

Habitat Conservation Plan for the Town of Indian Bay



January 2018

Prepared by the Newfoundland and Labrador Department of Fisheries and Land Resources in partnership with SAM (Stewardship Association of Municipalities) and the Town of Indian Bay

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Preface

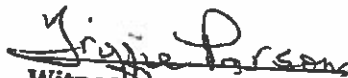
In the province of Newfoundland and Labrador some of the wildlife and wildlife habitats that are in greatest danger of being negatively impacted are those influenced by residential, commercial and industrial activities within the vicinity of municipalities. In this province, the primary focus of the Eastern Habitat Joint Venture (EHJV) is to conserve valuable wildlife habitat through Stewardship Agreements. The Town of Indian Bay was identified as having just such ecologically valuable, and unique, habitat located within its Municipal Planning Area.

The Town of Indian Bay signed a stewardship agreement with the provincial government in August 2016 where both parties pledged their commitment to conservation and protection of habitat within designated land areas known as Management Units as well as promoting wise use of other wildlife habitat within the vicinity of the Town. In accordance with this agreement, Indian Bay manages this area with technical advice provided by the provincial Wildlife Division, in part via this Habitat Conservation Plan. With the signing of this plan, the agreement parties officially accept this Habitat Conservation Plan and agree to use it as a guide to govern activities within the Management Unit.

The following signatories agree to work towards the implementation of the following *Habitat Conservation Plan* for the Town of Indian Bay:



Mayor



Witness

May 1/18
Date

May 01, 2018
Date



**Department of Fisheries and Land Resources
Government of Newfoundland and Labrador**

May 2/2018
Date

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Section 1: Plan Overview

Stewardship Agreement Goals

- (1) To conserve habitat located within the designated Management Unit and to positively influence habitat uses.
- (2) To maintain and/or increase wildlife use of those areas, particularly by waterfowl, shorebirds, and other bird species.
- (3) To increase public awareness of the importance of wetland habitats for conserving waterfowl, shorebirds and other wildlife.

Plan Purpose

The Town of Indian Bay will use this Habitat Conservation Plan as a guide to govern activities which impact wildlife habitat, wetlands, and waterfowl/shorebirds to minimize negative impacts within the areas designated for conservation.

Plan Objectives

- (1) To present an assessment of the wetland habitats and wildlife species designated for conservation.
- (2) To recommend protection, conservation, and enhancement strategies.
- (3) To describe potential initiatives for education and awareness among the public to increase support and cooperation of citizens of the Town of Indian Bay.

Section 2: Habitat Conservation in Newfoundland and Labrador

Introduction

Human development has resulted in the destruction or alteration of many types of habitat all over the world. 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 is due to the loss of natural habitats to urban, industrial and agricultural expansion. Wetlands are among the areas most affected by this development and are 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. Healthy wetlands are some of the most biologically diverse and productive ecosystems on earth and play a major role in ecosystem health.

Wetlands serve as important buffers to flooding, function as sinks for carbon and as natural reservoirs for holding, purifying, and recharging water. From an economic stance, wetlands are associated with recreational and subsistence opportunities for hunting, fishing, trapping for food and fur, berry picking, and for non-extractive activities like wildlife viewing, ecotourism, paddling, sports, and hiking. Wetlands also provide for the seasonal requirements of many waterfowl and serve as important habitat throughout breeding, feeding, staging and over-wintering. All migratory waterfowl, many other birds, and half of all threatened and endangered species depend on wetlands and associated upland habitat for their existence.

Recognizing the importance of wetland conservation, in 1986 Canada and the United States (later followed by Mexico) signed the North American Waterfowl Management Plan (NAWMP, nawmp.wetlandnetwork.ca). This committed these countries to a long-term partnership to protect wetland habitats. 24 joint ventures, ranging from species to regional-specificity, have been established to achieve the objectives of NAWMP. The province of Newfoundland and Labrador (NL) became a partner of the Eastern Habitat Joint Venture (EHJV) in 1989.

