat.
- (2) To maintain and/or increase wildlife use of those areas, particularly by waterfowl, seabirds and other avian species.
- (3) To increase public awareness of the importance of habitat for conserving waterfowl, seabirds and other wildlife.

Plan Objectives:

- (1) To present a general assessment of the wildlife habitats and wildlife species designated for conservation.
- (2) To recommend conservation and enhancement strategies for the Management Unit.
- (3) To describe potential initiatives for education and awareness among the public in order to increase support of the Town's citizens.

Section 2: Wetland Conservation in Newfoundland and Labrador

Introduction

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.

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 EHJV Wetland Stewardship Program

Wetlands have historically been affected by heavy development pressure. In Newfoundland and Labrador development pressure occurs regularly and most often within municipal boundaries. As such, wetlands 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. Municipal Wetland Stewardship is perhaps the most successful component of the Eastern Habitat Joint Venture in Newfoundland and Labrador. Its principle goal is to help make municipalities, corporations, developers, landowners, and other wetland habitat stakeholders more aware of the value of wetlands 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 wetland areas and local ecosystems as a whole.

This component of the program focuses largely upon signing Stewardship Agreements with municipalities, corporations and individual landowners who own or manage significant wetland habitat. A Stewardship Agreement represents a formal public commitment by a community, corporation, individual and the province, to act together to conserve wetlands for waterfowl. By signing a Stewardship Agreement, communities, corporations and individuals become an important link in a continental chain of conservation areas. To date there are twenty-eight municipalities in the province who have signed Municipal 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) and Burgeo have also been involved with

the signing of Landowner 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 (Stephenville Crossing 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 significant habitat areas that have been identified as important to wildlife. Management Units are intended to be incorporated as environmentally "sensitive areas", "conservation areas" or "protected areas" within municipal planning documents 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 (Current map found in Appendix 2). 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. In the case of a municipal agreement, once the Habitat Conservation Plan has been accepted by council it is intended that it will be then incorporated into the town's existing or future municipal plan, operating plan or master plan for use during future development decisions. 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 generally 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 EHJV 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.
- 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 Waterfowl in Stephenville Crossing

The Town of Stephenville Crossing

Stephenville Crossing is a seaside town which has been incorporated since 1958. Early settlers in the community worked in the fishing, farming, logging and construction industry, and once the Earnest Harmon Air Force Base started in 1941, the community population increased from 925 to 1945. Today the population is approximately 2000 and the major source of employment is the hospital in Stephenville and other areas within the construction and service industries. The Natural History Society of Newfoundland and Labrador cites 198 species of birds are found within “the Crossing”, 74 of which are common, 55 uncommon, 26 very uncommon, 36 rare and 7 are very rare. To help conserve this diversity of wildlife and enhance existing waterfowl and wildlife populations, a conserved area, known as a “Management Unit” has been created in the Town of Stephenville Crossing.

Description of the Management Unit

St. George’s River Management Unit (3931 acres)

The St. George’s River Management Unit is made up of: A) Nardine’s Pond, B) Little River, C) Main Gut, and D) the estuary of Harry’s River and a portion of the St. George’s River estuary. The northern boundary of the Management Unit follows the transmission line while the other boundaries follow the shoreline and wetland edges (Figure 1). This Management Unit supports a wide diversity of avian species (Appendix 3).



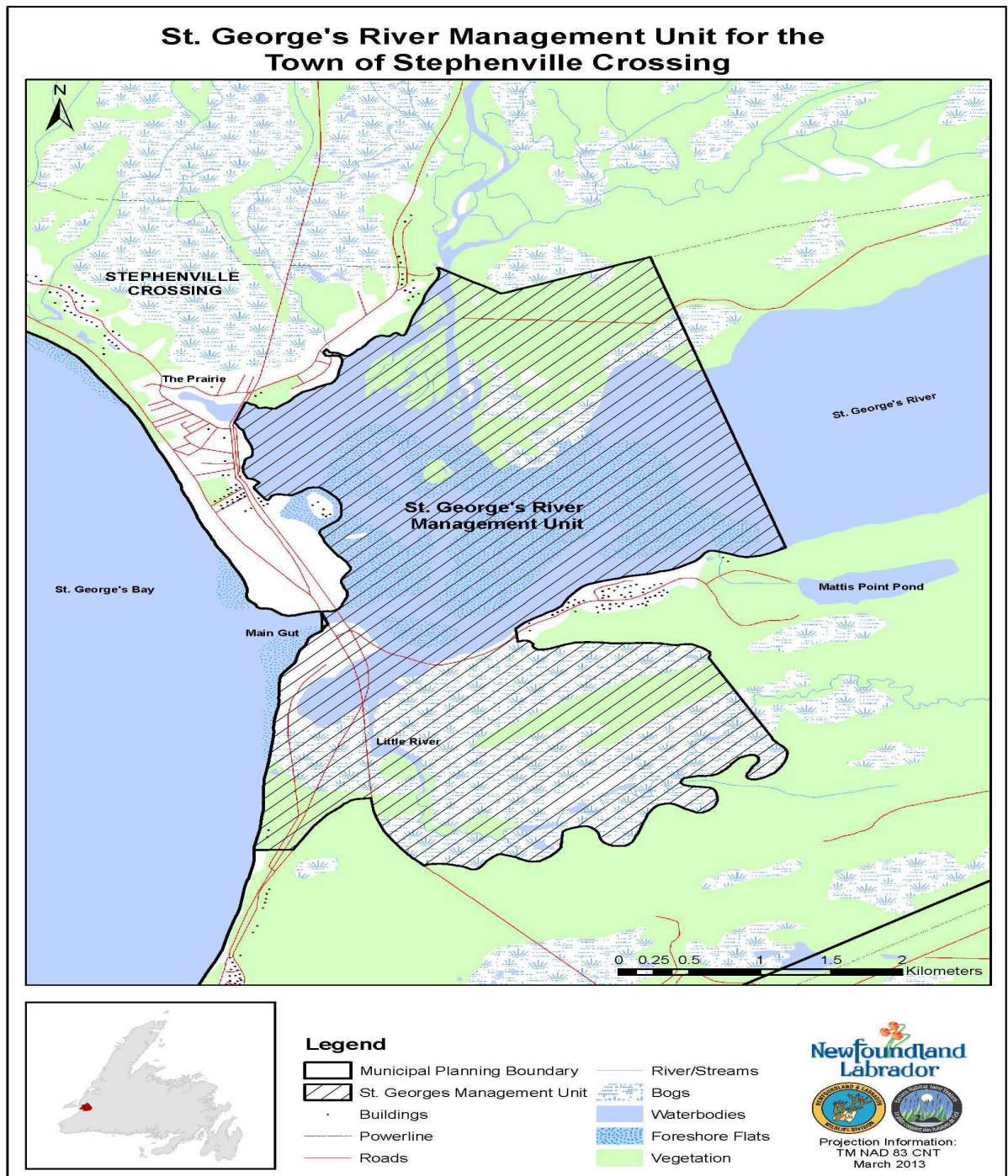


Figure 1 - Map and overview photo of St. George's River Management Unit.

A. Nardine's Pond

Nardine's Pond is a small brackish pond that was once a part of Little River but was created as a result of the railway and highway dividing the two into separate water bodies. Due to the low shoreline index and lack of emergent vegetation, this pond would not normally rate very highly for waterfowl. However, the shallow water and sandy bottom has provided the right conditions for the growth of a variety of species of pondweed, the largest of the seed-bearing aquatics. One pondweed species in particular, *Stuckenia pectinata*, or sago pondweed, is the outstanding species in this genus. This species produces an abundance of large seeds, has a palatable tuber, and has edible stems, leaves and rootstocks. There is also an abundance of invertebrates associated with this plant that provide an important part of the diet of young waterfowl.

The shore surrounding Nardine's Pond consists mostly of bog with extensive sphagnum, crowberry and cranberry cover. The pond edge has many reeds and tall grasses making it a good nesting and brood rearing site, particularly for the American wigeon. In the spring and fall it is an important moulting area for Greater scaup males and a staging area for various waterfowl, including Canada geese.



Figure 2 – Nardine's Pond in St. George's River Management Unit.

B. Little River

Little River is a small, meandering river that flows into the St. George's River Estuary. It is separated from Nardine's Pond by the T' Railway and highway and provides good riparian habitat along both sides of the river where various species of waterfowl have been known to nest. Little River was one of the few places in the province where *Sagittaria latifolia*, arrowhead, had been identified. This is one of the tuber-forming arrowheads that is recognized as having considerable value to wildlife, particularly muskrat. Unfortunately, arrowhead has not been seen in this area since the plants were harvested for transplantation to another site. Many pondweed species are found in Little River and hardstem bulrush (*Scirpus acutis*), another important aquatic plant species, is also present. The hard-coated seeds of this bulrush provide excellent food for waterfowl and the plant itself provides important cover. Northern pintails are commonly seen here, and it is an important brooding area for American wigeon. In 2000, a wood duck was seen using a nest box on Little River (Bill Winsor, 2000 (nf.birds)).



Figure 3 – Little River in St. George's River Management Unit.

C. Main Gut

The Main Gut contains a patterned fen/slope bog complex, as well as extensive beach and sand dunes, and is an important area for a variety of reasons. Historically, the beach and dunes to the south of Main Gut have been used by the endangered Piping plover, and this habitat is presently used by other shorebirds such as Killdeer and Spotted sandpiper. The beach and dune system act as a buffer to mitigate the potential effects of wave action on Nardine's Pond. This is a good place for viewing osprey, with as many as twenty-five having been seen at one time, hovering and diving for flatfish and sculpins.

