

Habitat Conservation Plan

for the Town of Portugal Cove – St. Philip’s,
Newfoundland and Labrador, Canada



March 2014, revised June 2017



NL Eastern Habitat Joint Venture (EHJV)

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Preface

In the province of Newfoundland and Labrador, some of the wildlife habitats 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 (EHJV) is to conserve valuable wildlife habitat through Stewardship Agreements. The Town of Portugal Cove - St. Philip's was identified as having just such ecologically valuable, and unique, wetland habitat located within its Municipal Planning Area boundaries.

The Town of Portugal Cove - St. Philip's signed a stewardship agreement on June 19th 2015, pledging their commitment to conservation and protection of habitat within designated areas known as Management Units (**Appendix 1**). In accordance with this agreement, the town manages these wetland areas with technical advice provided by the provincial Wildlife Division, in part via this Habitat Conservation Plan which the parties have agreed will guide activities within Management Units.

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Section 1: Plan Overview

Stewardship Agreement Goals

1. To conserve wetlands located within the designated Management Units
2. To maintain and/or increase wildlife use of those areas, particularly by waterfowl and other avian species
3. To increase public awareness of the importance of wetland habitats for conserving waterfowl and other wildlife

Plan Purpose & Objectives

The Town of Portugal Cove – St. Philip’s will use this Habitat Conservation Plan as a guide to govern activities which impact wildlife habitat in order to minimize negative impacts within the areas designated for conservation.

The plan presents a general assessment of the wildlife habitat designated for conservation and recommends protection, conservation, and enhancement strategies, best practices for enhancing and/or managing your wildlife habitat. It also describes potential initiatives for education and awareness among the public in order to increase support and cooperation of the Town’s citizens.

Relevant sections of the Habitat Conservation Plan (especially appropriate zoning of the Management Units) will be incorporated into the town’s existing or future municipal plan, operating plan or master plan for use during future development decisions.

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 one of the most sensitive ecosystems. 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 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 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. Some 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 impacted by human development. Canada, the United States and Mexico have signed the North American Waterfowl Management Plan (NAWMP, nawmp.wetlandnetwork.ca) and committed to a long-term program aimed at assuring the survival and increase of waterfowl populations and protecting their habitats. 24 joint ventures, ranging from species to regional-specificity, have been established to achieve and implement the objectives of NAWMP. The province of Newfoundland and Labrador, through the provincial Wildlife Division, became a partner of the Eastern Habitat Joint Venture (EHJV, ehjv.ca) in 1989.

Eastern Habitat Joint Venture (EHJV)

The goal of the EHJV (ehjv.ca) is to conserve, enhance and restore habitat for birds, especially wetlands, in the six eastern Canadian provinces of 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. Its other local contributors are Ducks Unlimited Canada, Canadian Wildlife Service (a part of Environment and Climate Change Canada), 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 Municipal Habitat Stewardship

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 within municipalities are often at the greatest risk of destruction or alteration and 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 principal goal is to help make municipalities, corporations, developers, landowners, and other wetland habitat stakeholders more aware of the value of habitat within their jurisdiction and to empower them to take action to conserve these areas. This leads to more informed development decision-making and works towards minimizing negative impacts on local ecosystems. This component of the program focuses largely upon signing Stewardship Agreements with municipalities, corporations and individual landowners who own or manage significant wetland habitat.

If mutual interest exists between a municipality and the Wildlife Division/SAM, and surveys demonstrate important habitat within municipal planning area boundaries, a proposal featuring suggested Management Units is prepared and presented for review. Management Units are significant habitat areas which are 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. After the Management Units have been agreed upon by all parties, the formal Habitat Stewardship Agreement is signed between the presiding body (town, corporation, or landowner) and the province which represents a public commitment to preserve these habitat areas.

By signing a Stewardship Agreement, communities, corporations and individuals become an important link in a continental chain of conservation areas. To date nearly 40 municipalities have signed Habitat Stewardship Agreements, and Corporate Stewardship Agreements have been signed by the Iron Ore Company of Canada and Corner Brook Pulp and Paper Limited. Private landowners in several of the communities surrounding the Grand Codroy Estuary (an estuary of international significance) as well as Burgeo have also been involved with the signing of Landowner *Good Steward* Agreements, demonstrating individual commitment to local habitat (Figure 1).

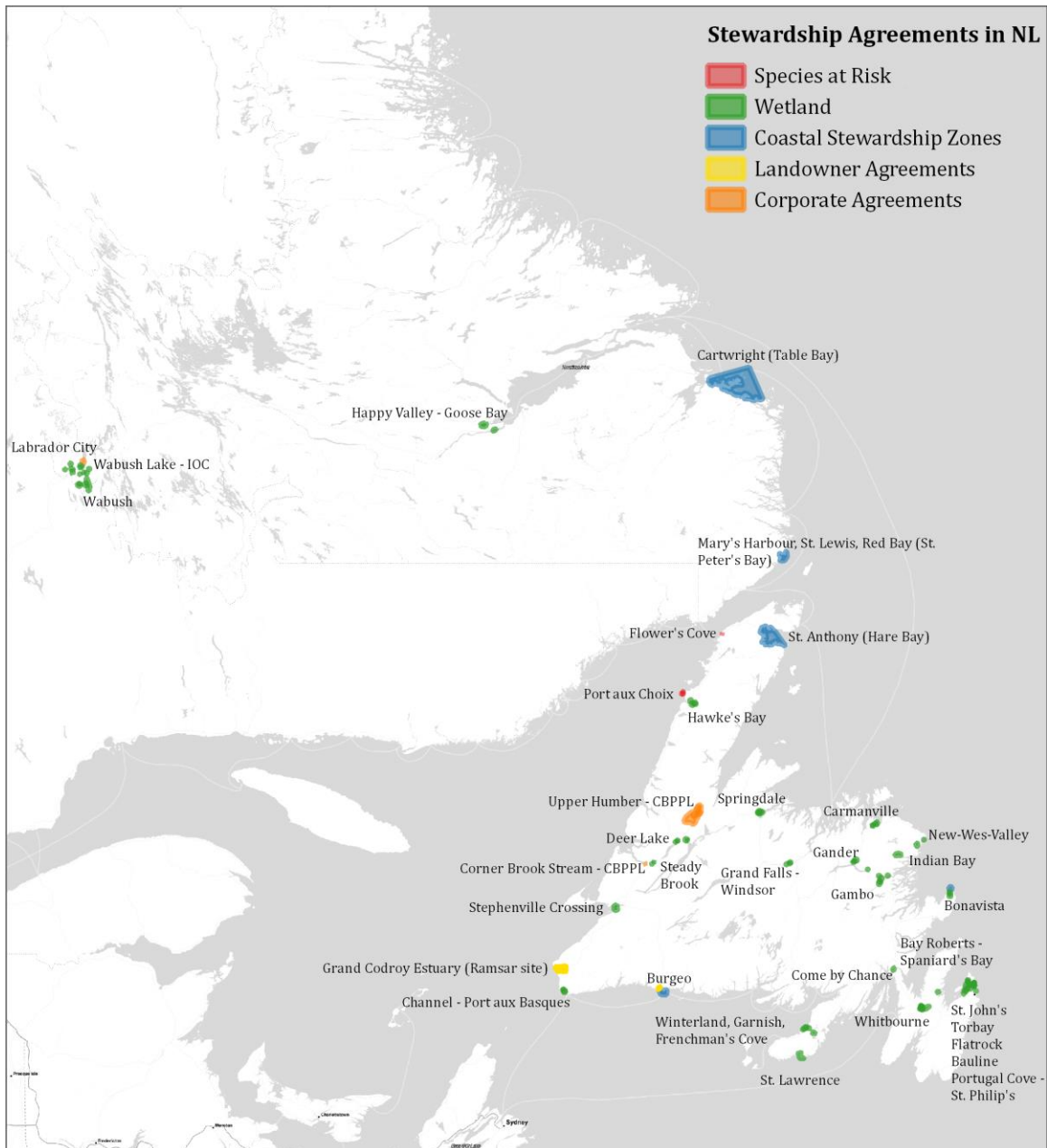


Figure 1: Map of stewardship agreements signed in the province of NL.

Stewardship Association of Municipalities (SAM)

When PCSP signed their Municipal Habitat Stewardship Agreement (**Appendix 1**) with the province, it became a member of the Stewardship Association of Municipalities Inc. (SAM, samnl.org). SAM is an incorporated, non-profit organization whose member municipalities secure, enhance and restore important wildlife habitat in the province while balancing municipal development with conservation. SAM maintains a public page about your agreement at samnl.org/portugal-cove---st-philips featuring maps, photos, facts, and information on local attractions. Please link to this page from your town's website; this will help increase residents' knowledge and understanding of the agreement and program.

SAM represents its members on issues of common concern related to provincial wildlife habitat conservation. As part of the implementation of their individual Municipal Plans, Stewardship Agreements and associated Habitat Conservation Plans, member municipalities educate and engage residents, particularly youth, in environmental stewardship and conservation. This is in recognition that the involvement and support of local people can and has had a significant positive impact on a wide variety of conservation issues.

SAM meets each spring (May or June) and fall (September or October) with host municipalities rotating among members. We encourage you to identify a representative to attend at least one of these meetings per year. This will serve as a significant connection for your town to like-minded municipalities and link you to resources and training.

Roles of Stewardship Agreement Signatories

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. Therefore, each party to the agreement (**Appendix 1**) has specific roles to play.

The Province - The Minister of Environment and Conservation (as the department was known at that time; our program now falls under the Department of Fisheries and Land Resources) was the designated signatory on behalf of the province for your agreement. The Wildlife Division administers the Eastern Habitat Joint Venture in Newfoundland and Labrador and works closely with the Stewardship Association of Municipalities (SAM) on its implementation.

Now that the Stewardship Agreement has been signed, staff of the Wildlife Division and/or SAM are expected to:

- Provide the agreement signatory with technical advice and assist in the development of a Habitat Conservation Plan (this plan)
- Review proposed developments within the Management Units that have the potential to impact that wildlife habitat (page 11)
- Assist in carrying out, where appropriate, education and information initiatives to raise awareness of wildlife, wetland and coastal related issues (such as those discussed in Section 5), and
- Support community conservation groups in implementing the Stewardship Agreement and Habitat Conservation Plan.

Now that the Stewardship Agreement has been signed, the Town of Portugal Cove - St. Philip's (PCSP) and its designated Mayor and Council are expected to:

- Ensure that significant wildlife habitat areas designated as Management Units are protected from destruction or degradation. Contact the Wildlife Division in a timely manner when activities are proposed that may impact that habitat (see page 11)
- Incorporate the Stewardship Agreement and Habitat Conservation Plan into its next Municipal Plan draft or revision (see page 11)
- 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 SAM (see page 8)

Section 3: General Policies for Habitat Conservation

The Town's Commitment to Stewardship

In signing a Municipal Habitat Stewardship Agreement, the Town of Portugal Cove - St. Philip's has made a public commitment to join an international network of important wetland habitat areas contributing to the presence and abundance of birds and other wildlife in North America. Further, the Town of PCSP 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 Units. Perhaps most significantly, it is hoped that a stewardship ethic will be fostered within the community since the conservation of wildlife habitat depends not wholly on Habitat Conservation Plans or regulations, but on the conservation and stewardship ethic of Town residents and of visitors.

Benefits for Residents

The strategies outlined in this Habitat Conservation Plan can provide many long-term recreational and quality-of-life benefits for 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; the use of interpretive signs (Figure 2) can help both residents and tourists connect with the area. 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.

One 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.