Eastern Habitat Joint Venture (EHJV)

The EHJV (ehjv.ca) conserves, enhances, and restores wildlife habitat for birds, especially wetlands, in the six eastern Canadian provinces of Ontario, Quebec, New Brunswick, Nova Scotia, PEI, and NL. 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 NL, the program is administered by the provincial Department of Fisheries and Land Resources and Stewardship Association of Municipalities (SAM). Other local contributors include Ducks Unlimited Canada, Canadian Wildlife Service (a branch of Environment and Climate Change Canada), and Nature Conservancy of Canada.

NL Municipal Habitat Stewardship Program

In NL development occurs most regularly within municipal boundaries. Wildlife habitat within municipalities is often at the greatest risk of destruction and potentially in greatest need of conservation and/or management. As its primary contribution to the EHJV in NL, the provincial Department of Fisheries and Land Resources works with municipal councils to conserve significant wildlife habitat, especially wetlands, within planning area boundaries. The program's goal is to help make municipalities more aware of the value of 'their' wildlife and habitat and to empower them to conserve specific areas. This helps lead to more informed development decision-making and minimizes negative impacts on wildlife and ecosystems. A Stewardship Agreement is a formal public commitment by a municipality and the province, to act together to conserve specific habitat for wildlife. By signing a Stewardship Agreement, municipalities become an important link in a continental chain of conservation areas. Over 40 municipalities have signed Habitat Stewardship Agreements in NL (Figure 1).



Figure 1. Map of Habitat Stewardship Agreements signed in Newfoundland and Labrador

Roles of Stewardship Agreement Signatories

After the Habitat Stewardship agreement is signed (Indian Bay agreement shown in Appendix 1), a Habitat Conservation Plan (this plan) is prepared in consultation with the community. The plan offers recommendations and advice for conserving, enhancing and/or managing the wildlife habitat. 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 activities will not have negative impacts.

The Province: The Minister signed on behalf of the province. The provincial Department of Fisheries and Land Resources administers the Eastern Habitat Joint Venture in Newfoundland and Labrador and works closely with SAM (Stewardship Association of Municipalities) on its implementation.

Now that the Stewardship Agreement has been signed, staff of the Department are expected to:

- Write a Habitat Conservation Plan in consultation with the Town (this plan)
- Review any proposed developments within the Management Units that may impact that wildlife habitat
- Support the town and local groups in implementing the Stewardship Agreement and Habitat Conservation Plan.
 - Assisting the Town in carrying out, where appropriate, education to raise awareness of wildlife and habitat conservation (such as those discussed in Section 5).
 - Assisting the town in restoring or enhancing wildlife habitat (discussed in Section 5).
 - Such activities are often carried out in partnership with the agencies of the NL Eastern Habitat Joint Venture.

The Town: Now that the Stewardship Agreement has been signed, the Town of Indian Bay and its designated Mayor and Council are expected to:

- Ensure that the wildlife habitat areas (“Management Units”) are protected from destruction or degradation
- **Contact EHJV program manager at the Wildlife Division within 30 days** (709 637 2013) when activities are proposed that may impact that habitat
- Incorporate the Stewardship Agreement and Habitat Conservation Plan into the next Municipal Plan draft or revision
- Educate residents, staff 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 with the assistance of the EHJV partners
- Participate in SAM (Stewardship Association of Municipalities)