The shallow areas within Main Gut provide are good feeding areas for osprey and nests are located at several sites throughout the Management Unit. As the Main Gut area remains ice-free year-round, significant concentrations of birds also occur here during late winter. The most common species of waterfowl seen during this time are Greater scaup, Common goldeneyes and Mergansers. Rarities such as Barrow's goldeneye are sometimes seen during the winter.



Figure 4 – Main Gut in St. George's River Management Unit.

D. St. George's River/Harry's River Estuary

The St. George's River/Harry's River Estuary is one of the richest areas for waterfowl in Newfoundland and is highlighted in a 1987 Environment Canada document entitled A Profile of Important Estuaries in Atlantic Canada. The habitat consists of tidal sand flats and salt marsh. Extensive green algal mats are evident at low tide. The abundance of eelgrass, invertebrates, arthropods, mollusks, and fish provide rich feeding for a variety of birds such as terns, gulls, shorebirds and other migratory birds during spring and fall migration. It is also a significant wintering area for Common goldeneyes and Mergansers.

During the summer, the margins of the estuary have been used for brood rearing by Black ducks and Northern pintails. During the summer and fall the estuary is an important feeding area for a host of shorebirds including Killdeer, Sanderling, Greater yellowlegs, Black-bellied plover and, occasionally, the endangered Piping plover. Terns, both arctic and common, have been observed in this area. A number of Common tern nests have been located on the grassy islands surrounded by mud flats. The shallow water of this area attracts common and arctic terns from other nearby breeding colonies at Sandy Point. Caspian terns, Black-headed gulls and Bonaparte's gulls are also seen in this area. The estuary is one of the premiere places in the province to observe osprey feeding on the abundance of fish found in the waters there.



Figure 5 – St. George's River/Harry's River Estuary.

Existing Land Use and Its Potential Impact on Wetlands and Waterfowl

Hunting

It is the assessment of the EHJV that hunters play a significant role in conserving migratory bird populations 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 migratory bird hunting. Complying with non-toxic shot regulations will also help conserve the health of bird populations and their habitats.

Waterfowl hunting is common at most wetland areas around Stephenville Crossing, especially for Black duck, Common goldeneye, and Canada geese. However, the lower portion of the St. George's River and much of the town residential footprint, was designated a no hunting (shooting) zone in 1995 at the request of the Town Council and the, then, St. George's River Conservation Society. This No shooting designation, as such, applies to the majority of the management unit.

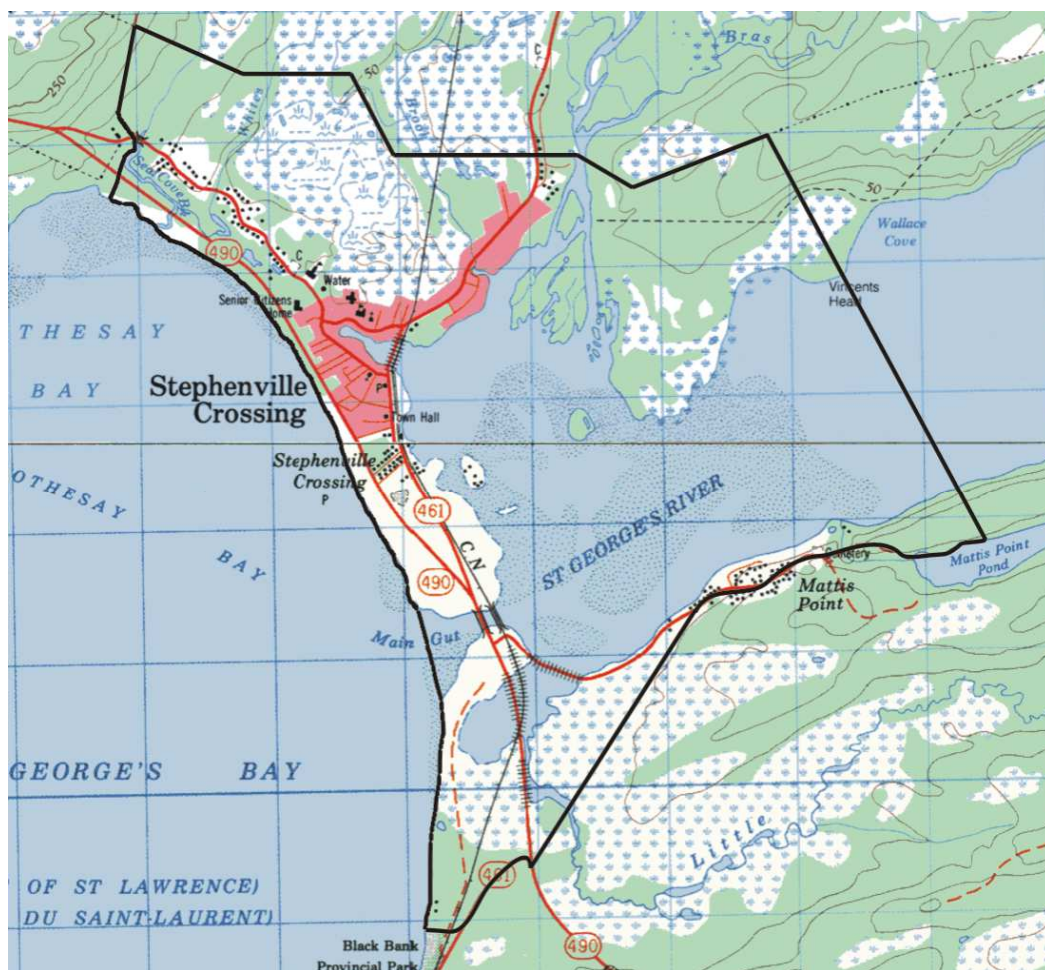


Figure 6 – Map of Stephenville Crossing's No Hunting (Shooting) Zone.

Fishing

Recreational angling for Atlantic salmon, Brook trout and Smelt takes place at Little River, Main Gut and other areas including Harry's River which is a licensed salmon river. Scallop, clam and mussel beds are found in the Stephenville Crossing area. Clams are harvested from the extensive sand flats that are exposed at low tide.

Licences have been traditionally issued for catching eels in the mouth of Little River. Concern has been expressed with regards to bycatch of waterfowl and early morning disturbance to nesting waterfowl; however this disturbance should be minimal as the eel fishery runs from August to November annually. Additionally, the eel fishery has declined significantly in recent years.

No restrictions to the current fishing practices are deemed necessary. However, fishers should be reminded that waterfowl are easily disturbed during the nesting and brood raising period (May to mid-July). If fishers 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. Recreational fishers are reminded to use caution and ensure that waste monofilament fishing line is not left behind as it can easily entangle waterfowl and other wildlife. Lead sinkers can be ingested by waterfowl leading to lead poisoning.

Timber Harvesting

Corner Brook Pulp and Paper Limited has timber rights within Stephenville Crossing and domestic wood harvesting also occurs in small amounts due to the limited availability of productive forest. Wood harvesting is not permitted within the management unit but there is little productive forest in this area.

All-Terrain Vehicle (ATV) Use

There is significant all-terrain vehicle (ATV) use in Stephenville Crossing. ATVs are commonly used by fishermen throughout the summer to travel to fishing locations, in particular near the Main Gut. In 2000, by-laws concerning ATV use within the Management Unit were devised by the Town Council, in addition to provincial legislation, and prohibit the use of ATVs within the town boundaries except on the T-Railway, a provincially approved route. One of the largest problems affecting the conservation of critical areas in the Management Unit is the careless use of ATVs and dirt bikes, especially over sand dunes and beaches in the Main Gut area which are nesting habitat for the endangered Piping plover. Wise-use practices as they relate to the Piping plover are outlined later in this document.

Litter

Existing community pride and clean-up efforts have resulted in the estuary and beaches being quite clean. Citizens should be encouraged to maintain this ethic.

Rare Plants

To be designated as rare in Newfoundland and Labrador, plant species must be native and found in twenty or less locations across the province. In Newfoundland, rare plants are often found in the unique habitats of sand dunes and salt marshes behind beaches. Stephenville Crossing has both of these rare habitats and many rare plant species are found in the area. In fact, Stephenville Crossing has been identified as one of the most important areas on the Island of Newfoundland for rare dune and salt marsh plants.

Thirteen plant species that are considered extremely rare in Newfoundland are found in the St. George's area: *Anemone virginiana*, *Calla palustris*, *Carex silicea*, *Hordeum jubatum*, *Juncus subtilis*, *Polygonum raii*, *Puccinellia ambigua*, *Ranunculus recurvatus*, *Sagittaria latifolia*, *Spartina alterniflora*, *Spartina patens*, *Sphenopholis intermedia*, and *Trisetum melicoides*. Extremely rare is defined as occurring at five or less localities in Newfoundland and Labrador. A list of the plant species (with ranks where appropriate) documented to date are listed in Appendix 4.

The Banded Killifish

The Banded killifish (*Fundulus diaphanus*) (Figure 7) and the habitat in which it lives should be considered when making decisions for areas that are near or adjacent to wetlands. It was first discovered in this province by Chippett in 1951 near Stephenville Crossing. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) currently lists the Banded Killifish as a species of Special Concern, while it is listed as Vulnerable under the provincial *Endangered Species Act*. The primary reason for listing is its limited distribution. The banded killifish has only been found in several locations on the west coast, the northeast coasts and the Burin Peninsula.