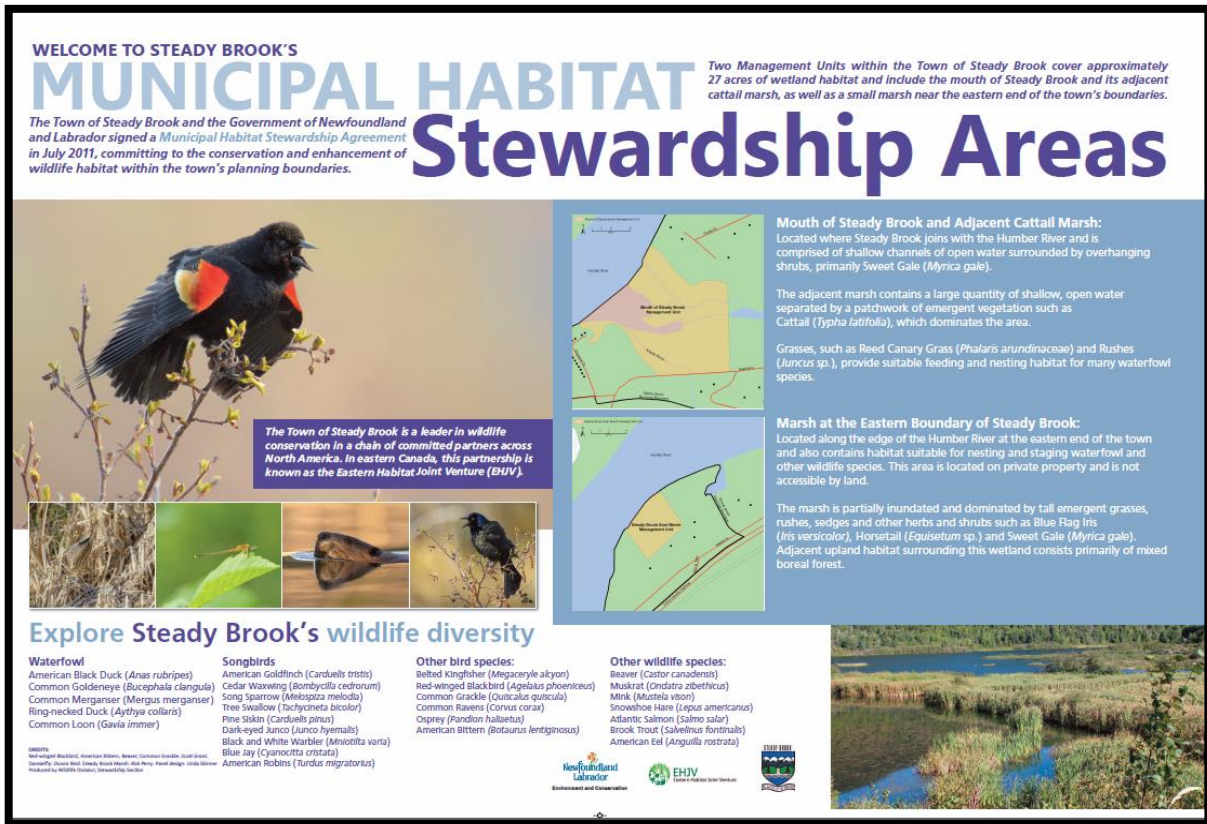


Figure 2: Example of a SAM EHJV interpretive sign
 This interpretive sign measures 2 by 3 feet and can be provided to member municipalities as time and funding allow.

Activities in Management Units

Permitted activities do not result in the loss of wildlife habitat or wildlife populations. Efforts may also be made to reduce pre-existing habitat degradation within Management Units. Only activities that have no negative or adverse impact upon wetland and associated upland habitat, and on the associated wildlife using those habitats, are permitted in these areas. Development proposals which impact habitat or wildlife within the Management Units should be forwarded to EHJV Program Manager at the provincial Wildlife Division for comment with a thirty (30) day notice period.

The existence of cabins in the Blast Hole Ponds Management Unit is of concern. Approximately 10-12 cabins can be viewed on earlier maps, but precisely how many cabins may exist, or what state they are in, is not known. We recommend that staff assigned to the stewardship agreement work closely with the PCSP municipal Development Control Officer to understand the number of cabins and any current trends. These cabins are of concern as they are in areas which are not zoned as

cabin areas, not residential, and inside a Management Unit. Cabins can promote trail building and off-road vehicle use which then further affect habitat conservation. Cabin developments inside MUs compromise habitat and run contrary to the Stewardship Agreement.

Incorporating Management Units in the Municipal Plan

During the preparation of any draft Municipal Plan, or during Municipal Plan Review, the Town Council shall incorporate the Stewardship Agreement into any resulting Municipal Plan or related Master Plan. Specifically, the Management Units, and any future Management Units as may be desirable, shall be zoned Environmental Conservation, Environmental Protection, Open Space Conservation, Recreational Open Space, or some similar consistent designation, within municipal planning documents as governed by the Urban and Rural Planning Act (2000).

In approving permits, regulations or by-laws related to the area's designation within a Municipal Plan, or any amendments to a future Municipal Plan which could affect the Management Units, the Town Council will consult with the EHJV Program Manager at the provincial Wildlife Division.

Riparian Buffers in the Management Units

Riparian buffers are 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 wildlife when leaves, insects, and larvae drop into the water body off surrounding trees and shrubs. The province, via the provincial Lands Act – Section 7(1), requires a crown land reserve or easement of up to 15 meters along all water bodies greater than 1 metre in width and the maintenance of permanent riparian areas next to watercourses within the province. It is important that the Town helps to ensure awareness and adherence to this crown land reserve designation by all of its residents and businesses. The vegetated (untouched) buffer exists as the minimum protection around all waterbodies and marsh areas and is critical within the

designated Management Units. Agriculture and cabin development are two of the most common and most likely disturbances to riparian habitat.

Restoration projects can rebuild riparian areas; **Appendix 5** provides suggestions for possible plant species to be used, and Section 5 contains contact information for professionals in PCSP with experience in environmental restoration.

Management by Committee

Municipalities usually maintain and implement their Stewardship Agreement and its associated Habitat Conservation Plan via a formal committee of council. The Portugal Cove – St. Philip’s *Advisory Committee on the Environment* (ACE) is currently active and could be involved in carrying out conservation initiatives, such as those outlined in this plan.

It has been our experience that dedicated committees often have greater success in raising the profile of the environment and the protected areas within the larger community which increases public understanding and support over the long-term. Many of these types of groups have found benefits in reserving spots in the group for a younger person, a high school student, or both. By involving locals, a greater sense of ownership is fostered which can strengthen conservation commitments. These committees can organize events, apply for grants, conduct cleanups and other projects, host hikes and walks, and many other activities including those described in Section 5.

Section 4: Wildlife Habitat within the Town of Portugal Cove – St. Philip’s

Assessments of wildlife habitat within the planning boundaries of Portugal Cove – St. Philip’s were conducted in the summer 2012 by Wildlife Division staff. Wetlands and other habitat types within the municipality were noted to provide areas of important habitat for various species of birds and other wildlife (**Appendix 2**). Following discussion and feedback with council and staff, as well as input from members of the public, the following areas were selected. These five Management Units (Figures 3-11) in Portugal Cove – St. Philip’s encompass a substantial land area (8.5 km², 853 hectares, or 2107 acres).

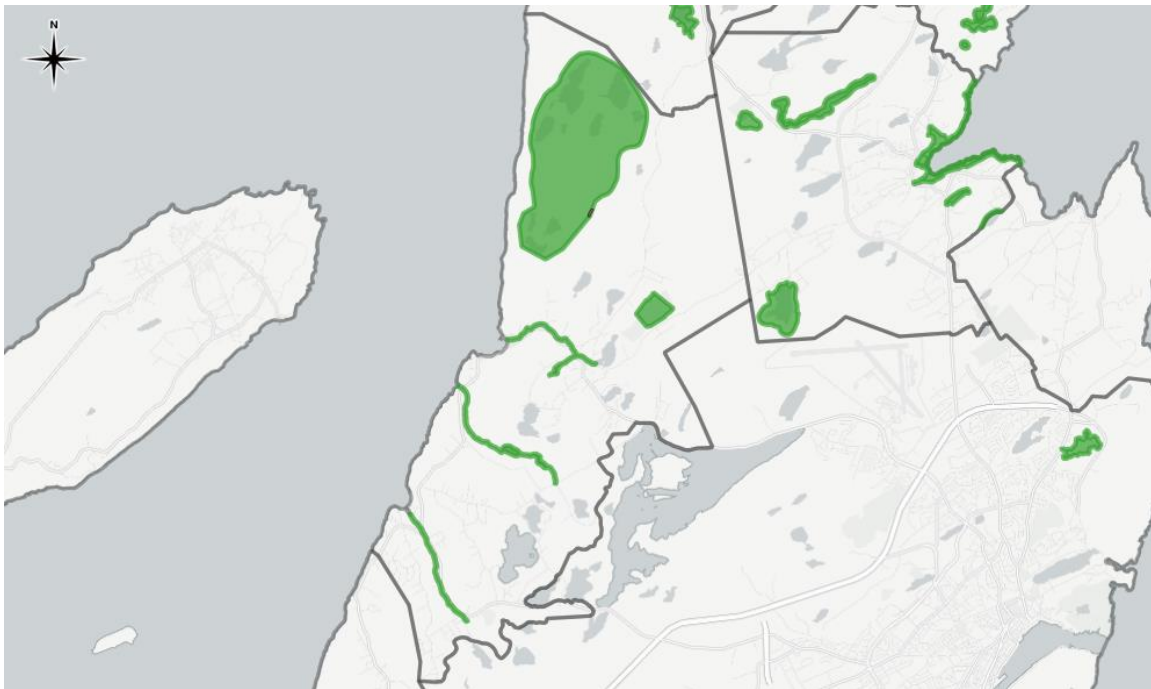


Figure 3: Overview of Management Units in PCSP

Management Units shown in green; dark grey borders represent Municipal Planning areas. Other Management Units in the Town of Bauline, Town of Flatrock, Town of Torbay, and City of St. John’s are also visible on the map.

Voisey’s Brook

This Management Unit (Figures 4, 5, 6) is located off Indian Meal Line, northeast of Millers Pond and spans approximately 42 hectares. The Town received a grant from the provincial Department of Environment and Conservation (as it was known at that time) to develop an extension to the Voisey’s Brook Park, which will include a four season nature trail, picnic areas, as well as a wetland interpretation boardwalk.

The Wildlife Division also supported the park's creation via a letter of support to the Crown Lands Division. It is believed that the expansion of the park, in the form of community conservation and education, adds to the importance of the wildlife habitat found in the area. The area was recommended to be included as a Management Unit by the Town and the Heritage Committee as its long-term purpose is complementary to the goals of the Municipal Stewardship Program. The management unit includes only the area of expansion, not the remainder of the existing park, which is a widely used recreational area.