Section 3: Wildlife and Wildlife Habitat in Indian Bay

Indian Bay Management Unit

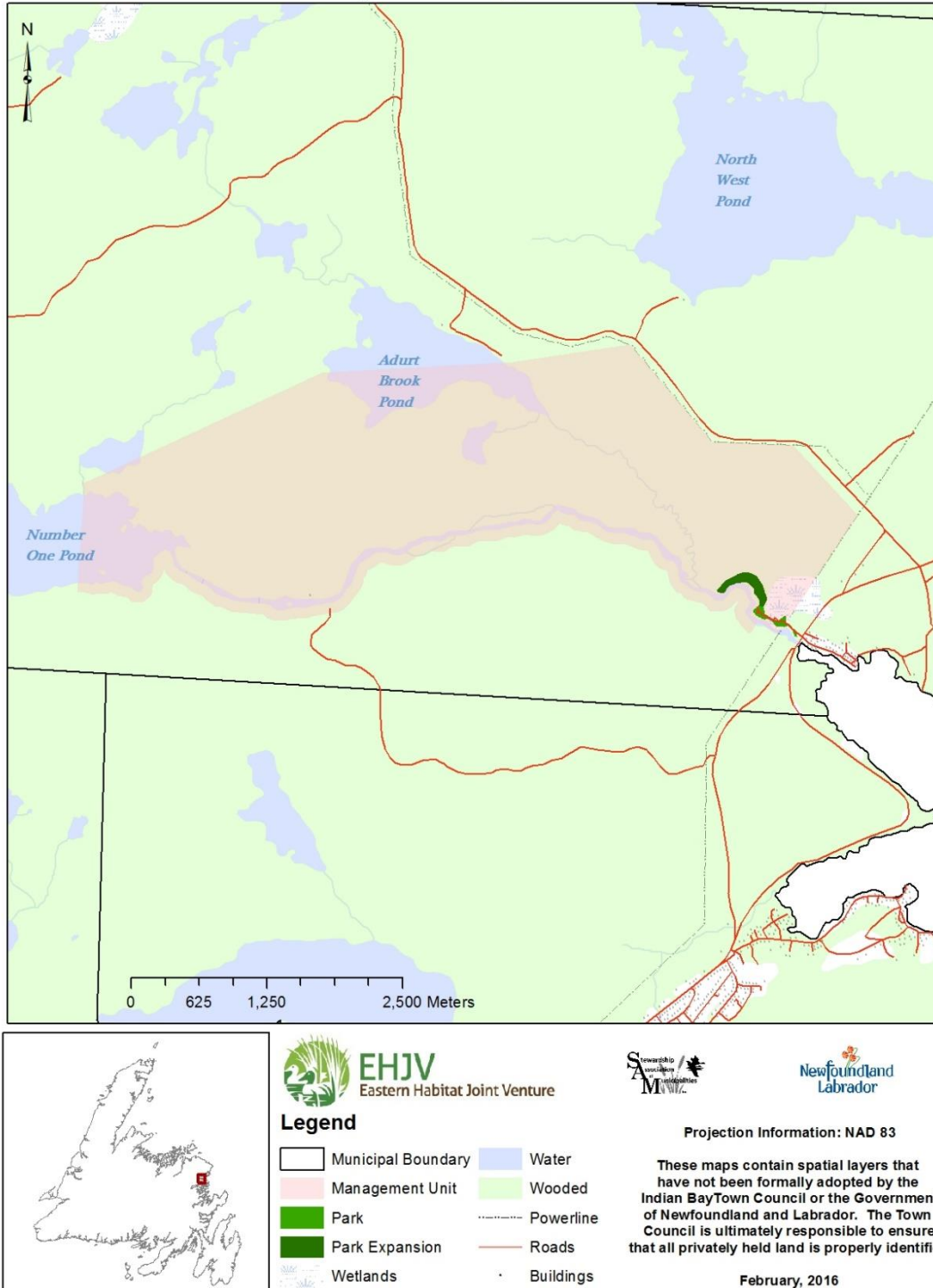


Figure 2. Map of the Indian Bay Brook Management Unit Management Unit is shown in transparent pink

Indian Bay is located north of Gambo along Highway 320 (Road to the Shore) and north of the Town of Centreville-Wareham-Trinity, south of the Town of New-Wes-Valley. The population is 175 (2016 Census). In 2010, important wildlife habitat was found within the municipal planning area of the Town of Indian Bay. Wetlands within the municipality form individual links of waterfowl migration routes for a wide variety of both wetland and upland bird species. There is ideal habitat for songbirds, mammals, and fish within the town's planning area. The one Management Unit in Indian Bay (Indian Bay Brook Management Unit; Figure 2) encompasses 2877 hectares (1164 acres).