Figure 7 – Banded Killifish

Habitat degradation and wetland drainage would likely be causes of possible future population decline in this species, and contaminants such as pesticides can harm or even kill these fish. This fish is preyed upon by Brook trout, Atlantic salmon, American eels and waterfowl. Expansion of populations is also unlikely because of restrictions on immigration caused by rivers with steep gradients and other barriers.

The Piping Plover

The Piping Plover (*Charadrius melodus*) is a small (18 cm; 43–63 g) migratory shorebird. It is highly cryptic, with a sand-colored back and head, white underparts, and orange legs. In breeding plumage (Figure 8), the short bill is orange with a black tip, a single black band stretches between the eyes, and another black band runs across the breast.



Figure 8 – Piping Plover

The Piping Plover establishes territories, lays eggs and raises young on the open beach between the ocean and sand dunes. Camouflage is the Piping Plover's main defense. The sand-colored adults, chicks and eggs are very difficult to see.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent group of nationally recognized experts, who assess data on wildlife species considered potentially “at risk” in Canada and place them in one of five categories: extinct, extirpated, endangered, threatened, or special concern. COSEWIC's assessment process is based on a rigorous criteria system that not only recognizes scientific sources but also places a significant emphasis on information from the people who live on the land and have an intimate familiarity with the animals and plants around them. In 1985, COSEWIC designated the Piping Plover as Endangered. It is also designated as an endangered species under the Province's *Endangered Species Act*. The ESA of Newfoundland and Labrador seeks to ensure the recovery of species deemed to be at risk. The Act makes it an offence to harm an endangered species with individual fines ranging from \$1,000 to \$50,000 and/or 3 months imprisonment upon first conviction. Corporation fines can range from \$2,000 to \$100,000 upon first offence. Additionally, the court may impose a fine of less than or equal to \$10,000 for each day the offence continues.

Also, the Piping Plover is listed on Schedule 1 of the Federal *Species at Risk Act* (SARA). The Government of Canada's *Species at Risk Act* (SARA) is designed as a key tool for the conservation and protection of Canada's biological diversity and fulfils an important commitment under the United Nations Convention on Biological Diversity. The Act seeks to complement other existing federal, provincial and territorial legislation protecting wildlife. The purpose of SARA is stated as to prevent wildlife species from becoming extinct or extirpated (lost from the wild in Canada); to help in the recovery of extirpated, endangered or threatened species; and to ensure that species of special concern do not become endangered or threatened. SARA is just one of three major components in the Government of Canada's Strategy for the Protection of Species at Risk. The second component is the federal Accord for the Protection of Species at Risk a general policy document

endorsed by the provinces, territories and the Government of Canada. The third component is Environment Canada's Habitat Stewardship Program for Species at Risk (HSP) which provides funds for the implementation of recovery plans for species at risk.

Reproductive success of the Piping plover is limited in Newfoundland primarily because of disturbance and nest predation. In 2010, there were only 55 adult Piping plover 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 and possible destruction by vehicles such as ATVs/dirt bikes, dogs, and in some cases deliberate destruction by humans. These disturbances can cause nests to be abandoned. Other limiting factors include adverse weather conditions and nest predation most commonly by gulls, crows and foxes.

Both Federal and Provincial endangered species legislation requires that critical habitat be identified. Critical habitat is defined in the Federal *Species at Risk Act* as "the habitat that is necessary for survival or recovery of a listed wildlife species..." In Stephenville Crossing Seal Cove Beach and Main Gut Beach have been declared critical habitat based on their historical significance to breeding plovers (Figure 9). However, regulations have not yet been developed to outline how these critical habitat areas will be managed to allow Piping plover populations to persist. In the interest of adopting a common approach to conservation, a code of conduct for Piping plover beach users has been established.

1. Obey signs restricting use of motorized vehicles on beaches during the breeding season (May 1 to August 31).

A central factor confronting the plovers in Stephenville Crossing is the use of all-terrain vehicles/dirt bikes on Piping plover nesting beaches. Inappropriate use of these vehicles on critical beaches used for breeding and chick-rearing by the plover has been documented to result in destruction and/or abandonment of nests and eggs and has possibly caused the death of chicks and adult birds.

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 Stephenville Crossing and understand that the loss of one bird or one nest can have implications for the entire provincial population of birds.

Signs will be used as a mechanism to keep people from using motorized vehicles on two portions of the Stephenville Crossing beach, namely Seal Cove and Main Gut, where breeding birds have been observed. Each year, around the first of May, signs are placed on the beaches prohibiting the use of ATVs/dirt bikes in these specific

areas during the plover breeding season. Signs will be located at major entrances to the beaches and numerous signs will be placed nearby possible nesting locations. Conservation officers will conduct patrols of the beaches and will be able to issue 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 (i.e., nest site) they could also be charged under the *Endangered Species Act* which would have even more significant consequences up to and including jail time. At the end of the breeding season (~August 31st), or should a formal census indicate that no breeding birds are present (~mid-June), the signs will be removed.

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

Piping plovers are easily disturbed. Even someone hanging around the beaches trying to get a picture 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.

Stephenville Crossing 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 affected by beach users, all human activities should be conducted away from nesting or feeding areas. To ensure that this happens symbolic fencing can be used to outline plover nesting areas during the breeding season. Symbolic fencing consists of cordoning off an area surrounding a nest in an effort to prevent foot and vehicle traffic. This type of fencing increases plover productivity by indicating to beach users to avoid these areas, thereby minimizing disturbance created by human activities around nests and occasionally unfledged young. Symbolic fences may only be erected with the written permission of the Canadian Wildlife Service.

3. Do not remove natural debris such as driftwood.

Not only can the Piping plover be disturbed when individuals walk along the beach to remove the debris, but beach cleaning removes important components of plover habitat. Things such as wrack and other natural debris provide feeding areas and shelter from inclement weather for the plover.

4. Remove trash and food scraps.

Predation has been identified as one of the most important factors limiting populations of Piping plover across the North American breeding range. Trash, food scraps, and dead fish attract predators. These predators will also hunt or opportunistically take adult Piping plover, chicks, or eggs. Therefore, it is important for beach users to not litter in the first place, but also to remove any trash they may see lying on the beach.

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 Stephenville Crossing 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, and kill chicks. Even when these pets are on leashes, they can frighten Piping plover and prevent feeding.

All pets should be kept on a leash (less than 6 feet) and walked at the water's edge to prevent them from disturbing Piping plovers or their habitat. 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 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. Protect the dune systems by limiting ATV/dirt bike activity to designated trails and by not burning beach grasses.

Beaches and dunes are important feeding, breeding, and nesting grounds for Piping plover. In Stephenville Crossing these beaches and 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. 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 and resulting in loss of important Piping plover habitat.

8. Promote public education and awareness.

The Town and its residents should do their best to spread the word about the endangered Piping plover and the difficulties they face on Stephenville Crossing beaches. Residents should also be aware and supportive of the work of Beach Guardians. Piping Plover Beach Guardians have been hired in recent years on the southwest coast of Newfoundland and work during the summer breeding season, primarily in an educational capacity, to reduce levels of human disturbance around nest sites or broods. Guardians seek to educate beach users who are utilizing piping plover nesting areas.

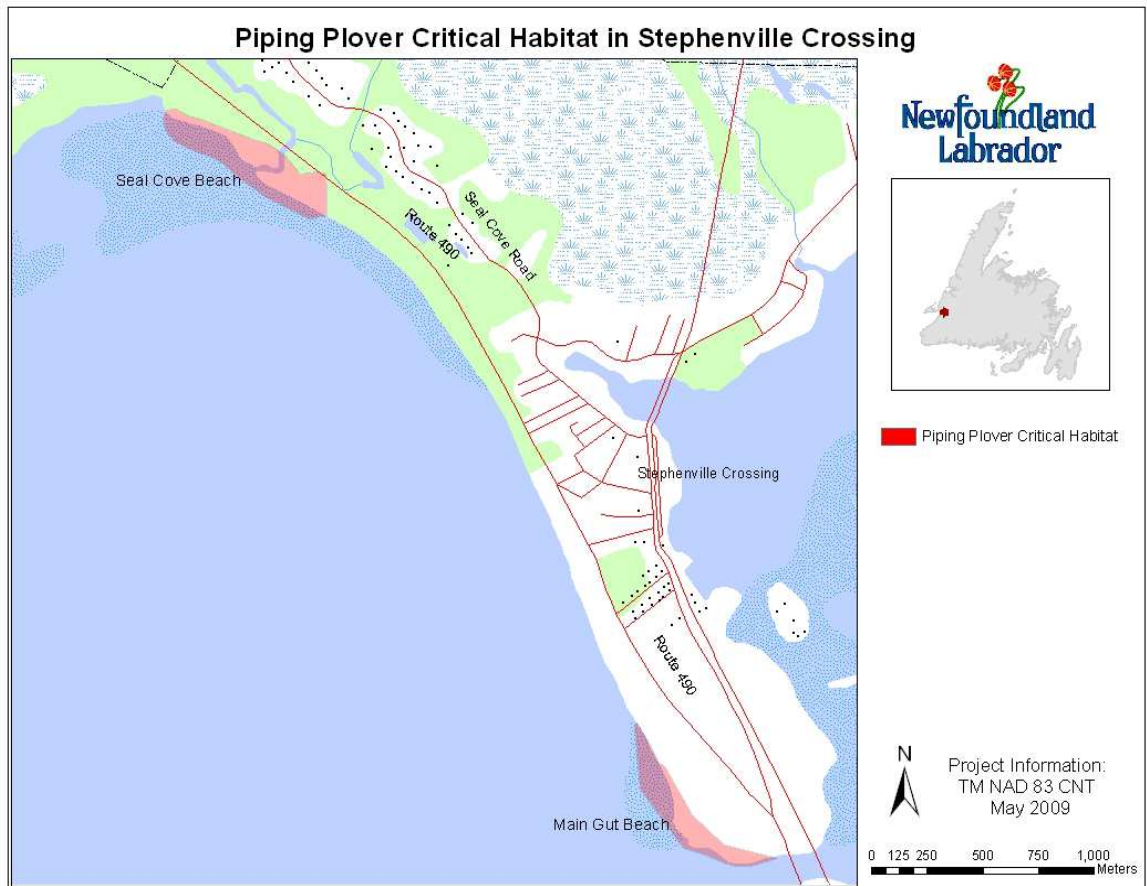


Figure 9 – Map of Piping Plover Critical Habitat in Stephenville Crossing.