Figure 4: Voisey's Brook Management Unit
Photo by NL Wildlife Division



Figure 5: Aerial photo of Voisey's Brook area

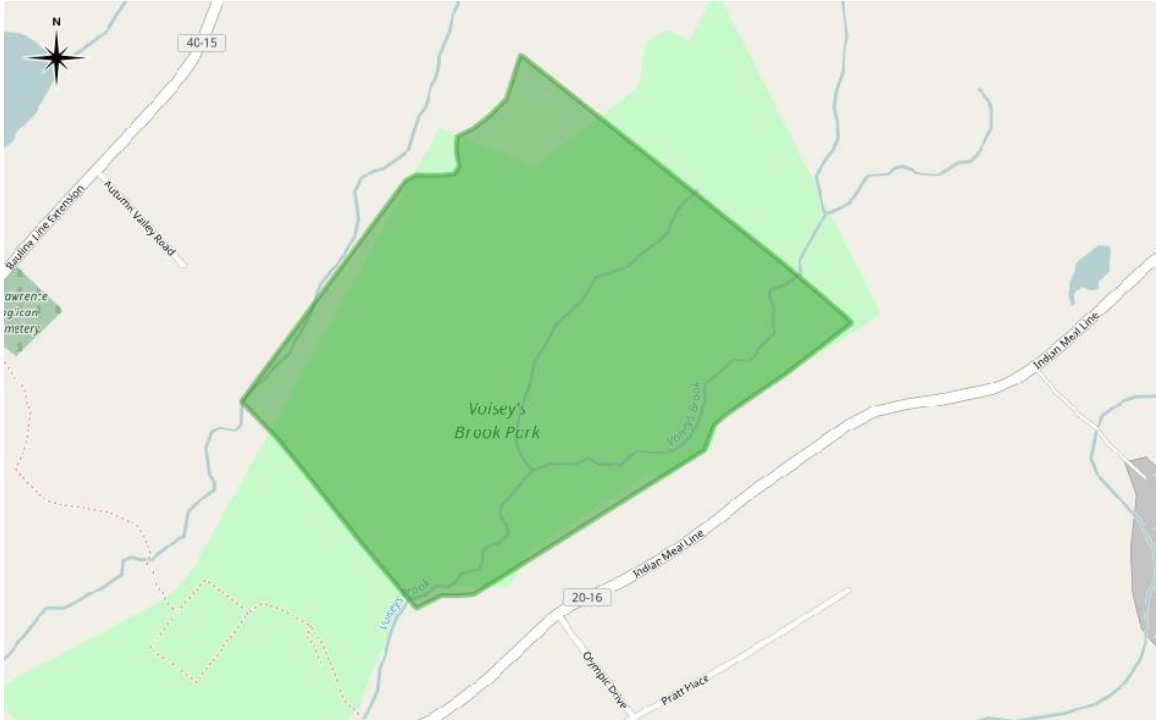


Figure 6: Map of the Voisey's Brook Management Unit

Management unit shown in transparent green; light green shows Voisey's Brook Park
Scale - 1 : 9500

Blast Hole Ponds

This Management Unit is located in the north-western portion of the Town. This area was previously used as a community's water supply (Figures 6,7,8) and as such boating, swimming, and fishing are prohibited (*Water Resources Act*, Section 39, subsection 4 (b)).



Figure 7: Blast Hole Pond
Photo by NL Wildlife Division



Figure 8: Wetland south of Blast Hole Pond, adjacent to the road
Photo by NL Wildlife Division

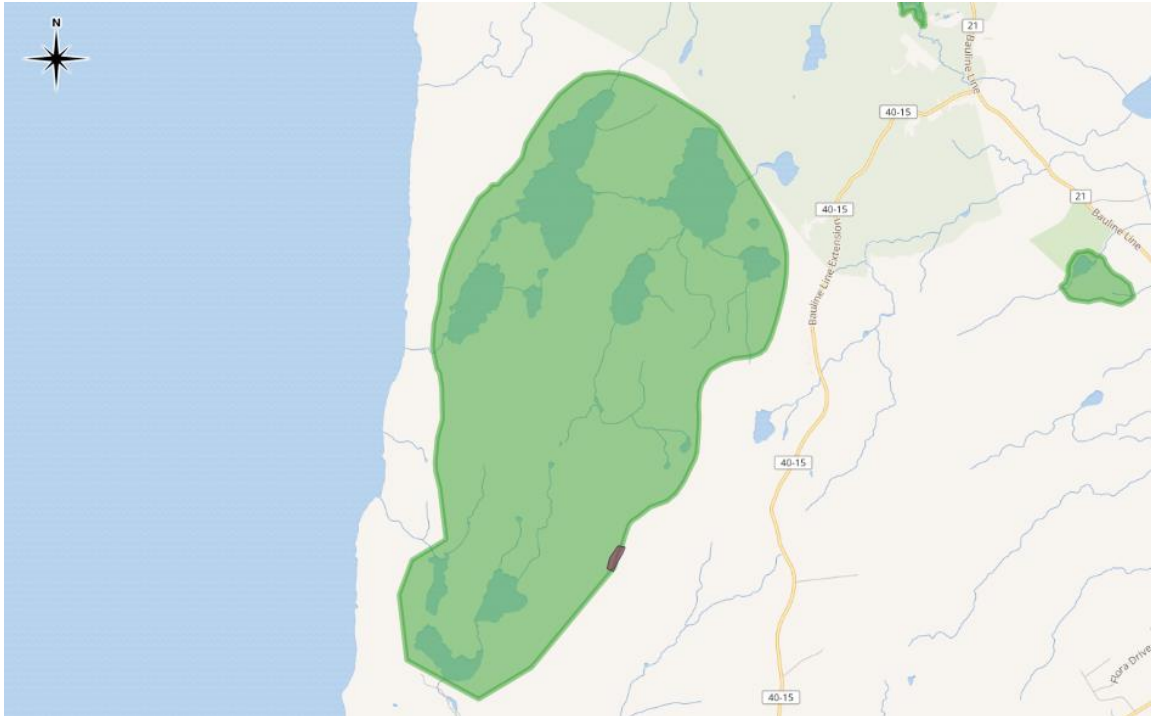


Figure 9: Map of Blast Hole Ponds Management Unit

Management Unit shown in transparent green; Upper Three Corner Pond Management Unit in Torbay can be seen at the eastern edge of the map and a portion of Bauline Rocky Pond Management Unit in Bauline can be seen at the northern edge of the map

Scale - 1 : 50 000

Rivers/Streams of Portugal Cove – St. Philip’s

These Management Units include the riparian buffers around three of the major outlet/runoff rivers/streams which run into the eastern side of Conception Bay (Figures 10). These Management Units and their protection mirrors the idea of the Crown Lands buffer on riparian zones around waterways. They include the stream and tributaries running from Western Pond and Millers Pond into Portugal Cove; the stream running into Conception Bay from Beachy Cove Ponds; and the stream running into Broad Cove from Little Power’s Pond and Barking Kettle Pond. The intent of including these areas under the Stewardship Agreement was to recognize and highlight their strategic and environmental importance to the town, particularly in terms of flood control. These areas are currently municipally zoned as ‘Conservation’, and as such, have a complementary form of protection under the Portugal Cove – St. Philip’s Municipal Plan.

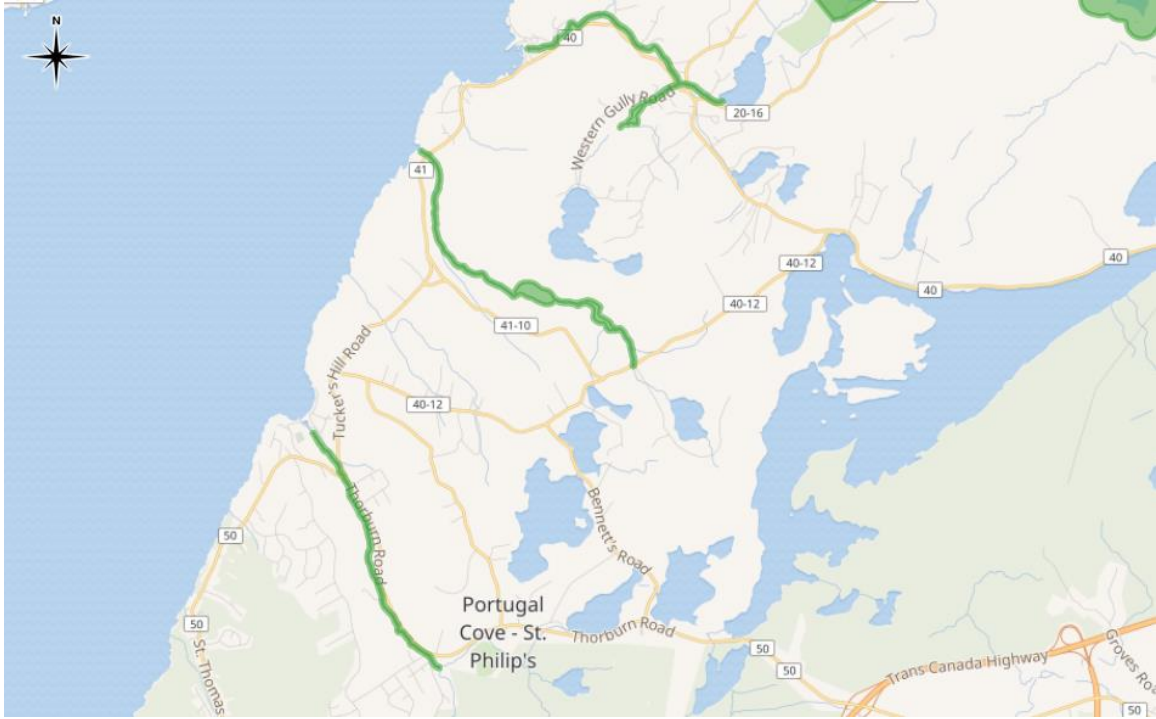


Figure 10: Map of Main River Gully Management Unit, Beachy Cove Brook Gully Management Unit, and Broad Cove River Gully Management Unit

Portions of Voisey's Brook Management Unit and Western Island Pond Management Unit in Torbay are also visible at the northern edge of the map.

Scale - 1 : 69 000

Possible expansion

The Blast Hole Ponds Management Unit may be of interest for an expansion in the near future. Depending on time, mutual interest, and budget, it could possibly be expanded to the west, to include the forested and coastal area, where steep slopes would already preclude most forms of development. An expansion to the north could extend this Management Unit to the municipal planning area boundary (shared with the Town of Bauline). Possibilities for the Town of Bauline to extend their Management Units southwards to create a larger Management Unit which connects with Blast Hole Pond could be explored. Lastly, an extension on the southeastern edge could better protect the site of the 1978 Beechcraft Crash Site, which lies partially inside the Management Unit (Figure 11).

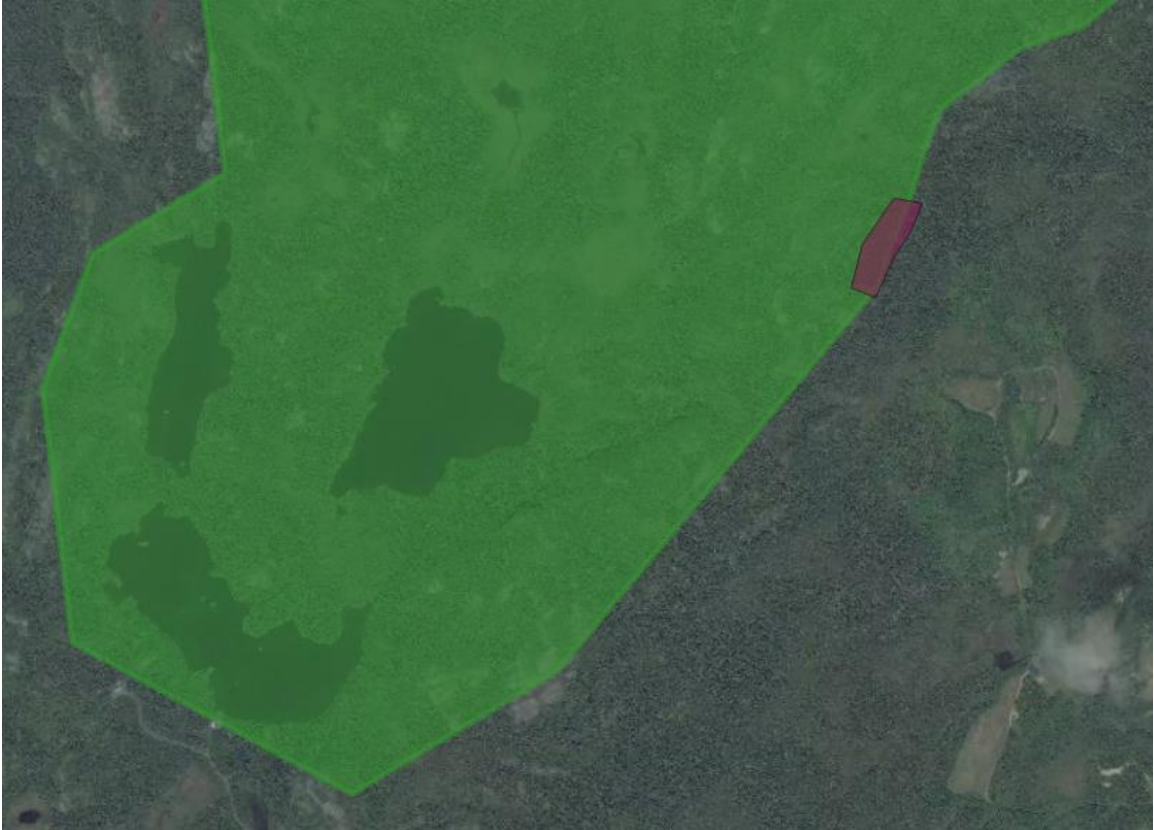


Figure 11: Location of 1978 Beechcraft Crash Site
(in transparent purple) on southeastern boundary of Blast Hole Ponds Management Unit. Location taken from GPS tracks around all site features from *Survey of the 1978 Beechcraft Crash Site Near Bauline Line* (Daly 2016)