The Indian Bay Brook Management Unit (Figure 2) is bounded by the powerline in the southeast, and parallels the south side of Indian Bay Brook at a buffer distance of approximately 100 meters to a point on Number One Pond. The Management Unit includes the easternmost portion of Number One Pond, and extends from its northern bank to include the southernmost portion of Adurt Brook Pond. From the eastern shore of Adurt Brook Pond, south of a small access road, the boundary continues to the southeast to terminate at the powerline. The Management Unit excludes privately held land on the southern bank of Indian Bay Brook adjoining the powerline, and also excludes a municipal park and adjoining lands designated for a possible park expansion.

Indian Bay Brook is in the Northcentral Subregion of the Central Newfoundland Forest. Indian Bay Brook has a rich and diverse ecosystem, consisting of Black Spruce (*Picea mariana*), White Spruce (*Picea glauca*) and Balsam Fir (*Abies balsamea*) stands with scattered hardwoods, such as Trembling Aspen (*Populus tremuloides*), White Birch (*Betula papyrifera*), and Mountain Alder (*Alnus incana*) thickets.



Vegetative habitat in the area, such as overhanging shrubs, grasses, sedges and ferns including Sweet Gale (*Myrica gale*), Choke-cherry (*Prunus virginiana*), Meadow Rue (*Thalictrum dasycarpum*), Serviceberries (*Amelanchier laevis*), Swamp Horsetail (*Equisetum fluviatile*) and Northern Long Sedge (*Carex folliculata*) all provide food and shelter to the many diverse species found throughout Indian Bay.

Indian Bay Brook is well known for its populations of Brook Trout (*Salvelinus fontinalis*) and is one of the best fishing areas on the island. Banded Killifish (*Fundulus diaphanus*), a vulnerable species in Newfoundland, is also found. Butterflies, such as the Mourning Cloak (*Nymphalis antiopa*) and the White Admiral (*Limenitis arthemis*) and mammals such as Moose (*Alces alces*), Black Bear (*Ursus americanus*), Beaver (*Castor canadensis*), Coyote (*Canis latrans*), Snowshoe Hare (*Lepus americanus*), Mink (*Neovison vison*) and Otter (*Lutra canadensis*) are also seen.

Songbirds include Boreal (*Poecile hudsonica*) and Black-capped Chickadee (*Poecile atricapilla*), Blue Jay (*Cyanocitta cristata*), Gray Jay (*Perisoreus canadensis*), American Robin (*Turdus migratorius*), Blackpoll Warbler (*Dendroica striata*), Tennessee Warbler (*Vermivora peregrina*), Wilson's Warbler (*Wilsonia pusilla*), Black and White Warbler (*Mniotilta varia*), White-throated Sparrow (*Zonotrichia albicollis*), Common Redpoll (*Carduelis flammea*), Gray-cheeked Thrush (*Catharus minimus*) and Hermit Thrush (*Catharus guttatus*).

Birds of prey are also quite abundant including Bald Eagle (*Haliaeetus leucocephalus*), Osprey (*Pandion haliaetus*) and the Great Horned Owl (*Bubo virginianus*). Waterfowl species are also quite common as there are extensive nesting, feeding and staging habitats in the area. Some common species include Canada Geese (*Branta canadensis*), American Black Duck (*Anas rubripes*), Common Goldeneye (*Bucephala clangula*), Common Mergansers (*Mergus merganser*), Wood Duck (*Aix sponsa*) and Ring-necked Duck (*Aythya collaris*).

Existing Land Use and Its Potential Impact on Wetlands and Wildlife

Private land inside the Management Unit

There is one known parcel of issued Crown land inside this Management Unit (the municipal park). This is Title Number 68990, Volume Number 330, Folio Number 132, Document Number 10039072. The Original Title Owner of this parcel is the Town of Indian Bay (Land Use Atlas, accessed Jan 2018). By signing this Habitat Stewardship Agreement, the Town commits to retaining this land, so that it can be appropriately zoned for conservation.