Section 4: General Policies for Wetland 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 wetland habitat areas contributing to waterfowl presence and abundance in North America. Further, the Town of Stephenville Crossing has committed to using this Habitat Conservation Plan as a guide to best management practices in and around wetlands, and associated uplands, significantly within the Town's Management Unit. 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 Unit 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 habitats 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 Unit

Activities within the Management Unit 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 the Management Unit. 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 Unit should be forwarded to staff of the Wildlife Division for comment with a thirty (30) day notice period.

Incorporation of Management Unit in the 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 Unit, 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 Unit, the Town Council will consult with staff of the Wildlife Division providing a thirty (30) day window of notice for comment.

Riparian Buffers in the Management Unit

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, for 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 riparian areas also affects how readily water enters 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 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 also serve as a food source for a variety of wildlife when leaves and insects/insect larvae drop into the water body off of 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 minimum protection around all waterbodies and marsh areas and is considered critical within the designated Management Unit. Agriculture and cabin development seem like the two most likely disturbances to riparian vegetation.

Management by Committee

It is recommended that Towns 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. Indeed, in our view, the historical efforts of the St George’s Conservation Society and the now Stephenville Crossing Environmental Conservation Committee have had a significant positive impact on conservation and community involvement.

Section 5: Wetland Conservation and Education Strategies

This section will serve to offer ideas for habitat conservation, enhancement and education. As such, it includes recommendations and advice for conserving, enhancing and/or managing wetlands and associated upland habitats for the benefit of waterfowl and wildlife. It should be understood that opportunities to implement these strategies may only arise over time or that the specific recommended activity may not be appropriate given particular circumstances of an individual town. As such, the Town is in no way obligated or required to implement any or all of the following recommendations and should seek out advice from the Wildlife Division if seeking to implement them.

Waterfowl Monitoring Program

Staff of the Wildlife Division have devised an easy to use Community-Based Waterfowl Monitoring Protocol (see Figure 10 and Appendix 5) and will assist community partners in its implementation. It is hoped that Towns, local community interest groups, and interested volunteers (often bird-watchers) will establish a Waterfowl Monitoring Program within areas of the Town but, particularly, within the designated Management Unit. 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 (e.g. 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.



Figure 10 – Waterfowl Monitoring Survey in Codroy Valley. *Photos by Wildlife Division staff.*

Recreational Use Development

Recreational walking and bird-watching have become some of the most popular non-consumptive outdoor activities that occur across Canada. In many Stewardship areas there may exist the potential to develop a trail system and/or interpretive signage to allow public access to your community's significant wetlands. This will also help raise in the community the profile of the habitat and the fact that the Stewardship Agreement exists. Trail or other developments should be undertaken in consultation with staff of the Wildlife Division. One of the most effective ways for people to learn is through doing. Bringing young people and members of the general public into special areas (in a natural setting) for the purposes of applied learning would be a critical part of any educational programming planned for the area.

Sustainable, recreational, use of wetlands can be encouraged with the designation of a walking trail whereby foot traffic can be controlled and access to the any fishing, canoeing, or nature-viewing can still be facilitated. Care must be taken during any trail construction so as not to degrade the quality of habitat within the estuary. Trail maintenance will be required and this responsibility should also be clearly understood from the outset. Potential signage, other than interpretation, might include critical times for waterfowl nesting and brood-rearing and could be posted at areas along a walking trail and at a potential parking area to raise awareness of the sensitive nature of the area and to identify the best times to utilize the area to minimize disturbance. Critical times for waterfowl nesting and breeding could also be posted discreetly at points around the ponds and around the Management Unit boundaries.

Several stewardship communities have taken the concept of recreational use of their stewardship areas a step further, actually building "Interpretation Centers" in strategic locations targeted to bring residents and visitors into the conservation area to enjoy and learn about the wetlands and wildlife (Appendix 13). These buildings, shelters or amphitheatres can serve as wonderful, natural locations for certain educational programs and seasonal community activities where a more permanent venue is appropriate. This type of project would lend itself to specific sources of funding or grants (e.g., Commercial Building Incentive Program). Other venues of this sort have been funded and assisted in core-funding by industry leaders like Petro Canada (Fluvarium) and Irving Oil (the Irving Eco-Centre).

Conservation Corps Green Teams

The Newfoundland and Labrador Conservation Corps annually sponsors "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 Municipal Wetland Stewardship Agreements. An example of a potential project is the construction and installation of waterfowl nest boxes and nesting platforms (for geese) 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 Management Unit.

Artificial Nesting and Loafing Structures

Geese:

The use of artificial structures to provide nest sites for Canada geese began almost 70 years ago across North America. These structures are among the most widely used, and successful, goose management practice (Figure 11). Nesting structures are intended to increase nest success in the face of predation or flooding. Success usually reaches levels of 85-90% versus 65-75% on natural islands or marshes. Generally, nesting pairs continue to use natural sites (i.e., they do not “switch” over to an artificial structure). Artificial structures work towards increasing a population’s base from an established area outwards and towards increasing the average productivity of an area.

The advantages of using artificial nest structures for Canada geese are that occupancy is typically high, costs are generally low, structures are adaptable in terms of placement, and results are usually rapid and tangible. One issue often overlooked is the basic maintenance required on an annual basis, to remove old nesting material and to check structure integrity. However, this is often easily accomplished by local school groups, conservation corps teams or local community groups. Selection of appropriate construction material and appropriate nest-building materials along with careful placement at appropriate locations will facilitate long-term durability, necessitate minimal maintenance, and ensure nest structure longevity. Geese with an established nest location generally use that area over and over. Artificial nest structures like nesting rafts, provide nesting locations for the next generation of breeding individuals or for individuals who may have had nests destroyed or disturbed. Commercial goose platforms are also an option. Wildlife Division staff are available to assist during all phases of the construction and placement process of the nesting raft.



Figure 11 – Artificial Nesting Island for Canada Geese. *Photo by Wildlife Division staff.*

Geese are territorial when nest structures are placed closer than ~100 meters, and especially when structures are within sight of one another. Loafing sites should be provided close to the structures. Structures should be placed 10-15 meters from the shoreline so that predators cannot harass nesting birds and should be anchored firmly with enough slack to avoid flooding of the structure during periods of high water. Styrofoam or some sort of flotation device like “fenders” should be installed under the structure to ensure buoyancy and mitigate flooding potential. Given that goslings cannot negotiate a vertical rise of more than four inches, each 6 to 8 inch high nest box would require a ramp six inches wide and oriented at an approximately 45 degree angle. Nesting material placed into the nest box should form a bowl with tapered edges so that the gosling ramps and nest bowl permit the young to exit the nest box.

Maintenance is done in winter, which means easy access to nest structures via snow shoes or skis. Monitoring would also form an important part of the nest raft project to ascertain level of occupancy and nest success. This type of project would be a realistic one for a Conservation Green Team.

Ospreys:

Ospreys are fish eating raptors that are frequently observed hunting in wetland habitats, particularly those along the coast. Unfortunately, populations of these birds plummeted in North America during the 1950s and 1960s 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 1970s, 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 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 the Memorial University Botanical Gardens in St. John's, the Stephenville Crossing area and in Winterland. 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 (Appendix 6) 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.

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. 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 (see Appendix 7). The islands must be positioned so that they are higher than the highest water mark. Hardy shrubs and herbaceous plants (e.g., 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 (e.g., treated wood, contaminated soils, etc.) 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 also consider the potential necessity for annual removal and reinstallation of islands in response to ice conditions in 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.

Nest Boxes

Cavity Nesting Waterfowl:

Cavity nesters such as the Common goldeneye have certain habitat requirements for nesting and 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 12). 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 which will help increase the success of nest box usage. When nest boxes are to be installed, Wildlife Division staff will often include a map of 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.

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 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 beavers 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 neighbouring 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 over 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 ducklings 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.

Constructing and installing nest boxes (Appendix 8) 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 staff of the Wildlife Division working through the EHJV.



Figure 12 – Cavity Nest Box in Cobb’s Pond, Gander. *Photo by Charmaine Barney.*

Roosting and nesting structures for non-waterfowl species:

An off-shoot of a nest box project could be a cooperative project between a Green Team, a local science class and/or a local youth group or business. Individuals could build, install, and monitor a variety of nest structures that might be appropriate for birds like Tree swallows and Northern flicker, for owls like the Great Horned Owl, and for bats (Figure 13), all commonly found around agricultural areas.



Figure 13 – Bat Roosting Box. *Photo by Gerry Yetman.*

Educational Programs

Public education is essential in the development of a greater sense of wetland 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 Guides and Scouts. Certain programs may qualify for external funding through various private enrichment grants (i.e. 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 towns person 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 www.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. A good starting point for videos and educational nature-oriented craft projects for children may include websites like www.hookedonnature.org and www.planetpals.com.