Section 5: Habitat Conservation and Education Strategies

The following section presents some ideas for community education, engagement, and habitat enhancement that could be implemented over time in and around Management Units. They are not requirements of being involved but we encourage council to engage its Habitat or Environment Committee or local NL EHJV conservation organizations such as the Stewardship Association of Municipalities (SAM) in the implementation of activities which meet your needs and interests. Indeed community engagement and partnerships are the true strengths of any stewardship agreement.

Many communities across the province who have signed stewardship agreements have had great success becoming involved in exactly these types of projects and will also be resources for you to connect with, especially at SAM meetings. Many of these activities and programs are free or can be funded through small community grants and via partnerships. Specifically, the Recreation Fisheries Conservation Partnerships Program, National Wetland Conservation Fund, and Ducks Unlimited Canada funding have all been important funders of projects in SAM communities, along with many other smaller grants. SAM provides a listing of these and many other relevant grants at samnl.org/funding.

Trails and geocaches

Many communities, including SAM members, have found that trails increase recreation and health for residents and improve tourism possibilities. Trails in Management Units, when planned and constructed carefully, can increase a sense of stewardship by allowing people to discover new areas. They can also help residents and visitors strengthen their connection to nature, especially where interpretive signage (Figure 2) is used to help point out interesting landscape and wildlife features. Geocaches (small containers found via GPS) can be added alongside trails as well to provide a fun inexpensive activity for walkers, hikers, and groups. It is a great idea to place geocaches near or at where you want people to go – to help them discover a new trail, a beautiful lookout, or an interpretive spot, for example.

Bird Monitoring

Local community interest groups and interested volunteers can watch and monitor birds in all areas of Portugal Cove – St. Philip's but, particularly, within Management Units. Data collection can provide information on changes that are occurring within an area and can indicate problems or progress towards desired goals of healthy wildlife populations. By involving local residents, the profile of the area is enhanced to the long-term benefit of conservation. Flora and fauna of areas in PCSP had been

surveyed by earlier Green Teams, and SAM has recently encouraged birdwatchers to spend time in PCSP's Municipal Planning Area. Both of these initiatives have resulted in an increased understanding of the biodiversity in the area; **Appendix 2** provides full lists of species for your reference and use.

eBird.org is a free, easy-to-use site to record your sightings and provide valuable information to help us gain a better understanding about our birds. In Newfoundland and Labrador in 2016, over 280 species of bird were recorded on eBird and over 11,000 individual lists were submitted! Adding your bird and other animal sightings to eBird provides a great opportunity for beginners and experts alike to improve their identifications and provides data in a format that can be easily used for conservation.

Explore all bird sightings in Newfoundland and Labrador:
<http://ebird.org/ebird/canada/subnational1/CA-NL?yr=all>

Start contributing to eBird here:
<https://secure.birds.cornell.edu/cassso/account/create>

Tools for successful bird monitoring:

- A keen eye
- Field notebook & pencil
- Bird field guide
- Binoculars and/or a spotting scope
- Appropriate outdoor clothing
- Phone

When entering data into eBird, do not guess the species - it is entirely acceptable to record a species as unknown. Birding workshops and lots of practice in your local area will make you proficient at identifying species common to your area. As years go by, you will become more and more adept at identification. Be mindful of safety and use common sense when surveying. Aim to cause as little disturbance as possible to the birds, considering that disturbance often impacts foraging and other important activities.

Conservation Corps Green Teams

The Newfoundland and Labrador Conservation Corps (**ccnl.ca**) annually sponsors summer Green Teams and Interns, generally post-secondary and high school students, to work within communities on environmental projects. Such teams have been placed in communities with Stewardship Agreements, including in Portugal Cove – St. Philip's. Potential projects could include constructing and installing nesting platforms followed by monitoring throughout waterfowl breeding and

brood-rearing seasons ('Bird Monitoring', above). This project could be extended to bird houses and would serve to provide data on birds using various habitats.

Green Team members are required to give 3-4 public engagement sessions, and could train local high school students or community members in monitoring. They could also develop educational material such as mini guides of "Birds of Portugal Cove – St. Philip's" or "Plants of Portugal Cove – St. Philip's" which could make use of the flora and fauna surveys of the previous years. The Green Team could also deliver interpretive hikes highlighting interesting natural areas within Management Units.

Artificial Nesting and Loafing Structures

Ospreys

Ospreys (*Pandion haliaetus*) are fish eating raptors that are frequently observed hunting in wetland habitats, particularly areas along the coast. Unfortunately, populations plummeted in North America during the 1950's and 1960's due to the wide spread use of pesticides and other pollutants which have a tendency to bioaccumulate in birds of prey, like the osprey. For many osprey populations, bioaccumulation results in frequent reproductive failures. With the banning of many pesticides in the early 1970's, many osprey populations have made a comeback.

Osprey prefer to nest on tall, often dead, trees on the shoreline of lakes and bays that are at least 2 meters deep but will also make nests in other locations (e.g. telephone poles, communication towers, etc.) if the area is wide open with adequate food. Preferred natural sites are scarce in some areas due to timber harvesting and shoreline developments. If natural nesting sites are scarce in an area, an osprey pair may use a platform for their nest. In many parts of Canada, the installation of artificial nest structures (Figure 12) by concerned community groups have facilitated the comeback of the osprey. Osprey nest structures have been installed at several sites in Newfoundland, including municipal stewardship communities such as Stephenville Crossing.



**Figure 12: Osprey nesting platform in Stephenville Crossing, NL.
Photo by NL Wildlife Division**

Artificial nesting platforms should be located in areas with minimal human impact. Involving 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.

Excellent tips, ideas, and guides for design and placement of Osprey nesting platforms can be found here:

Government of Ontario

lrconline.com/Extension_Notes_English/pdf/ospry.pdf

The International Osprey Foundation

ospreys.com/downloads-2/files/OspreyNestPlan.pdf

New Jersey Division of Fish and Wildlife

www.state.nj.us/dep/fgw/ensp/pdf/osprey_platform_planandmaterials.pdf

Osprey Watch

osprey-watch.org/learn-about-osprey/build-an-osprey-nest

SAM may be able to connect you with individuals experienced in building osprey platforms, and/or those who may be able to help; please contact us if interested.

Island Construction

Many wildlife species, such as terns and waterfowl, nest and loaf on islands due to a reduced risk of predation from land-based predators. Many species in wetlands would benefit from the construction of artificial islands; the SAM-supported wetland restoration project in the Town of Bonavista includes islands intended to keep nesting birds safe from cat predation. These structures can be constructed simply from wooden cribs (Tamarack Larch would be an appropriate choice for building material), measuring approximately 4 m² that have been filled with rock and soil. The islands must be positioned so that they are higher than the highest water mark. Hardy shrubs and herbaceous plants (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) and disturbance to plant and animal communities. One must also consider the potential for increased predation on certain avian species that may use the islands. Annual removal and reinstallation of islands may be necessary in response to ice conditions in tidal influenced areas.

Other forms of artificial islands involve planting native marine plant species into landscaping fabric, which is then fixed to floating structures made of plastic piping or empty gabion baskets (metal mesh cages). 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 when 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 absorbing excess nutrients to deter algae growth. These islands would also likely require annual removal and reinstallation.

Roosting and nesting structures for other wildlife

There are a variety of roosting and nest structures which can be built, installed and monitored/maintained for other bird species such as Tree Swallows (*Tachycineta bicolor*), Northern Flicker (*Colaptes auratus*), Great Horned Owl (*Bubo virginianus*) and for bats (Figure 14). This would prove beneficial to local farmers in that many bird species (and bats) feed on insects and may serve as natural pest control. In addition, providing nests for certain birds may also help reduce (or keep in check) species that may not be desirable to farmers [e.g. American Crow (*Corvus brachyrhynchos*), European Starling (*Sturnus vulgaris*)] and rodents such as mice while increasing biodiversity on the agricultural landscape.



Figure 13: Bat Roosting Box in Salmonier Nature Park
Photo by NL Wildlife Division

Educational Programs

Public education can help foster a greater sense of habitat stewardship among town residents. Even interpretive signs (including the ones provided by SAM, Figure 2) can contribute to an increased understanding and appreciation of local wildlife. Newfoundland and Labrador Environmental Educators (NLEE) hosts a list of environmental education programming that is searchable by subject and grade level at nlee.ca/programs-and-lessons.html

There are several well developed wetland education programs that span every season and age group including *Wetlands in Winter* (Tantramar Wetlands Centre, weted.com), *Marsh Bingo* and *Creatures of the Night* (Oak Hammock Marsh Interpretive Centre, oakhammockmarsh.ca), *Junior Naturalists* (Wye Marsh Wildlife Centre, wyemarsh.com), *Project Webfoot* (Ducks Unlimited Canada, ducks.ca). A number of night programs also exist that would be appropriate for guide and scout troupes. With teachers at Beachy Cove Elementary already involved in environmental initiatives, this could be a good place to introduce the concept of stewardship and raise awareness of your five PCSP Management Units.

Libraries can also be excellent places for educational programming as they often offer a variety of early childhood and family programs with experienced staff.

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 wildlife.

Backyard Habitat for Canada's Wildlife

This habitat awareness initiative by the Canadian Wildlife Federation is administered in conjunction with the Wildlife Division's Salmonier Nature Park. This program enables you 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 can be 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 natural beauty 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 sites like **crayola.com** which offer special resource grants to educators.

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

Hunter Skills Workshops

A municipality may be able to partner with a local rod and gun club, the Wildlife Division (Conservation Services), and other partners to participate in hosting a *Youth Hunter Skills Workshop*. These events are sponsored by the Wildlife Division and require significant volunteer commitment, organization, and expertise. However, they can be very rewarding for participants and foster a sense of stewardship among youth and teenagers. These workshops have taken place in

communities such as Goose Bay, Gander, Lewisporte, and St. John's which have active rod and gun clubs or hunting associations nearby. Similarly, the Becoming an Outdoorswoman program can help introduce women in the community to sustainable, legal hunting and fishing and is offered yearly through the Wildlife Division in various communities.