Domestic Wood Cutting

The western edge of the Management Unit includes a portion of Domestic Cutting Area 40 established by the Department of Fisheries and Land Resources (Gambo District Office, 709 674 4625).

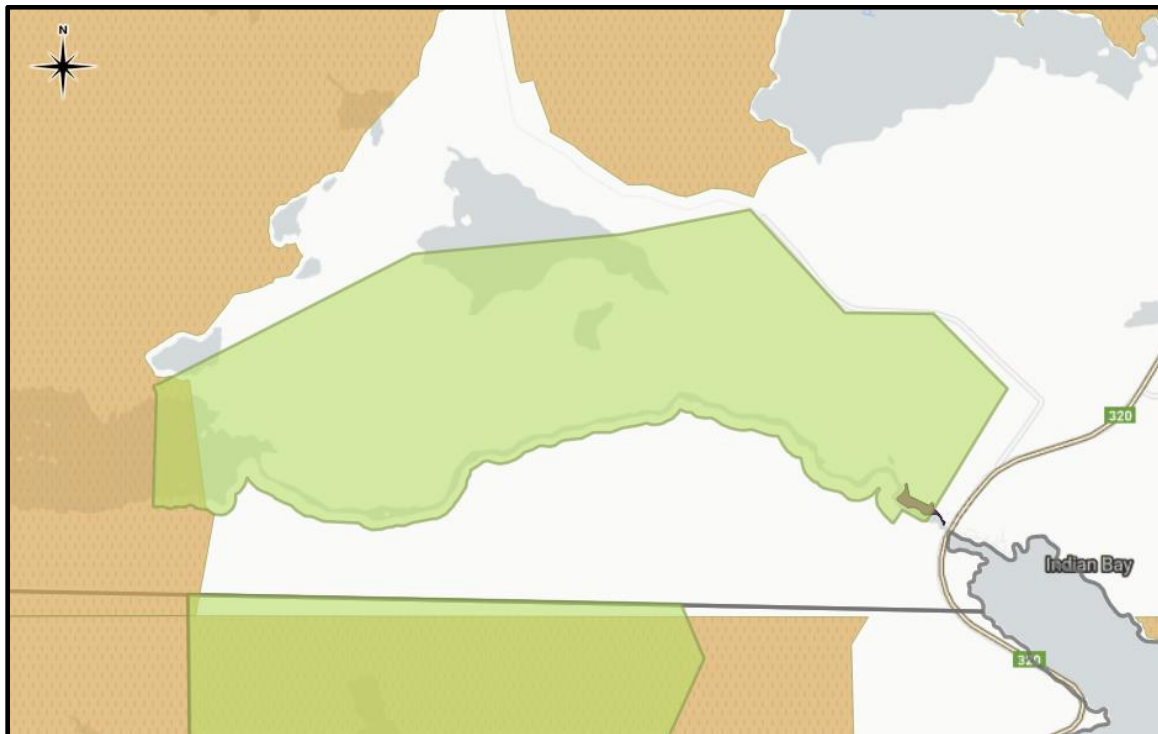


Figure 3. Map of private land and cutting area inside the Management Unit

The parcel of land granted to the Town of Indian Bay can be seen in purple at the eastern edge of the Management Unit; Domestic Cutting Area 40 can be seen in patterned brown at the western edge of the Management Unit.

Residential/Commercial Development

Residential development in the area surrounding the Management Unit is minor. Developments should be treated with caution to reduce impacts on wildlife and to limit habitat loss. Any possible future development (such as trails) inside the Indian Bay Brook Management Unit must be referred to the EHJV program at the Wildlife Division for comment (709 637 2013) to make sure it is reviewed from a wildlife habitat perspective.