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.

Eel grass (Figure 14) is an aquatic grass and 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 Eel grass 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 Eel grass bed establishment is a project that has been successfully completed in a number of areas across Canada.



Figure 14 – Eel grass

Certain species of willow (*Salix discolor*) and alder (*Alnus crispa*) are native to the island of Newfoundland and are found in areas of the Avalon Peninsula. They are renowned for their hardiness, their ability to withstand tidal inundation, and their extensive network of roots. 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 and snowshoe hare, and bird species like Ruffed grouse and Grosbeaks.

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 (*Ammophila 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.

Hunting

It is the clear intent of the Wildlife Division and the Eastern Habitat Joint Venture that hunting, as a sustainable consumptive resource use activity, be maintained within wetland habitats that contain waterfowl. Some communities have taken it upon themselves to seek to close Management Units to hunting subsequent to signing a Stewardship Agreement. It is important to understand however that the provincial Wildlife Act and associated Wildlife Regulations indicate that shooting is not permitted within 1000m of a school, playground or athletic field or areas that are within 300m of a dwelling. If required, appropriate signage may be developed through consultation with Wildlife Division staff and would need to have the section of the NL Wildlife Act from which the regulation has been quoted – pertaining to the illegal discharge of a firearm – clearly identified (see example in Appendix 9). Placement of no-shooting signs should be left up to the discretion of local Conservation Officers.

Litter Removal

It is strongly recommended that community interest groups, such as a Conservation Corps Green Team, and individual residents work cooperatively to remove any large quantities of litter in and around all portions of the Management Unit on a regular basis, while making certain to avoid those times of year (May to July) when waterfowl may be disturbed during breeding or brood rearing. Programs such as

Ocean Net and Vanaqua Shoreline Cleanup assist communities in organizing litter cleanups. An increase in surveillance by municipal and provincial officials would also help reduce litter and illegal dumping. Another way to help prevent this problem from occurring would be to post signs at access points to wetlands within the community.

APPENDICES

APPENDIX 1:

MUNICIPAL STEWARDSHIP AGREEMENT

THIS AGREEMENT made at *Stephenville Crossing* in the Province Newfoundland
this day of *April* 1995.

BETWEEN: **THE TOWN COUNCIL OF THE TOWN OF STEPHENVILLE CROSSING**
the municipal corporation organized
and existing under the laws of
Newfoundland

(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 Natural
Resources

(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 the waterfowl populations of 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 HERETO 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 the 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 shall permit only those activities within the Stewardship Zone that have no negative or adverse impact upon the wetland habitats or the waterfowl or other wildlife which utilize those habitats.
3. Within the Stewardship Zone, the Parties shall establish the Management Unit 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 the wetland habitats, the waterfowl and other wildlife which utilize 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 affect 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 affect 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. The parties to this agreement shall exercise their best efforts to further develop management measures for the more effectively carrying out 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 Natural Resources in the
presence of:

**THE HONOURABLE THE MINISTER OF
NATURAL RESOURCES**


Witness


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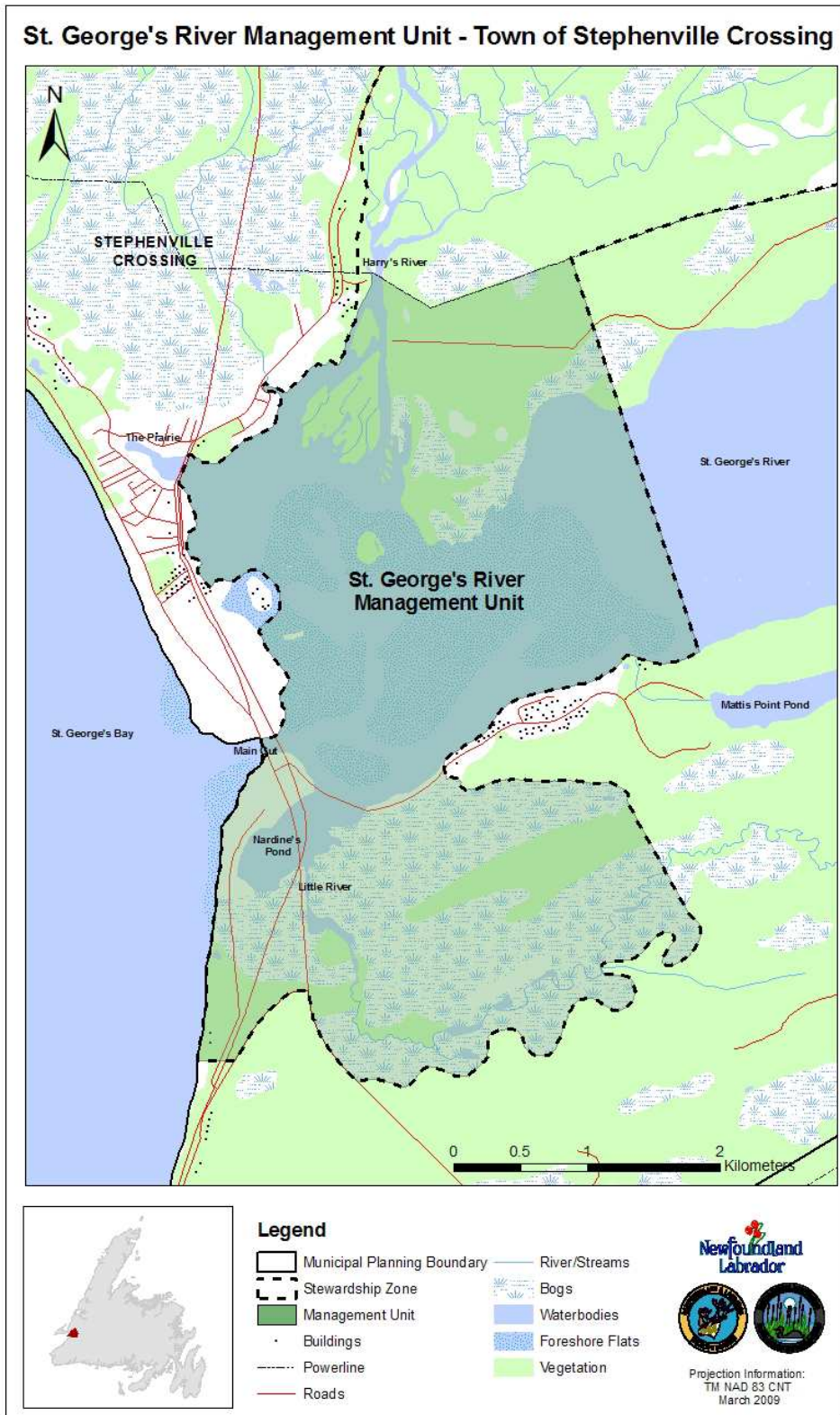
THE SEAL OF the Town Council of
the Town of Stephenville Crossing
was hereunto affixed in the
presence of:

**THE TOWN COUNCIL OF THE TOWN
OF STEPHENVILLE CROSSING**


Witness


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APPENDIX 2 - SCHEDULE "A":



APPENDIX 3: Avian Species of Stephenville Crossing

<u>Common Name</u>	<u>Scientific Name</u>	<u>Occurrence*</u>
<u>Loons</u>		
Common Loon	<i>Gavia immer</i>	CBR
<u>Grebes</u>		
Horned Grebe	<i>Podiceps auritus</i>	XSPSFW
<u>Fulmars</u>		
Northern Fulmar	<i>Fulmarus glacialis</i>	CbR
<u>Storm-Petrels</u>		
Wilson's storm-petrel	<i>Oceanites oceanicus</i>	USPSf
Leach's storm-petrel	<i>Oceanodroma leucorhoa</i>	CBSPSF
<u>Gannets and Cormorants</u>		
Northern Gannet	<i>Morus bassanus</i>	CBSPSFw
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	UBSPSFw
<u>Hérons</u>		
American Bittern	<i>Botaurus lentiginosus</i>	UBSPSF
Great Blue Heron	<i>Ardea herodias</i>	U*SPSFw
Great Egret	<i>Ardea alba</i>	XVSPSFw
Snowy Egret	<i>Egretta thula</i>	XVSPSFw
<u>Geese and Ducks</u>		
Snow Goose	<i>Chen caerulescens</i>	XVSPsF
Canada Goose	<i>Branta canadensis</i>	CBSPSFw
Brant	<i>Branta bernicla</i>	XVSPF
Ring-necked Duck	<i>Aythya collaris</i>	CBSPSFw
Greater Scaup	<i>Aythya marila</i>	UBR
Harlequin Duck	<i>Histrionicus histrionicus</i>	U*bSPsFW
White-winged Scoter	<i>Melanitta fusca</i>	USPSFw
Bufflehead	<i>Bucephala albeola</i>	U*SPsFW
Common Goldeneye	<i>Bucephala clangula</i>	CBR
Barrow's Goldeneye	<i>Bucephala islandica</i>	U*SPFW
Hooded Merganser	<i>Lophodytes cucullatus</i>	XbspsFw
Common Merganser	<i>Mergus merganser</i>	UBR
Red-breasted Merganser	<i>Mergus serrator</i>	CBR
Wood Duck	<i>Aix sponsa</i>	U*SPsFw
American Wigeon	<i>Anas americana</i>	UBSPSFw