Ducks Unlimited Canada's Youth Programs

Project Webfoot

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

Wetland Heroes

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

Engagement for adults

It's not just kids that enjoy the outdoors – adults and seniors benefit greatly from spending time in nature as well. Birdwatching workshops have been successful in many SAM communities (such as Spaniard's Bay), and snowshoe hikes in the winter or hikes in the summer are often enjoyed by adults as well. Themes can be used, such as tracking hikes, edible plant hikes, or winter ecology hikes, to increase interest. These can be inexpensive ways for adults in your community to discover the natural areas of the town, socialize, and learn something new. Ducks Unlimited Canada, an EHJV partner, can in some cases partner on trail projects in important wildlife areas if time and funding allows, and CCNL Green Teams are required to give interpretive presentations as a part of their summer work programs. SAM provides six different interpretive field guides at **samnl.org/interpretive-walking-tour-guides** that could help Green Teams or summer recreational staff lead hikes for residents and/or visitors to PCSP. On that page, we also have a Guide to

delivering interpretive hikes which can assist you. The lists of species found in **Appendix 2** are also meant to be a helpful resource for you. These could be used to create brochures of 'bird checklists' of the area, or used as the basis for field guides which could be developed by a Green Team, high school, or by your relevant committee. Adults often enjoy using birdwatching towers or blinds (**Appendix 4**) as well; these could be fun community building projects or completed with the help of a Green Team, committee, or volunteers.

Habitat Enhancement

In some wetland areas, habitat has been degraded or lost and could benefit from plantings. Some aquatic plant species improve water condition by absorbing excessive amounts of nitrogen, phosphorous, and carbon – substances associated with the occurrence of algal blooms. Many beneficial plant species have limited distribution in Newfoundland, and should not be introduced into the environment without consideration of the potential consequences, including the possibility of invasive plants out-competing native plant species. **Appendix 5** provides a helpful guide to plant species for restoration projects. The closest Ducks Unlimited Chapter to Portugal Cove – St. Philip's is in St. John's and could perhaps act as a partner on some future projects as well. They can be contacted through **du_newfoundland@ducks.ca**.

For example, Eelgrass (*Zostera marina*) is an aquatic grass known to have significant value for waterfowl and providing habitat for many aquatic species such as juvenile salmon and trout. It is possible to encourage the growth of eelgrass beds through an inexpensive project of habitat management and shoot transplantation from a nearby donor site. Some species of Willow (*Salix* sp.) and Alder (e.g. Green Alder, *Alnus viridis crispa*) are native to the island of Newfoundland and are renowned for their hardiness, ability to withstand tidal inundation, and extensive networks of roots.

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.

Various retailers throughout the province may have expertise in selecting, planting, and caring for native plants or experience with restoration projects. Timothy Murray, a landscape architect at Murray's Garden Centre and Horticultural Services in Portugal Cove is experienced with ecological restoration and can be contacted at **timothymurray@murraysgardens.com** or **709 895 2800** for potential projects. A wetland restoration project is in progress in the SAM community of Bonavista and lessons learned from this project will be shared with SAM members.

Litter Removal & Reduction

Community interest groups and individual residents can work cooperatively to remove the large quantity of litter in and around all portions of the community on a regular basis, while avoiding times when waterfowl may be disturbed during breeding, staging or brood rearing periods (May to August). Programs such as the Marine Institute's Ocean Net (mi.mun.ca) and the Great Canadian Shoreline Cleanup (shorelinecleanup.ca) assist communities in organizing litter cleanups.

PCSP already has an annual cleanup in May or June; promotion for these types of events can be a challenge, however. To increase public participation in your cleanup, try inviting other local groups like your Hiking and Walking Club, Rowing Club, or Women's Institute. You can also list it for free with NLEN (nlenvironmentnetwork.org, then go to Events > Submit an Event). NLEN will advertise environmental events from municipal governments, so this advertising possibility would not be limited to litter cleanups. You could also try promoting a litter cleanup by messaging it to or tweeting it [@StJohnsEcoEvent](https://twitter.com/StJohnsEcoEvent) on Twitter, which collects local environmental events. You could also ask to cross-promote it through MUN networks, Nature NL, and the Wildflower Society. Most radio stations in St. John's will also read announcements on air for free (many just require a quick online submission of your event); communitysector.nl.ca/mediaroom has a list of media contacts. MMSB also provides community grants to municipalities to help with waste reduction and illegal dumping; more information on their municipal programs is at mmsb.nl.ca/partners/municipalities

SAM involvement

SAM was pleased to attend the Portugal Cove – St. Philip's environmental fair this April 2017, and would be glad to be invited in the future. If time allows, SAM and/or one of our partners may be able to give presentations and do activities at the Portugal Cove – St. Philip's summer day camps.

Conclusion

We hope the ideas in this guide have started you thinking about possible ways your committee and your community could become involved in protecting and enhancing wildlife habitat in your area. Keep an eye on samnl.org, where additional resources are added regularly. Remember, involving local people is the true strength of a Stewardship Agreement!

Appendix 1: Portugal Cove – St. Philip’s Municipal Stewardship Agreement

MUNICIPAL HABITAT STEWARDSHIP AGREEMENT

THIS AGREEMENT made at Portugal Cove-St Philips, in the province of Newfoundland and Labrador, this 19th day of June, 2015.

BETWEEN: **HER MAJESTY THE QUEEN IN RIGHT
OF NEWFOUNDLAND AND LABRADOR,**
as represented by the Honourable the Minister
of Environment and Conservation
(herein called the “Minister”)

- of the one part -

AND: **THE TOWN COUNCIL OF THE TOWN OF
PORTUGAL COVE-ST PHILIPS,**
a municipal corporation pursuant to Section 15 of the
Municipalities Act, 1999 (herein called the “The Town”)

- of the other part -

WHEREAS the Government of Newfoundland and Labrador has entered into an Agreement with others for the implementation of the 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 wetland and upland habitats are fundamental tools in maintaining and enhancing wildlife populations in the province;

AND WHEREAS the Minister proposed that certain important wetlands and associated wildlife habitats within the Town be protected and enhanced through and with the cooperation of the Town in accordance with this Agreement and a Habitat Conservation Plan developed hereafter;

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

NOW THEREFORE IT IS AGREED BY THE PARTIES AS FOLLOWS:

1. The lands herein delineated and designated as a Management Unit (being the lands outlined on a certain Schedule annexed hereto and marked "A") shall be managed in accordance with the terms and conditions of this Agreement including any Habitat Conservation 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 Management Units that have no negative or adverse impact upon the wetland habitat or the waterfowl or other wildlife which utilize those habitats.
3. The parties may establish other Management Units as may be desirable from time to time. The Management Units shall be subject to the terms and conditions of the Habitat Conservation Plan developed to enhance and protect the wetland habitats, the waterfowl and other wildlife which utilize those habitats.
4. The Habitat Conservation Plan shall be developed in cooperation with the Town and the Minister agrees to provide such advice and expertise necessary or advisable for the development of the Habitat Conservation 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 as it prescribed under subsection 13(3)(f) of the *Urban and Rural Planning Act (2000)* (or such other legislation in amendment or substitution therefore as may be brought into effect from time to time). The Town in passing regulations or by-laws related to the protected areas so designated under the Municipal Plan or amendments thereto and which may affect the Management Units 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 Management Units 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 Conservation Plan.
7. If at any time during the term of this Stewardship Agreement the Parties deem it necessary or desirable to make any alterations or additions to it, they may do so by means of a written amendment between them which shall be supplemental to and form part of this agreement.


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

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

SIGNED, SEALED AND DELIVERED

by the Honourable the Minister of Environment
and Conservation in the presence of:



Witness



GOVERNMENT OF NEWFOUNDLAND
AND LABRADOR, DEPARTMENT OF
ENVIRONMENT AND CONSERVATION

THE SEAL OF the Town Council of the
Town of Portugal Cove-St Philips
hereunto affixed in the presence of:

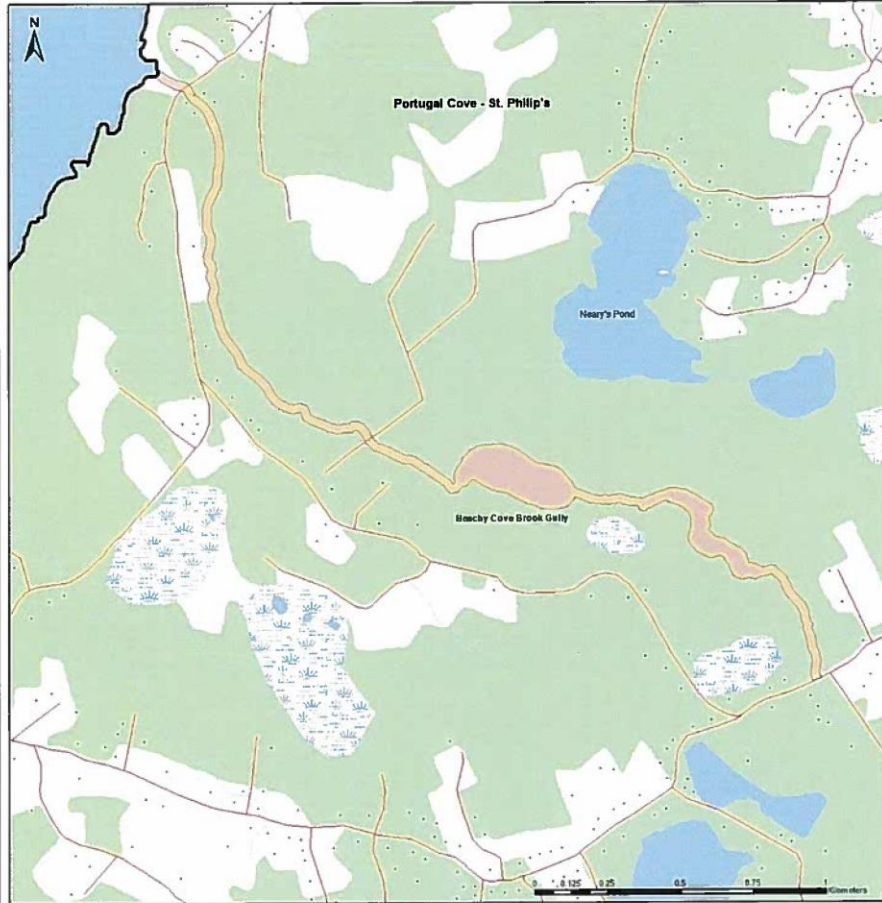

Witness



THE TOWN COUNCIL OF THE TOWN
OF PORTUGAL COVE-ST PHILIPS

SCHEDULE A

Management Units for the Town of Portugal Cove - St. Philip's



Legend

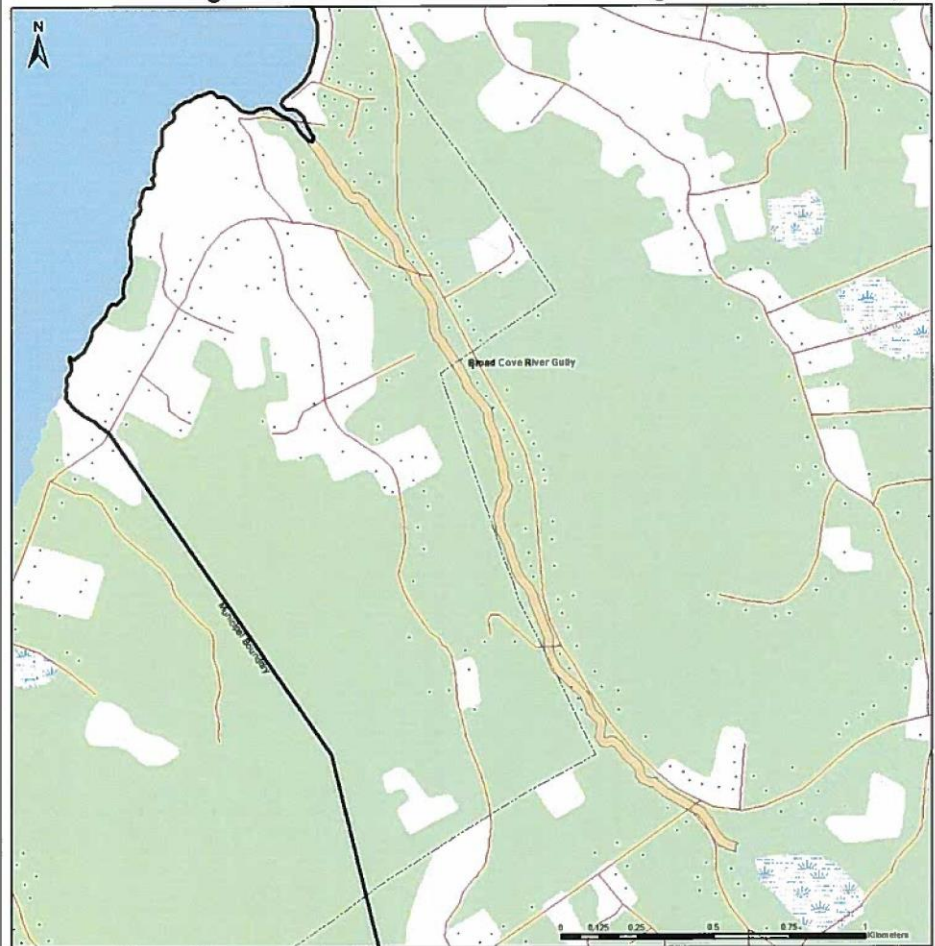
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|---|--------------------|---|-------------|
|  | Management Units |  | Bogs |
|  | Municipal Boundary |  | Waterbodies |
|  | Buildings |  | Vegetation |
|  | Roads | | |
|  | Powerline | | |
|  | River/Streams | | |