Fishing

Many lakes and rivers in and around Indian Bay support healthy populations of trout, salmon, and other fish. Both resident and visiting anglers should be reminded that waterfowl are easily disturbed during the nesting and brood rearing period (May to mid-June). Broods are very susceptible to predation when left unattended and during the nesting period adult waterfowl will often abandon their nest if disturbed. If docks or other structures are being constructed, nesting sites should be avoided.

Tourism & Recreation

Recreational and tourism opportunities can help raise awareness and educate visitors and residents about waterfowl within the community and the importance of wetlands. Hiking, walking, birdwatching, cross-country skiing, snowshoeing, and geocaching are popular activities in many Management Units across the province. Other activities such as photography and paddling (canoeing and kayaking) could be further encouraged in Indian Bay as low-impact, healthy recreation opportunities for both residents and visitors.

Restoration Projects

The Indian Bay Brook Management Unit is already home to an IBEC restoration project (Figure 4) funded through the NWCF (National Wetland Conservation Fund). This project aimed to restore habitat in seven sub-project areas which had been degraded by human and natural causes. Benefits will be measured by the number of invasive plants removed, number of native plants planted, and the regrowth of native vegetation in these areas. The results of this project (set to end in 2018) will be interesting to share with other municipalities in the province who may want to take on similar projects inside or near Management Units.

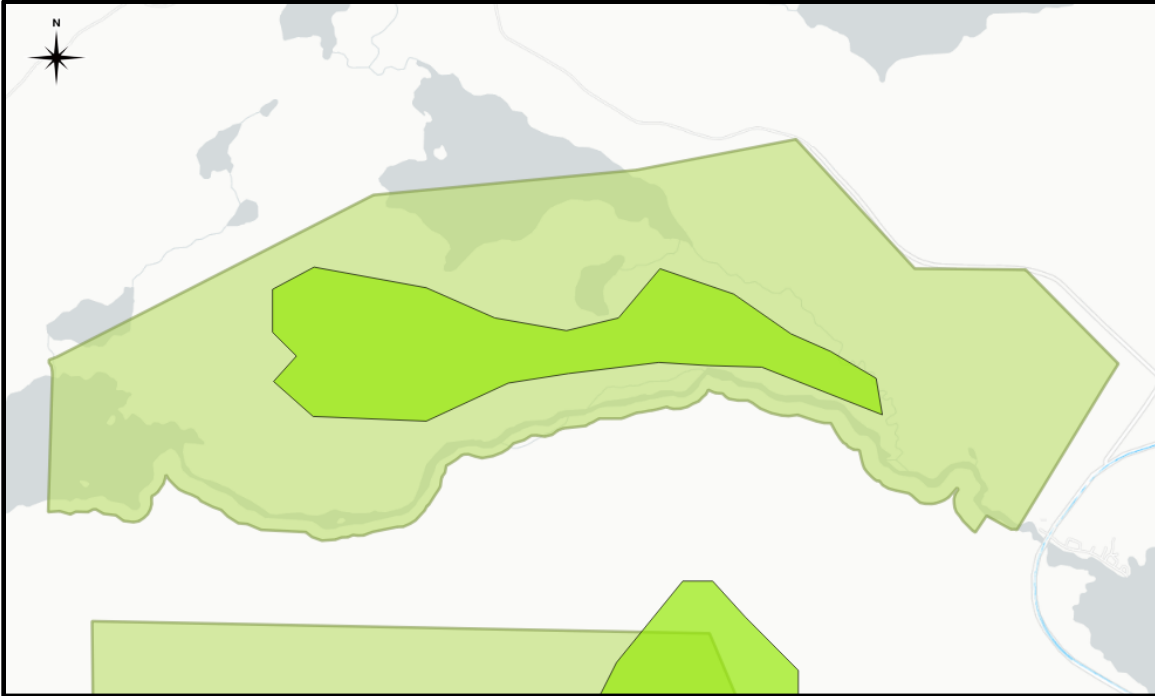


Figure 4. Map of the IBEC wetland restoration sub-project area
The sub-project area can be seen as the bright green irregular shape inside the Management Unit.