Eurasian Wigeon	<i>Anas penelope</i>	U*spFw
American Black Duck	<i>Anas rubripes</i>	CBSPSFw
Blue-winged Teal	<i>Anas discors</i>	UBSPSF
Green-winged Teal	<i>Anas crecca</i>	CBSPSFw
Northern Shoveler	<i>Anas clypeata</i>	XbSPSF
Northern Pintail	<i>Anas acuta</i>	UBSPSFw
Mallard	<i>Anas platyrhynchos</i>	U*SPSFw
Gadwall	<i>Anas strepera</i>	XVSPF

Ospreys, Eagles, Hawks and Falcons

Osprey	<i>Pandion haliaetus</i>	CBSPSFw
Bald Eagle	<i>Haliaeetus leucocephalus</i>	UBR
Northern Harrier	<i>Circus cyaneus</i>	UBSPSFw
Sharp-shinned Hawk	<i>Accipiter striatus</i>	UbSPsFW
Merlin	<i>Falco columbarius</i>	UBSPSFw

Grouse and Ptarmigan

Ruffed Grouse	<i>Bonasa umbellus</i>	CBRI
Spruce Grouse	<i>Falciennis canadensis</i>	UBRI
Willow Ptarmigan	<i>Lagopus lagopus</i>	CBR

Coots

American Coot	<i>Fulica americana</i>	U*spsFw
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Cranes

Sandhill Crane	<i>Grus canadensis</i>	XVSPSF
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Plovers

Black-bellied Plover	<i>Pluvialis squatarola</i>	CspSF
Semipalmated Plover	<i>Charadrius semipalmatus</i>	CbspSF
Piping Plover	<i>Charadrius melodus</i>	U*BSPS
Killdeer	<i>Charadrius vociferus</i>	U*BSPSFw

Sandpipers and Phalaropes

Greater Yellowlegs	<i>Tringa melanoleuca</i>	CBSPSFw
Lesser Yellowlegs	<i>Tringa flavipes</i>	UspSf
Spotted Sandpiper	<i>Actitis macularia</i>	CBSPSF
Solitary Sandpiper	<i>Tringa solitaria</i>	XspSf
Wilson's Phalarope	<i>Phalaropus tricolor</i>	XSPSF
Short-billed Dowitcher	<i>Limnodromus griseus</i>	UspSf
Common Snipe	<i>Gallinago gallinago</i>	CBSPSFw
Ruddy Turnstone	<i>Arenaria interpres</i>	CspSFw
Red Knot	<i>Calidris canutus</i>	UspSfw
Least Sandpiper	<i>Calidris minutilla</i>	CBSPSF
Dunlin	<i>Calidris alpina</i>	UspSF
Sanderling	<i>Calidris alba</i>	CspSFw

Pectoral Sandpiper	<i>Calidris melanotos</i>	UspSF
White-rumped Sandpiper	<i>Calidris fuscicollis</i>	CspSFw
Semipalmated Sandpiper	<i>Calidris pusilla</i>	CspSF
Willet	<i>Catoptrophorus semipalmatus</i>	XbSPSf
Whimbrel	<i>Numenius phaeopus</i>	Usf
Black-tailed Godwit	<i>Limosa limosa</i>	XVSPW
Bar-tailed Godwit	<i>Limosa lapponica</i>	X*VF

Gulls and Terns

Ivory Gull	<i>Pagophila eburnea</i>	UspfW
Great Black-backed Gull	<i>Larus marinus</i>	CBR
Herring Gull	<i>Larus argentatus</i>	CBR
Ring-billed Gull	<i>Larus delawarensis</i>	CBSPSFw
Laughing Gull	<i>Larus atricilla</i>	XVSPSF
Black-headed Gull	<i>Larus ridibundus</i>	UbSPsFW
Bonaparte's Gull	<i>Larus philadelphia</i>	XspSfw
Black-legged Kittiwake	<i>Rissa tridactyla</i>	CBR
Common Tern	<i>Sterna hirundo</i>	CBSPSf
Caspian Tern	<i>Sterna caspia</i>	UBSPSf

Auks

Common Murre	<i>Uria aalge</i>	CBR
Dovekie	<i>Alle alle</i>	CspsFW
Black Guillemot	<i>Cepphus grylle</i>	CBR

Doves

Mourning Dove	<i>Zenaida macroura</i>	UspSfw
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Owls

Snowy owl	<i>Nyctea scandiaca</i>	UESPsFW
Short-eared Owl	<i>Asio flammeus</i>	UBSPSFw

Kingfishers

Belted Kingfisher	<i>Ceryle alcyon</i>	CBSPSfw
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Woodpeckers

Downy Woodpecker	<i>Picoides pubescens</i>	CBR
Hairy Woodpecker	<i>Picoides villosus</i>	CBR
Northern Flicker	<i>Colaptes auratus</i>	CBSPSFw

Tyrant Flycatchers

Olive-sided Flycatcher	<i>Contopus cooperi</i>	UBSPS
Alder Flycatcher	<i>Empidonax alnorum</i>	UBSPSf

Shrikes

Northern Shrike	<i>Lanius excubitor</i>	U*ESPsFW
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Vireos

Blue-headed Vireo	<i>Vireo solitarius</i>	U*BSPSF
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Jays and Crows

Blue Jay	<i>Cyanocitta cristata</i>	UBR
Gray Jay	<i>Perisoreus canadensis</i>	CBR
Common Raven	<i>Corvus corax</i>	CBR
American Crow	<i>Corvus brachyrhynchos</i>	CBR

Larks

Horned Lark	<i>Eremophila alpestris</i>	CBSPSFw
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Swallows

Bank Swallow	<i>Riparia riparia</i>	UBSPSF
Tree Swallow	<i>Tachycineta bicolor</i>	CBSPSFw

Chickadees

Black-capped Chickadee	<i>Poecile atricapilla</i>	CBR
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Nuthatches

Red-breasted Nuthatch	<i>Sitta canadensis</i>	UBR
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Thrushes

American Robin	<i>Turdus migratorius</i>	CBSPSFw
Hermit Thrush	<i>Catharus guttatus</i>	CBSPSFw
Veery	<i>Catharus fuscescens</i>	UBSPS

Mockingbirds

Northern Mockingbird	<i>Mimus polyglottos</i>	U*bR
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Starlings

European Starling	<i>Sturnus vulgaris</i>	CBR
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Warblers

Nashville Warbler	<i>Vermivora ruficapilla</i>	XbSPSF
Yellow Warbler	<i>Dendroica petechia</i>	CBSPSF
Yellow-throated Warbler	<i>Dendroica dominica</i>	XVsFw
Yellow-rumped Warbler	<i>Dendroica coronata</i>	CBSPSFw
Blackpoll Warbler	<i>Dendroica striata</i>	CBSPSFw
Magnolia Warbler	<i>Dendroica magnolia</i>	CBSPSF
Prairie Warbler	<i>Dendroica discolor</i>	XVSFw
American Redstart	<i>Setophaga ruticilla</i>	CBSPSF
Northern Waterthrush	<i>Seiurus noveboracensis</i>	CBSPSF

Sparrows

American Tree Sparrow	<i>Spizella arborea</i>	UBSPSFw
Chipping Sparrow	<i>Spizella passerina</i>	U*BSPSFw
Fox Sparrow	<i>Passerella iliaca</i>	CBSPSFw
Savannah Sparrow	<i>Passerculus sandwichensis</i>	CBSPSFw
Song Sparrow	<i>Melospiza melodia</i>	UBSPSFw
White-throated Sparrow	<i>Zonotrichia albicollis</i>	CBSPSFw
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	UBSPSFw
Snow Bunting	<i>Plectrophenax nivalis</i>	CSPsFW
Dark-eyed Junco	<i>Junco hyemalis</i>	CBR
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	CBSPSFw

Cardinals

Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	U*BSPSFw
Indigo Bunting	<i>Passerina cyanea</i>	XVSPsF

Blackbirds

Red-winged Blackbird	<i>Agelaius phoeniceus</i>	U*BSPSFw
Rusty Blackbird	<i>Euphagus carolinus</i>	CBSPSFw
Common Grackle	<i>Quiscalus quiscula</i>	UbSPSFw
Brown-headed Cowbird	<i>Molothrus ater</i>	U*bSPSFw

Finches

Evening Grosbeak	<i>Coccothraustes vespertinus</i>	UEbSPsFW
Pine Grosbeak	<i>Pinicola enucleator</i>	CBR
Purple Finch	<i>Carpodacus purpureus</i>	CBR
Common Redpoll	<i>Carduelis flammea</i>	CEBR
Pine Siskin	<i>Carduelis pinus</i>	CEBR
American Goldfinch	<i>Carduelis tristis</i>	UBSPSFw
White-winged Crossbill	<i>Loxia leucoptera</i>	CEBR
Red Crossbill	<i>Loxia curvirostra</i>	U*BR

Old World Sparrows

House Sparrow	<i>Passer domesticus</i>	UBR
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* the occurrence designations are taken from the *Checklist (1999) of the Birds of Insular Newfoundland and its Continental Shelf Waters*, published by The Natural History Society of Newfoundland and Labrador, Inc.