Newfoundland
Labrador



Projection Information:
TM NAD 83 CNT
November 2013

Management Units for the Town of Portugal Cove - St. Philip's

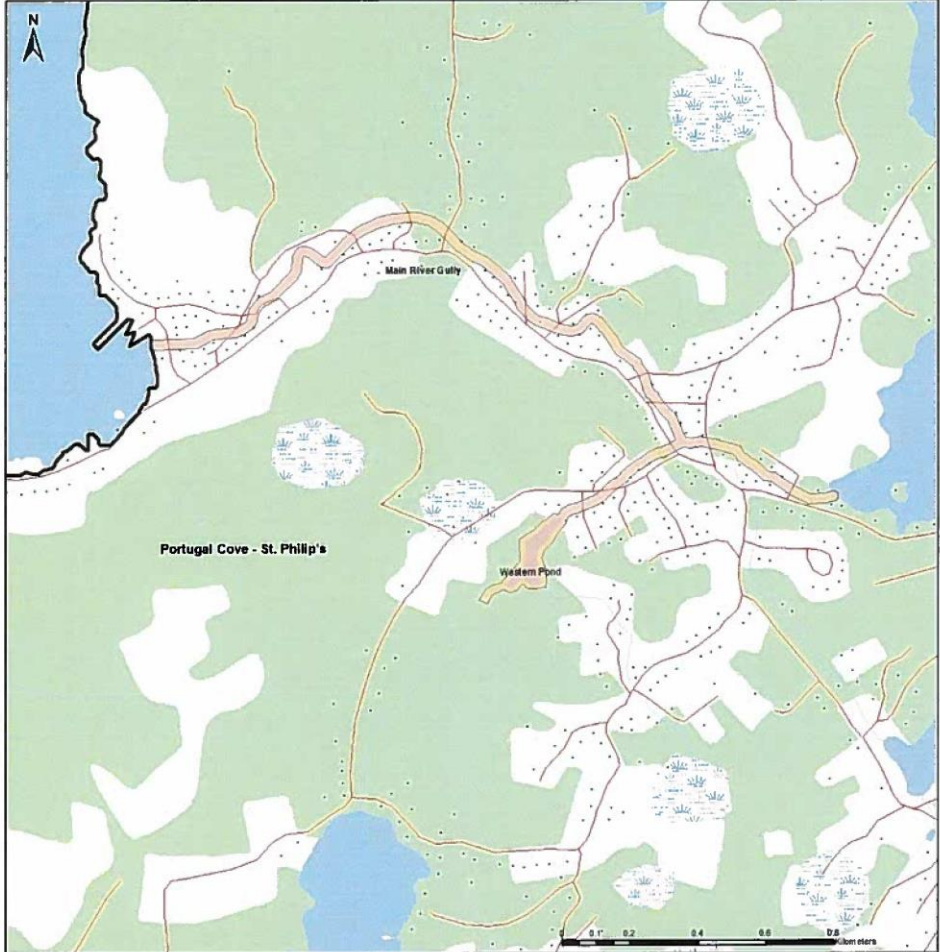


- Legend**
- Management Units
 - Municipal Boundary
 - Buildings
 - Roads
 - Powerline
 - River/Streams
 - Bogs
 - Waterbodies
 - Vegetation

**Newfoundland
Labrador**


Projection Information:
TM NAD 83 CNT
November 2013

Management Units for the Town of Portugal Cove - St. Philip's



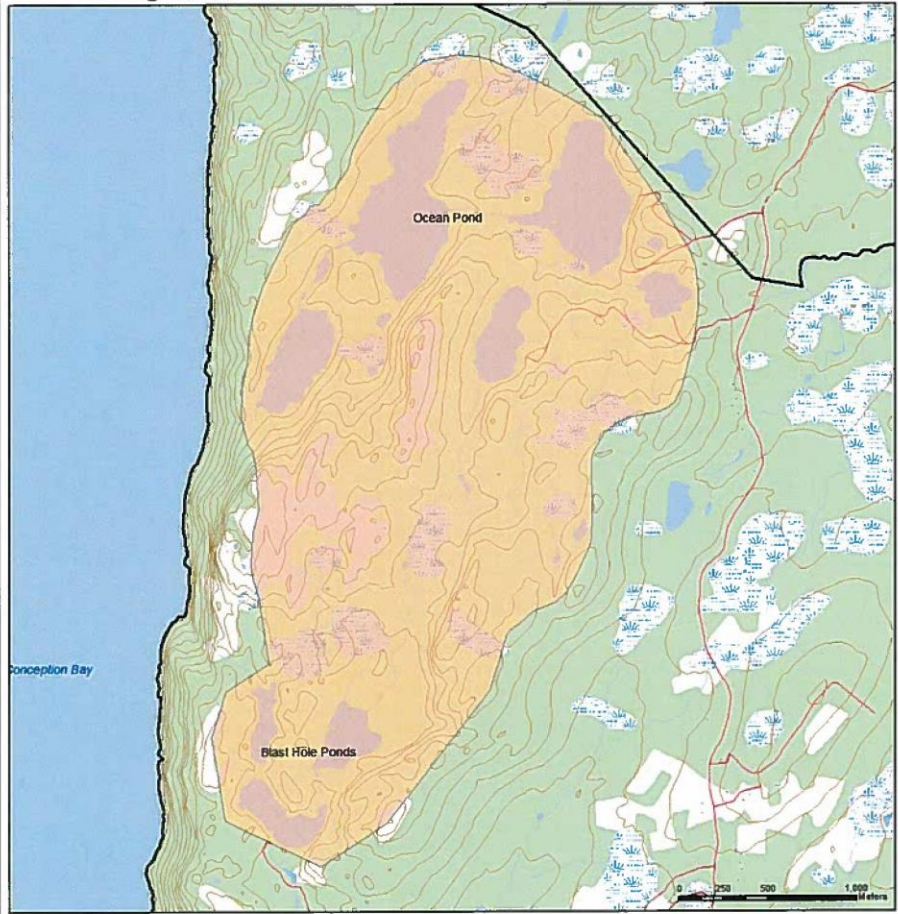
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- Management Units
 - Municipal Boundary
 - Buildings
 - Roads
 - Powerline
 - River/Streams
 - Bogs
 - Waterbodies
 - Vegetation

**Newfoundland
Labrador**



Projection Information:
TM NAD 83 CNT
November 2013

Management Unit for the Town of Portugal Cove - St. Philip's

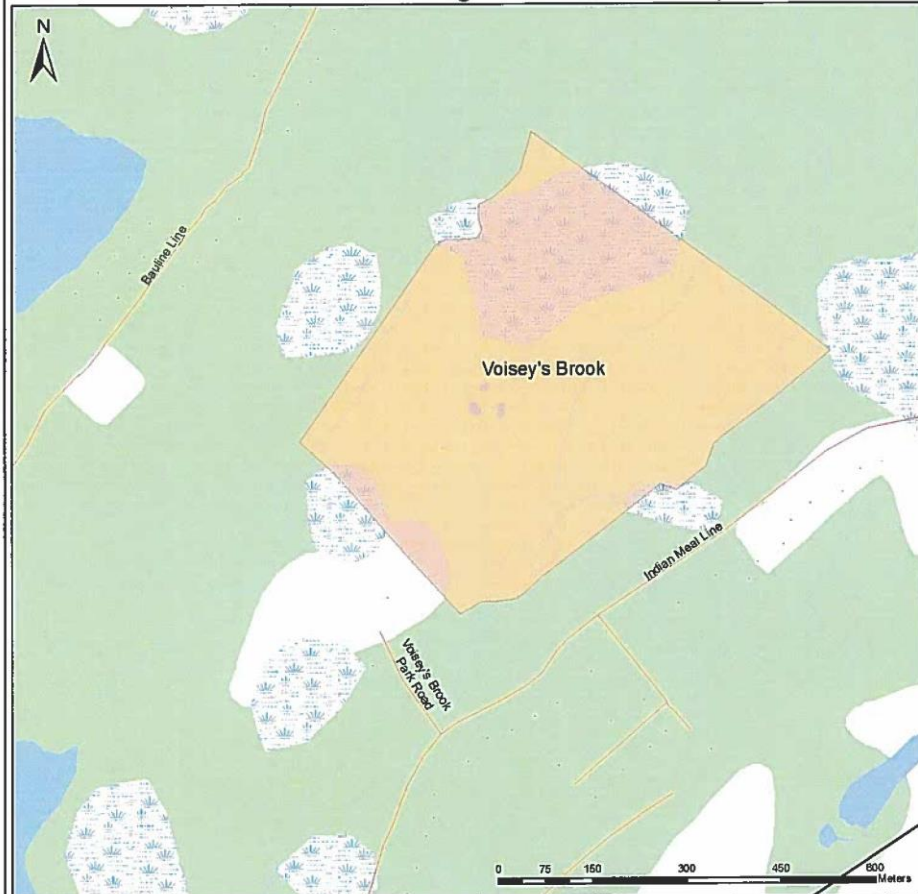


Legend

- Proposed Management Unit
- Municipal Boundary
- Buildings
- Roads
- Powerline
- River/Streams
- Bogs
- Waterbodies
- Vegetation

Projection Information:
 TM NAD 83 CNT
 November 2013
 revised June 2015

Management Units for the Town of Portugal Cove - St. Philip's



Legend

- | | |
|--------------------|-------------|
| Municipal Boundary | Bogs |
| Management Unit | Waterbodies |
| Buildings | Vegetation |
| Roads | |
| Powerline | |
| River/Streams | |

**Newfoundland
Labrador**



Projection Information:
TM NAD 83 CNT
August 2012

Appendix 2: Wildlife found in the Town of Portugal Cove – St. Philip’s

Birds (sightings from ebird.org, accessed March 2017)

Name	Latin name	Alternate or local name	Conservation status
American Crow	<i>Corvus brachyrhynchos</i>		
American Goldfinch	<i>Carduelis tristis</i>		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Grepe	
Black-capped Chickadee	<i>Poecile atricapillus</i>		
Black-legged Kittiwake	<i>Rissa tridactyla</i>	Ticklearse, Tickleace, Tickle-ass, Lady-bird, Lady	
Black Guillemot	<i>Cepphus grylle</i>	(Sea) Pigeon	
Blue Jay	<i>Cyanocitta cristata</i>		
Boreal Chickadee	<i>Poecile hudsonicus</i>		
Dark-eyed Junco	<i>Junco hyemalis</i>		
Dickcissel	<i>Spiza americana</i>		
Eastern Kingbird	<i>Tyrannus tyrannus</i>		
Golden-crowned Kinglet	<i>Regulus satrapa</i>		
Gray-Cheeked Thrush	<i>Catharus minimus</i>		Threatened provincially
Great Black-backed Gull	<i>Larus marinus</i>	Saddleback, saddler	
Great Blue Heron	<i>Ardea herodias</i>		
Great Cormorant	<i>Phalacrocorax carbo</i>	Shag, toggle	
Herring Gull	<i>Larus argentatus</i>	Bluey, blue gull, glue gull	
Iceland Gull	<i>Larus glaucoides</i>		
Mourning Dove	<i>Zenaida macroura</i>	Love birds	
Northern Flicker	<i>Colaptes auratus</i>		
Osprey	<i>Pandion haliaetus</i>		
Peregrine Falcon	<i>Falco peregrinus</i>		Special Concern federally (SARA), Vulnerable

			provincially
Pine Grosbeak	<i>Pinicola enucleator</i>	Mope	
Red-breasted Merganser	<i>Mergus serrator</i>	Shellbird, shellduck	
Red-breasted Nuthatch	<i>Sitta canadensis</i>		
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>		
Red Crossbill	<i>Loxia curvirostra</i>		
Sora	<i>Porzana carolina</i>		
Sharp-shinned Hawk	<i>Accipiter striatus</i>		
Willow Ptarmigan	<i>Lagopus lagopus</i>	Brooker, (white or willow) partridge	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>		

Other wildlife found in Voisey's Brook Park (Adapted from 2005 Green Team Report by Leigh Anne Butler, Amanda Langille, Neil Clarke, and Courtney Barbour)

Plants

Birdfoot Trefoil	<i>Lotus corniculatus</i>	Introduced
Black Knapweed	<i>Centaurea nigra</i>	Introduced
Blue Flag Iris	<i>Iris versicolor</i>	Native
Bog Laurel (Swamp Laurel)	<i>Kalmia polifolia</i>	Native
Bullhead Lily	<i>Nuphar variegatum</i>	Native
Bunchberry (Crackerberry, Dwarf Cornel)	<i>Cornus canadensis</i>	Native
Butter-and-Eggs (Toadflax)	<i>Linaria vulgaris</i>	Introduced
Buttercup	<i>Ranunculus sp.</i>	Native
Canada Mayflower (Bead Ruby)	<i>Maianthemum canadense</i>	Native
Common Strawberry	<i>Fragaria virginiana</i>	Native
Common Evening Primrose	<i>Oerothera biennis</i>	Native
Corn Lily (Blue Bead Lily, Poison Berry)	<i>Clintonia borealis</i>	Native
Cotton Grass	<i>Eriophorum sp.</i>	Native
Clover (Red, White, Alsike)	<i>Trifolium sp.</i>	Introduced

Common St. John's Wort	<i>Hypericum perforatum</i>	Introduced
Fireweed	<i>Epilobium angustifolium</i>	Native
Foxglove	<i>Digitalis purpuria</i>	Introduced
Hemp-Nettle	<i>Galeopsis tetrahit</i>	Introduced
Indian Pipe (Ghost pipe, Corpse Plant)	<i>Monotropa uniflora</i>	Native
Labrador Tea	<i>Ledum groenlandicum</i>	Native
Lady's Thumb	<i>Polygonum persicaria</i>	Introduced
Northern Wild Raisin (Witherod)	<i>Viburnum cassinoides</i>	Native
One-flowered Wintergreen (Single Delight)	<i>Moneses uniflora</i>	Native
Orange Hawkweed (Devil's Paintbrush)	<i>Hieracium aurantiacum</i>	Introduced
Ox-eye Daisy	<i>Chrysanthemum leucanthemum</i>	Introduced
Pink Lady's Slipper	<i>Cypripedium acaule</i>	
Rough Cinquefoil	<i>Potentilla norvegica</i>	Native
Sheep Laurel (Lambkill, Goo Witty, Gold-withy)	<i>Kalmia angustifolia</i>	Native
Spearwort	<i>Ranunculus flammula</i>	Native
Starflower	<i>Trientalis borealis</i>	Native
Sundew	<i>Drosera rotundifolia</i>	Native
Tansy Ragwort	<i>Senecio jacobaea</i>	Introduced
Twinflower	<i>Linnaea borealis</i>	Native
Wild (Shining) Rose	<i>Rosa nitida</i>	Native
Wild Rose	<i>Rosa rugosa</i>	Introduced
Wintercress	<i>Barbarea vulgaris</i>	Introduced
Wood Strawberry	<i>Fragaria vesca</i>	Native
Yarrow (Milfoil)	<i>Achillea millefolium</i>	Some varieties native

Trees

American Mountain Ash	<i>Sorbus americana</i>	?
Balsam Fir	<i>Abies balsamea</i>	Native
Black Spruce	<i>Picea mariana</i>	Native
Larch	<i>Larix laricina</i>	Native
Mountain Alder	<i>Alnus crispa</i>	Native
White Birch	<i>Betula papyrifera</i>	Native
White Spruce	<i>Picea glauca</i>	Native

Mammals

Coyote	<i>Canis latrans</i>	Natural range expansion
Moose	<i>Alces alces</i>	Introduced

Red Squirrel	<i>Tamiasciurus hudsonicus</i>	Introduced
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Amphibians

American Toad	<i>Bufo americanus</i>	Introduced
Green Frog	<i>Rana clamitanus</i>	Introduced

Fungus

Witches Butter	<i>Tremella mesenterica</i>	Native
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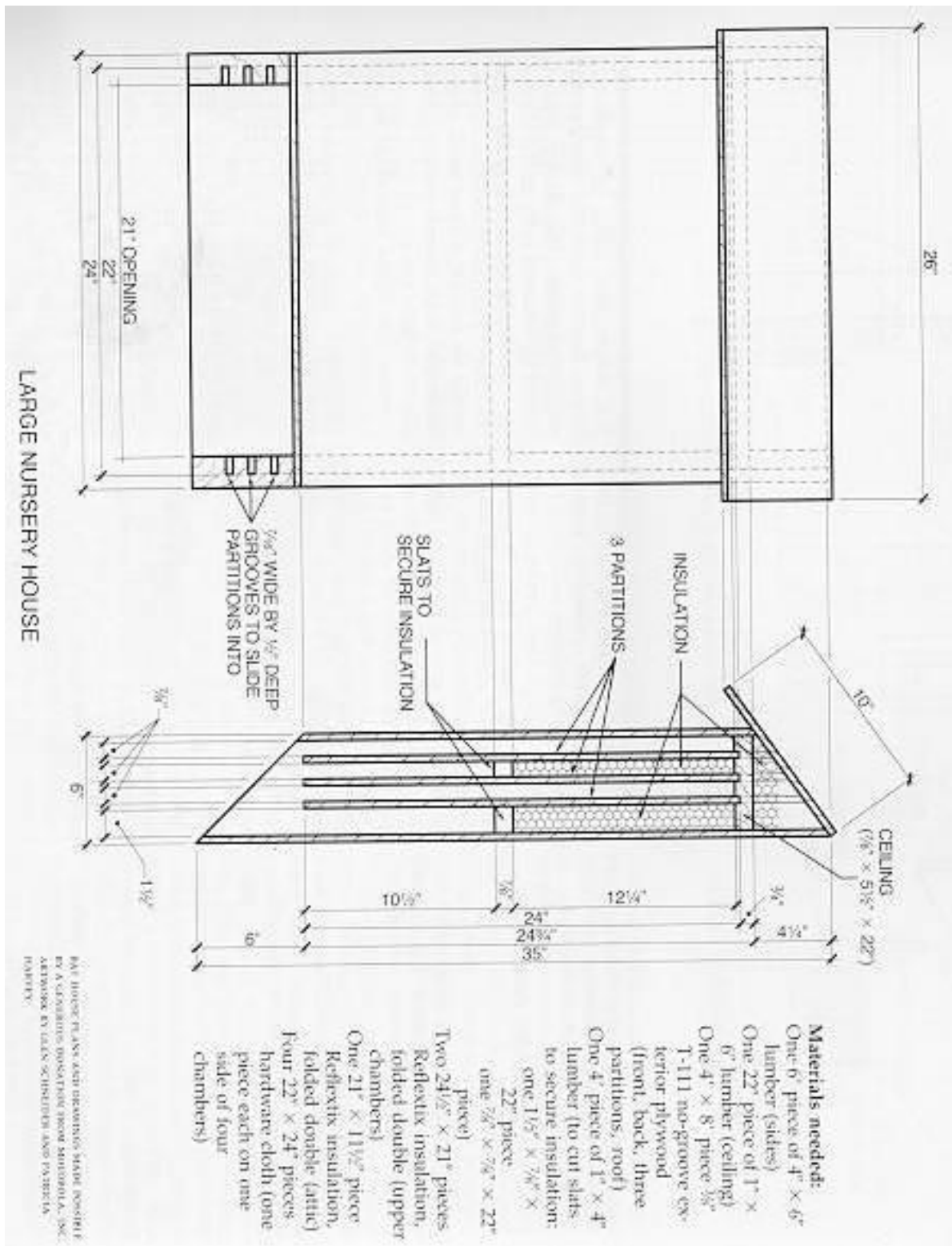
Appendix 3: Bird & Bat Houses

Species	Specifications					
	Inches				Feet Above Ground	Preferred Habitat
	Entrance		Floor Dimensions	House Depth		
	Diameter	Above Floor				
Bluebird	1 ½	6-7	5 x 5	8-9	5-10	Open field with perches
Chickadee, black capped	1 ½	6-8	4 x 4	8-10	5-15	Woodland with perches
" Carolina	1 ½	6-8	4 x 4	8-10	6-15	Woodland
Flicker	2 ½	14-16	7 x 7	16-18	6-20	Woodland
Fly catcher, great crested	2	6-8	6 x 6	8-10	8-20	Woodland
Kestrel	3	9-12	8 x 8	12-15	10-30	Open field
Martin, purple	2 ½*	18	6 X 6*	6*	15-20	Open fields AWAY from trees & near water
Nuthatch, white-breasted	1 ¼	6-8	4 x 4	8-10	12-20	Woodland
Owl, barred	7 x 7 arch	12	12 x 12	23	20-23	Woodland
" screech-	3	9-12	8 x 8	12-15	10-30	
" barn	6 x 6	6	12 x 36	15-18	20-25	
Phoebe	Open front & sides		7 x 7	8	8-12	Backyard
Robin	Open front & sides		7 x 7	8	8-12	Backyard
Swallow, tree	1 ½	1-5	5 x 5	6	6-10	Open field near water
Titmouse, tufted	1 ¼	6-8	4 x 4	8-10	6-15	Woodland edge & interior
Warbler, prothonotary	1 ½	6	5 x 5	8	5-10	Over and near water
Woodpecker, downy	1 ¼	6-8	4 x 4	8-10	6-20	Woodland interior
" hairy	1 ½	9-12	6 x 6	12-15	12-20	
" red-bellied	2 ½	10-12	6 x 6	12-14	12-20	
" red-headed	2	9-12	6 x 6	12-15	12-20	
Wren, Carolina	1 ½	4-6	4 x 4	6-8	5-10	Near brushy areas & backyards
" house	1 ¼	4-6	4 x 4	6-8	5-10	

*These are the dimensions for one compartment. Martins nest in colonies; therefore, martin houses should have a minimum of six self-contained apartments.