Occurrence (based on an experienced observer birding regularly and widely)

C = common	likely to be found daily in appropriate season/habitat
U = uncommon	likely to be found monthly in appropriate season/habitat; may be locally common
U* = very uncommon	likely to be found annually in appropriate season/habitat; may be locally uncommon
X = rare	not likely to be found annually; though apparently occurs regularly in very small numbers
X* = very rare	recorded three times or less

Status

B = breeder	known to breed ("b" if nesting abundance is significantly lower than indicated by occurrence designation)
R = resident	non-migratory, or maintains a significant year-round population
E = irruptive	irruptive species, much more abundant in some years than in others
V = vagrant	occurrence is outside usual range
I = introduced	introduced to Newfoundland

Seasonal Dates (seasons during which a species has been recorded - a lower case entry indicates that a species is less common during that season than indicated by the overall occurrence designation)

SP = spring	21 March - 20 June
S = summer	21 June - 20 September
F = fall	21 September - 20 December
W = winter	21 December - 20 March

APPENDIX 4: Vegetation Species Inventory

<u>Common Name</u>	<u>Scientific Name</u>
balsam fir	<i>Abies balsamea</i>
mountain maple	<i>Acer spicatum</i>
rough bentgrass	<i>Agrostis scabra</i>
creeping bentgrass	<i>Agrostis stolonifera</i>
speckled alder	<i>Alnus incana</i>
chuckley pear	<i>Amelanchier spicata</i>
beachgrass	<i>Ammophila breviligulata</i>
pearly everlasting	<i>Anaphalis margaritacea</i>
thimbleweed; riverbank anemone (S1)	<i>Anemone virginiana</i> var. <i>alba</i>
angelica; purplestem; alexanders	<i>Angelica atropurpurea</i>
sweet vernalgrass	<i>Anthoxanthum odoratum</i>
Indian hemp (S2)	<i>Apocynum cannabinum</i>
white birch	<i>Betula papyrifera</i>
northern shorthusk	<i>Brachyelytrum erectum</i>
fringed brome	<i>Bromus ciliatus</i>
bluejoint; Canada reedgrass	<i>Calamagrostis canadensis</i>
wild calla (S1S2)	<i>Calla palustris</i>
marsh-marigold; cowslip	<i>Caltha palustris</i>
harebell	<i>Campanula rotundifolia</i>
silvery sedge; hoary sedge	<i>Carex canescens</i>
lesser paniced sedge	<i>Carex diandra</i>
yellow sedge	<i>Carex flava</i>
graceful sedge	<i>Carex gracillima</i>
lake sedge	<i>Carex lacustris</i>
woollyfruit sedge; slender sedge	<i>Carex lasiocarpa</i>
beaked sedge	<i>Carex rostrata</i>
seabeach sedge (S1S2)	<i>Carex silicea</i>
creeping snowberry	<i>Chiogenes hispidula</i>
bunchberry; crackerberry	<i>Cornus canadensis</i>
red osier dogwood	<i>Cornus stolonifera</i>
beaked hazelnut	<i>Corylus cornuta</i>
poverty oatgrass	<i>Danthonia spicata</i>
water horsetail	<i>Equisetum fluviatile</i>
marsh horsetail	<i>Equisetum palustre</i>
spotted Joe-Pye weed	<i>Eupatorium maculatum</i>
hair fescue	<i>Festuca capillata</i>
Richardson's fescue	<i>Festuca rubra</i>
boreal bedstraw (S2S3)	<i>Galium kamtschaticum</i>
marsh bedstraw	<i>Galium palustre</i>
water avens; purple avens	<i>Geum rivale</i>

sea milkwort	<i>Glaux maritima</i>
sweetgrass; vanilla grass	<i>Hierochloe odorata</i>
foxtail barley (S1S2)	<i>Hordeum jubatum</i>
blue flag iris	<i>Iris versicolor</i>
jointed rush	<i>Juncus articulatus</i>
Baltic rush	<i>Juncus balticus</i>
narrow paniced rush	<i>Juncus brevicaudatus</i>
Canadian rush	<i>Juncus canadensis</i>
saltmarsh rush; black grass	<i>Juncus gerardii</i>
creeping rush (S2)	<i>Juncus subtilis</i>
fall dandelion	<i>Leontodon autumnalis</i>
sea lavender (S2)	<i>Limonium carolinianum</i>
common woodrush	<i>Luzula multiflora</i>
blue groundcedar	<i>Lycopodium tristachyum</i>
northern bugleweed	<i>Lycopus uniflorus</i>
swamp candles	<i>Lysimachia terrestris</i>
wild mint	<i>Mentha arvensis</i>
buckbean; bogbean	<i>Menyanthes trifoliata</i>
bluntleaf sandwort; grove sandwort	<i>Moehringia lateriflora</i>
sweet gale	<i>Myrica gale</i>
sea plantain	<i>Plantago maritima</i>
large purple-fringed orchis (S2S3)	<i>Platanthera grandiflora</i>
Kentucky bluegrass	<i>Poa pratensis</i>
pondshore knotweed (S2)	<i>Polygonum raii</i>
silverweed	<i>Potentilla anserina</i>
shrubby cinquefoil	<i>Potentilla fruticosa</i>
marsh cinquefoil	<i>Potentilla palustris</i>
selfheal, healall	<i>Prunella vulgaris</i>
Alberton alkali grass (S1S2)	<i>Puccinella ambigua</i>
choke cherry	<i>Prunus virginiana</i>
hooked crowfoot (S1)	<i>Ranunculus recurvatus</i>
creeping spearwort	<i>Ranunculus reptans</i>
yellowrattle	<i>Rhinanthus borealis</i>
dwarf raspberry; dewberry	<i>Rubus pubescens</i>
broadleaf arrowhead; wapato (S1S2)	<i>Sagittaria latifolia</i>
shining willow	<i>Salix lucida</i>
cottony willow; stiff willow	<i>Salix rigida</i>
Canada burnet; bottlebrush	<i>Sanguisorba Canadensis</i>
black snakeroot; black sanicle	<i>Sanicula marilandica</i>
threesquare (S2)	<i>Schoenoplectus pungens</i>
hardstem bulrush	<i>Scirpus acutus</i>
softstem bulrush	<i>Scirpus validus</i>
Canada goldenrod	<i>Solidago canadensis</i>
rough stemmed goldenrod	<i>Solidago rugosa</i>
seaside goldenrod (S2S3)	<i>Solidago sempervirens</i>
saltwater cordgrass (S2)	<i>Spartina alterniflora</i>

saltmeadow cordgrass (S1S2)
slender wedge grass (S1S2)
marsh hedgenettle
sago pondweed (S2)
common dandelion
tall meadow rue
Gaspé arrowgrass
seaside arrowgrass
purple false oats (S1S2)
lowbush blueberry
squashberry; mooseberry
large-leaved violet
horned pondweed (S2)
eelgrass; seawrack

Spartina patens
Sphenopholis intermedia
Stachys palustris
Stuckenia pectinata
Taraxacum officinale
Thalictrum pubescens
Triglochin gaspensis
Triglochin maritima
Trisetum melicoides
Vaccinium angustifolium
Viburnum edule
Viola blanda
Zannichellia palustris
Zostera marina

APPENDIX 5: Community-Based Waterfowl Monitoring Project Protocols and Data Sheet

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 (i.e., 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.

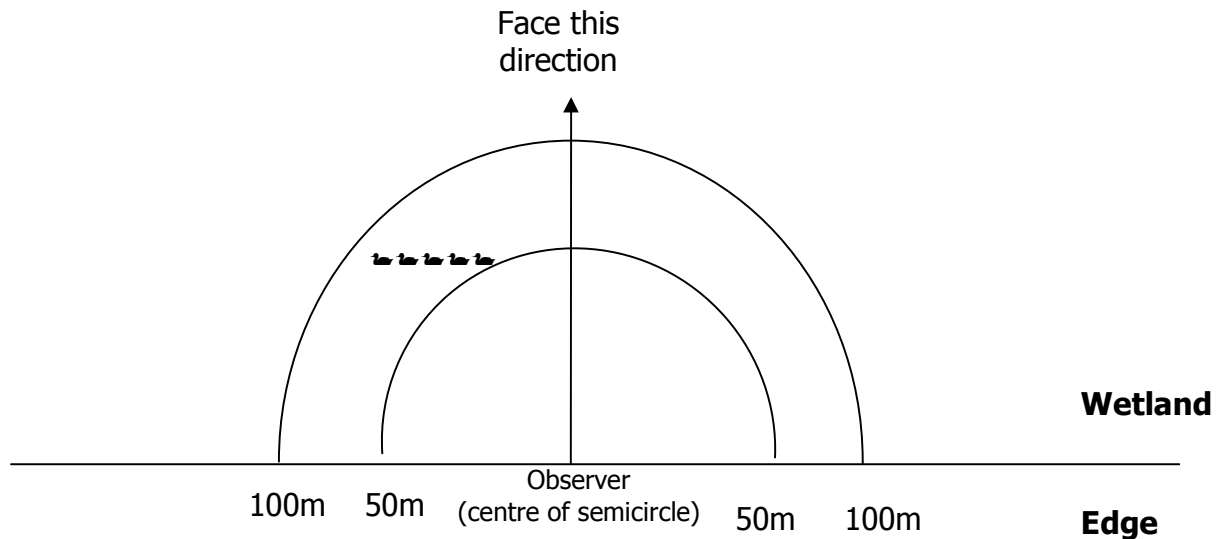
Survey Locations

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 10 minute 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 (e.g., a 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 Wildlife Division 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