Removing unwanted species such as starlings and house sparrows will increase your chances for nesting success.

Plan for a bat roosting box



Bat Box in Pynn's Brook, NL



Photo by NL Wildlife Division

Appendix 4: Bird viewing towers, blinds, and lookouts



Viewing Tower in Hankasalmi, Finland. Photo from Wikipedia



Enclosed bird blind with mural in Winterland. Photo by NL Wildlife Division



Simple inexpensive bird blind in Grand Falls - Windsor, NL
Photo by Corduroy Brook Enhancement Association, corduroybrook.org



Image of viewing deck in Winterland, NL
Photo by NL Wildlife Division

Appendix 5: Plants for ecological restoration

This guide to grasses, herbaceous plants, shrubs, and trees for ecological restoration projects in and around wetlands has been compiled by SAM (Stewardship Association of Municipalities, samnl.org) for Newfoundland and Labrador. Species recommended by Todd Boland, MUN Botanical Garden, or Tim Murray and Lorna Hogan, Murray's Gardens and Landscape Services, are **bolded** and listed first in their category. Other information in this guide is adapted from Canadian Wildlife Federation's Restore a Ribbon of Life (cwf-fcf.org/en/resources/for-educators/lesson-plans/archive/habitat-projects/members/ribbon-of-life.html), missouribotanicalgarden.org, illinoiswildflowers.info, and plants.usda.gov.

Herbaceous Plants

English name	Latin name	Range	Site Requirements	Conservation Value
Joe-pye weed	<i>Eutrochium maculatum</i>	Coast to coast	Wetlands, meadows, marshes, fens; less tolerant of disturbance	Highly attractive to butterflies, honeybees, bumblebees
Tall Meadowrue	<i>Thalictrum pubescens</i>	ON, QC, NB, PEI, NS, NL	Lower, wetter sites	Food source for pollinators and other invertebrates
Blue flag iris	<i>Iris versicolor</i>	MB, ON, QC, NB, PEI, NS, NL	Wet sites, shallow water	Attractive to pollinators such as bees, butterflies, and moths, as well as to other insects; provides cover
Purple-stem (swamp) aster	<i>Symphotrichum puniceum</i>	Coast to coast	Swamps, open wet areas with sun	Attractive to a wide variety of pollinators and insects
Turtlehead	<i>Chelone glabra</i>	MB, ON, QC, NB, PEI, NS, NL	Moist to wet soils; full to partial sun	Attractive to pollinators such as bumblebees, butterflies, and other insects; erosion control

Rough-stemmed goldenrod	<i>Solidago rugosa</i>	ON, QC, NB, PEI, NS, NL	Low woods, barrens, bogs, old fields	Attractive to a wide variety of pollinators and insects; food source for passerine birds and grouse
Lance-leaved goldenrod	<i>Euthamia graminifolia</i>	Coast to coast	Moist soil, wetland edges, ditches	Food source for goldfinch, sparrows, and some mammals; attractive to pollinators
Fireweed	<i>Chamerion angustifolium</i>	Coast to coast	Full or partial sun; moist soil	Attractive to pollinators; food source for insects and some mammals
White-topped aster	<i>Doellingera umbellata</i>	ON, QC, NB, PEI, NS, NL	Full or partial sun; slightly wet to moist soil	Food source for songbirds and grouse; attractive to pollinators including bees and butterflies
New York aster	<i>Symphotrichum novi-belgii</i>	QC, NB, PEI, NS, NL	Brackish or salt marshes; riparian areas	Late season food source for songbirds; attractive to pollinators including bees and butterflies

Shrubs & small trees

English name	Latin name	Range	Site Requirements	Conservation Value
Balsam-poplar	<i>Populus balsamifera</i>	Coast to coast	Full sun to partial shade; prefers most soils on shorelines	Erosion control; vegetation buffer; wildlife food, cover, and nesting sites
Bebb's or Beaked Willow	<i>Salix bebbiana</i>	Coast to coast	Tolerant to a range of wet soils; full sun to partial shade	Erosion control, bank stabilization, excess nutrient uptake, food source
Broad leaved Meadowsweet	<i>Spiraea latifolia</i>	MB, ON, QC, NB, NS, PEI, NL	Moist clay, sand, or loam soils with sun or partial shade	Food for birds, butterflies, and bees; host plant for Spring Azure butterfly
Green alder	<i>Alnus crispa</i>	Coast to coast	Nutrient-poor sites with normal or moist soil; sun or partial shade	Erosion control and bank stabilization, excess nutrient uptake, food source; fixes nitrogen
Grey/ speckled alder	<i>Alnus incana</i>	Coast to coast	Riparian areas; wide range of soil types and moisture levels	Erosion control and bank stabilization, excess nutrient uptake, food source; fixes nitrogen
Highbush cranberry	<i>Viburnum trilobum</i>	AB, SK, MB, ON, QC, NB, NS, PEI, NL	Stream banks and lake shores; wide range of soils; shade tolerant	Erosion control; vegetation buffer; fence row; food for birds and mammals
Purple chokeberry	<i>Aronia floribunda</i>	ON, QC, NB, NS, PEI, NL	Wet soils; wetland edges	Fruits are a good food source for birds
Pussy-willow	<i>Salix discolor</i>	Coast to coast	Full sun; deep, rich shoreline soils; moist to wet	Vegetation buffer; fence row; nectar source for pollinators; food source

		conditions		
Red-osier dogwood	<i>Cornus sericea</i> / <i>Cornus stolonifera</i>	Coast to coast	Full sun to partial shade in moist to wet soils; stream banks; lake shores; wetlands	Vegetation buffer; fence row; food, cover, and nesting sites for birds and mammals
Shining Rose	<i>Rosa nitida</i>	ON, QC, NB, NS, PEI, NL	Bogs and wet soils	Food source for songbirds and grouse; attractive to pollinators such as bumblebees and other bees
Sweet gale, bog myrtle	<i>Myrica gale</i>	Coast to coast	Bogs, intertidal areas	Fixes nitrogen; food for a variety of insects, including butterflies
Winterberry	<i>Ilex verticillata</i>	ON, QC, NB, NS, PEI, NL	Partial sun, wet to moist conditions	Important winter food for songbirds, other small birds, and mammals;
American mountain ash	<i>Populus balsamifera</i>	Coast to coast	Full sun; wide range of soils	Vegetation buffer; wildlife food, cover, and nesting sites
Blackberry	<i>Rubus</i> sp.	Coast to coast	Moist, well-drained soils	Vegetation buffer; fence row; food and cover for birds and mammals; butterfly nectar source
Elderberry	<i>Sambucus</i>	Coast to coast	Full sun to full shade; rich, moist soils	Food and cover for shoreline birds and mammals; butterfly nectar source
Raspberry	<i>Rubus</i> sp.	YT, NWT, BC, ON, QC, NB, NS, PEI, NL	Wide range of soils; shade tolerant; flood tolerant; stream banks and lake shores	Erosion control; vegetation buffer; fence row; food and shelter for birds and mammals
Wild black currant	<i>Ribes americanum</i>	YT, NWT, AB, SK, MB, ON, QC, NB, NS, PEI, NL	Wide range of soils; moist to wet shorelines	Erosion control; vegetation buffer; fence row; wildlife food and cover; butterfly nectar source

Other shrubs which may also be useful for restoration projects, although not in very wet sites:

Bearberry / kinnikinnick: *Arctostaphylos uva-ursi*

Mountain holly / false holly / catberry: *Ilex (Nemopanthus) mucronata*

Canadian / Shadblow serviceberry: *Amelanchier canadensis*

Chokecherry / bird cherry: *Prunus virginia*

Squashberry / Mooseberry / Pembina / Cranberry: *Viburnum edule*

Northern Wild Raisin / Witherod viburnum: *Viburnum cassinoides*

Trees

English name	Latin name	Range	Site Requirements	Conservation Value
Black Spruce	<i>Picea mariana</i>	Coast to coast	Wet sites alongside lakes, streams, and wetlands	Vegetation buffer; wildlife food, cover, and nesting sites
Paper birch	<i>Betula papyrifera</i>	Coast to coast	Full sun to partial shade; wide range of moist soils	Erosion control; vegetation buffer; wildlife food and cover
Red maple	<i>Acer rubrum</i>	MB, ON, QC, NB, NS, PEI, NL	Wide range of shoreline soils; flood tolerant	Erosion control; vegetation buffer; wildlife food and cover
Shining Willow	<i>Salix lucida</i>	SK, MB, ON, QC, NB, PEI, NS, NL	Moist to wet conditions	Erosion control; vegetation buffer; wildlife cover; food source
Balsam-fir	<i>Abies balsamea</i>	YT, AB, SK, MB, ON, QC, NB, NS, PEI, NL	Wide range of moist, rich soils; drought resistant	Vegetation buffer; wildlife food, shelter, and nesting sites
Tamarack or Larch	<i>Larix laricina</i>	YT, NWT, ON, QC, NB, NS, PEI, NL	Alongside stream banks and lake	Vegetation buffer; food and cover for shoreline birds and mammals

(“juniper” in NL)			shores; wet sites alongside wetlands	
Trembling aspen	<i>Populus tremuloides</i>	MB, ON, QC, NB, NS, PEI, NL	Full sun to partial shade; wide range of shoreline soils	Erosion control; vegetation buffer; food and cover for shoreline birds and mammals
White pine	<i>Pinus strobus</i>	YT, NWT, BC, AB, SK, MB, ON, QC, NB, NS, PEI, NL	Wide range of soils; dry sites alongside wetlands	Food and cover for shoreline birds and mammals
Yellow birch	<i>Betula alleghaniensis</i>	ON, QC, NB, NS, PEI, NL	Full sun to partial shade; moist shoreline soils	Erosion control; vegetation buffer; wildlife food and cover

Terrestrial & Aquatic Grasses

English name	Latin name	Range	Site Requirements	Conservation Value
Blue-joint Grass	<i>Calamagrostis canadensis</i>	Coast to coast	Various types of forest, taiga, and tundra including wet areas	Food for waterfowl and other animals; bank, shoreline, and soil stabilization
Clovers	<i>Trifolium</i> sp.	Coast to coast	Wet soils bordering on streams, lakes, and wetlands; full sun	Food and cover for upland birds and mammals; nectar source for pollinating insects
Dune Grass (American beachgrass)	<i>Ammophila breviligulata</i>	Eastern Canada	Shifting sand dunes, high winds, unstabilized sands with regular sand burial	Bank and shoreline stabilization; tall stands can provide shade and cover for waterfowl

Eelgrass	<i>Zostera marina</i>	Coasts	Calm waters in the sublittoral zone	Filters polluted runoff, absorbs excess nutrients; protects shorelines from erosion; habitat, protection, nursery, and food source for aquatic animals
Fescue	<i>Festuca</i> sp.	YT, NWT, BC, AB, SK, MB, ON, QC, NL	Dry to moist soils bordering on streams, lakes, and wetlands; full sun	Erosion control; vegetation buffer; food and cover for upland birds, mammals, and insects
Salt Water or Smooth Cord Grass	<i>Spartina alterniflora</i>	QC, NB, PEI, NS, NL	Shorelines with 2-45 cm water depths, mid-point between high and low tide elevation	Erosion control, soil stabilizer, food for waterfowl and other animals; tall stands provide shade and cover for waterfowl and may help prevent algal blooms
Three-Square Bulrush	<i>Scirpus americanus</i> / <i>Schoenoplectus americanus</i>	Coast to coast	Brackish areas with 0-10cm water depths	Good for saltmarsh revegetation; food for waterfowl and other animals
Wild Rye	<i>Elymus virginicus</i>	Coast to coast	Moist, well-drained soils with full sun to partial shade	Erosion control, food for waterfowl and other animals; tall stands can provide shade and cover for waterfowl and may help prevent algal blooms