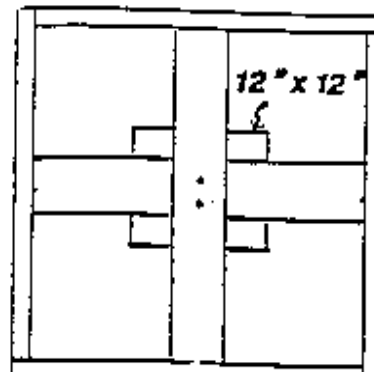
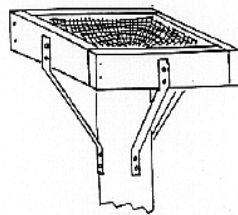
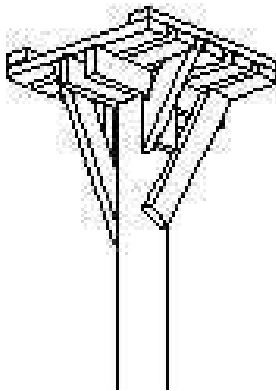
APPENDIX 6: Potential Artificial Osprey Platform

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):

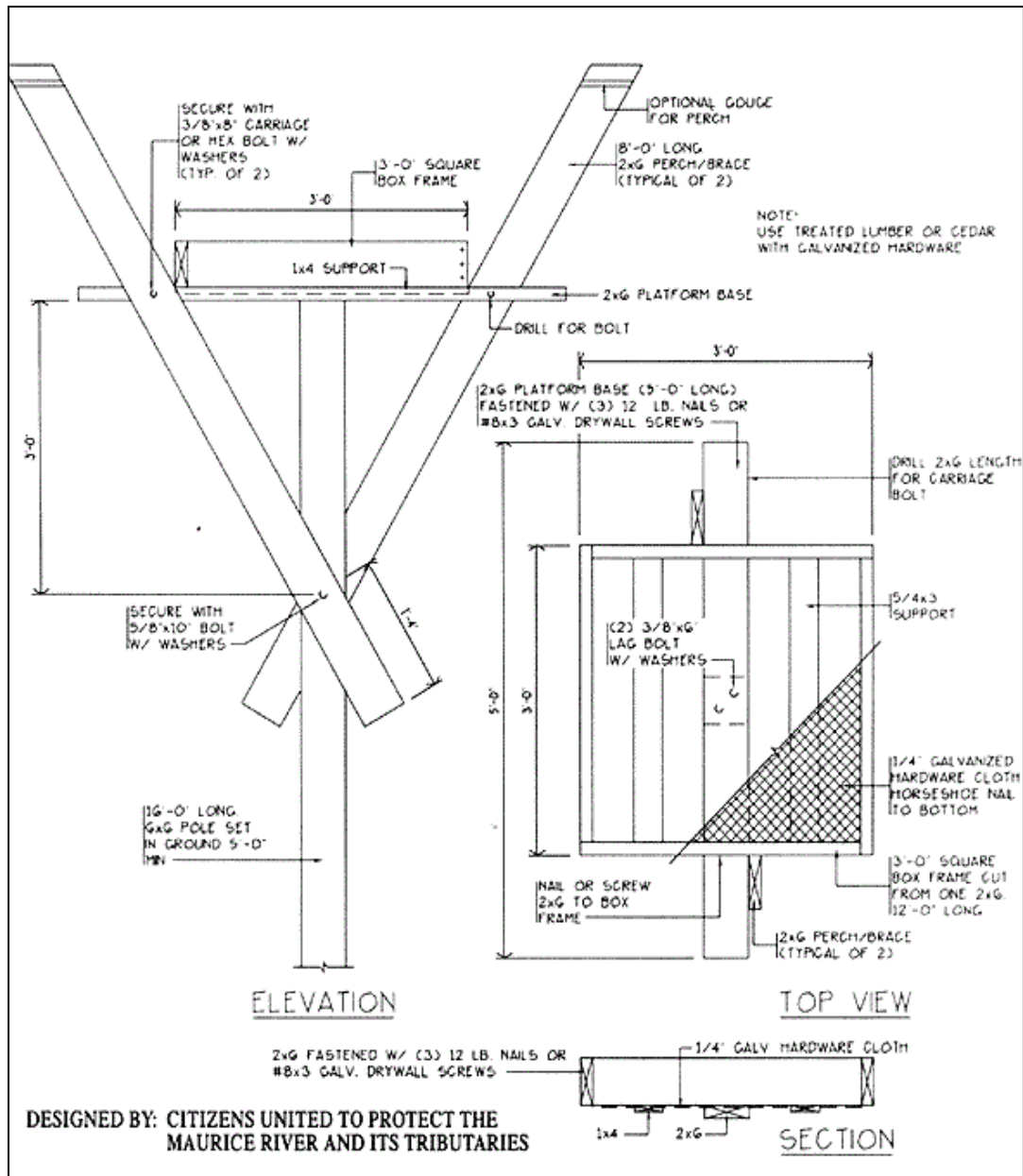


1) Platform View

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 filled with rock and can weigh up to several tones:



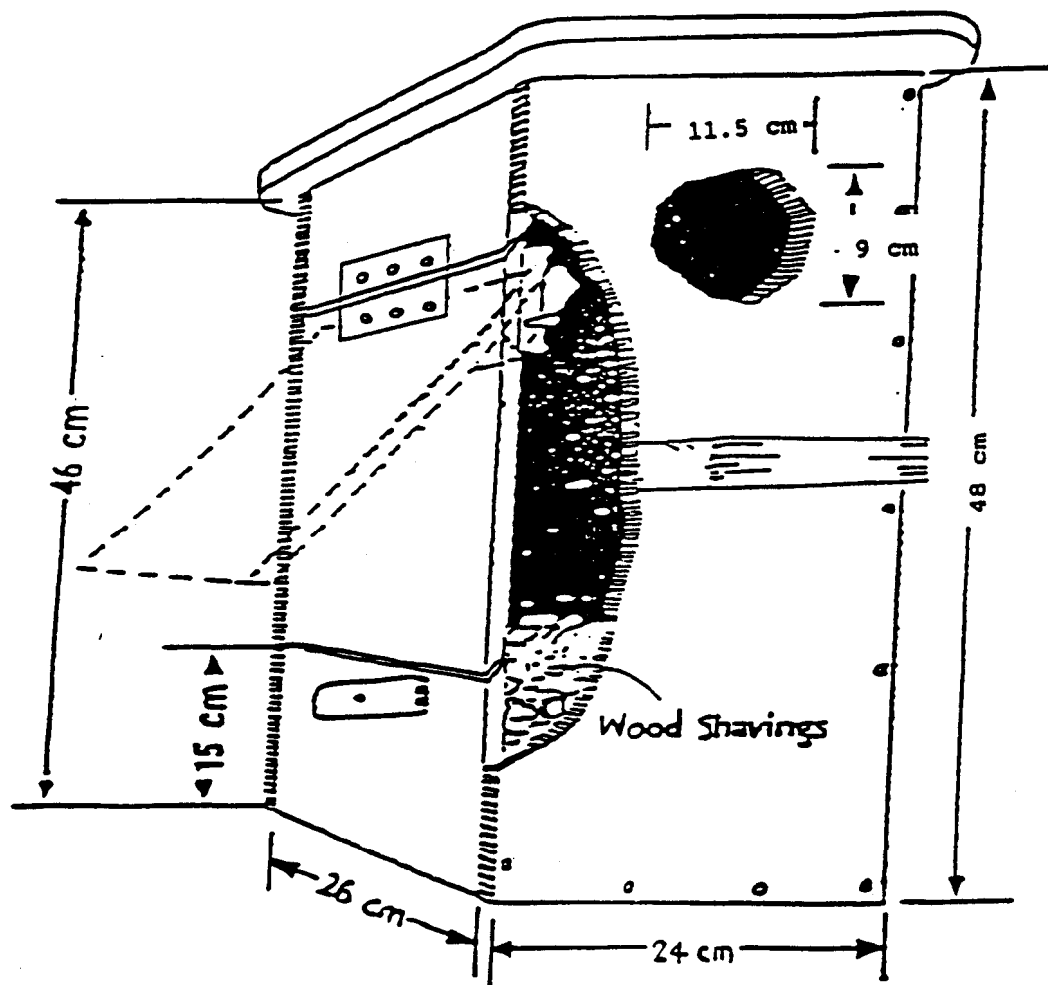
Photo Courtesy of "Pine Creek Watershed"

- 6) 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 the Cavity Nest Boxes**



APPENDIX 9:
Appropriate Wording Required for a Potential “No-Shooting” Sign



**NO
SHOOTING**

**THE DISCHARGE OF A FIREARM
WITHIN 1,000 METRES OF A SCHOOL,
PLAYGROUND OR ATHLETIC FIELD,
OR WITHIN 300 METRES OF A DWELLING
IS NOT PERMITTED.**

**NEWFOUNDLAND AND LABRADOR WILD LIFE ACT
WILD LIFE REGULATION 111 (1)**

APPENDIX 10: Bird-Watching (Viewing) Towers

Bird-watching (Viewing) Towers overlooking estuary in Carleton, Quebec built in 1990 for \$50,000 by local construction companies:



Photographer Unknown



Photographer Unknown

APPENDIX 11: Construction of Bird Blinds

Image of inside and outside of bird blind in Grand Falls-Windsor:



Photo Courtesy of Corduroy Brook Trail Association.



Photo Courtesy of Corduroy Brook Trail Association.

APPENDIX 12: Construction of a Viewing Deck

Image of viewing deck with interpretive panel in Glovertown:



Photo by Wildlife Division Staff.

APPENDIX 13: Interpretation Centers and Other Structures

The Wetland Interpretation Centre in the Grand Codroy Valley during the 1st annual Feather and Folk nature festival. *Photo by Charmaine Barney.*



View from the Wetland Interpretation Centre rear deck. *Photo by Charmaine Barney.*



Ecomuseum Shelter and Amphitheatre in Winterland. *Photo by Wildlife Division Staff.*



The Fluvarium in St. John's.