Section 4: Policies for Habitat Conservation

1. Incorporate your Management Units in your Municipal Plan

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

2. Refer all possible developments to the Wildlife Division

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, **Council will consult with the EHJV program manager (709 637 2013) at the Wildlife Division,** Department of Fisheries and Land Resources. Activities within the Management Units will be permitted if they do not result in the loss of wildlife habitat or wildlife populations. Conservation will be at the forefront of management decisions.

3. Keep riparian buffer areas

Riparian buffers are strips of untouched land occurring between upland areas and wetlands, lakes, rivers, ponds, and streams. They are composed of trees, shrubs, grasses, cattails, and sedges and provide for a high level of wildlife use, 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 roots, helping to build stream banks and prevent erosion and help control flood levels.

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.

Restoration projects (such as the NWCF project that IBEC has completed) can rebuild riparian areas; **Appendix 4** provides suggestions for possible plant species to be used, and Section 5 contains contact information professionals with experience in environmental restoration.

The province, via the provincial Lands Act – Section 7(1), requires a crown land reserve or easement of 15 metres along all water bodies greater than 1 metre in width and the maintenance of permanent riparian areas next to all watercourses. It is important that the town ensures awareness and adherence to this crown land reserve designation by all 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, ATVs, and cabin development can cause disturbance to riparian vegetation.

4. Minimize All-Terrain Vehicle (ATV) Use

ATV users want to enjoy beautiful landscapes and a healthy outdoors. Increasingly, ATV riders know they play an important role in maintaining these landscapes so everyone can enjoy them. Many riders take care to avoid unnecessarily damaging the outdoors. ATV use which is minimized to conform to the terms of the All-Terrain Vehicle Use Regulations (1994) will help to keep the important habitats in Indian Bay intact, healthy, and productive. This includes using established trails, not crossing over wetlands and bogs unnecessarily, and crossing streams at designated points. SAM can provide to you free brochures called “Fish Habitat and All-Terrain Vehicles, Newfoundland and Labrador” which can help explain best practices to reduce habitat damage. These could be provided to local community groups, at festivals, and kept at the town hall as a free resource for all.

In cases where ATV use which is damaging habitat, provincial Department of Fisheries and Land Resources Conservation Officers can enforce the Motorized Snow Vehicles and All-Terrain Vehicles Act/Regulations and can charge ATV users for habitat damage under this Act.

5. Understand Fish and Wildlife Enforcement

Management Units do not affect hunting, trapping, or fishing rights, such that where hunting, trapping, and/or fishing are safe and legal in a certain area, they will remain that way after a Management Unit is designated. However, many municipalities are (rightly) concerned about hunting and fishing activities that fall outside what is safe or legal (whether or not they are within a Management Unit).

Fish and Wildlife Enforcement Officers can also enforce the above regulations and can be contacted 24/7 at 1 877- 820- 0999. However, they are also able to deal with

a wide variety of other wildlife-related enforcement issues and are a good contact for poaching issues, hunting in inappropriate areas, and all types of illegal hunting. For more information, your closest office in Gander (50 McCurdy Drive) can be contacted at 709 256 1293.

For enforcement officers to fully understand the problem and to be able to pursue a case, it is helpful to provide a complete picture of the problem, with specific details. Without these details, it can be difficult for enforcement officers to properly follow up. **Appendix 2** provides a form that can serve as a template for reporting possible wildlife enforcement issues. It can be used by Council or by residents, provided in printed copies to residents at meetings and events, or kept at the Town Hall for easy access. Developed with provincial wildlife enforcement officers, this form may help your Council or your residents to record information about possible problems with wildlife or habitat.

Enforcing regulations such as these can be complicated, especially where federal/provincial jurisdiction overlaps, and different species are covered by different laws. Partnering with provincial enforcement officers to ensure accuracy, SAM has produced a guide about conservation enforcement issues which can be found at samnl.org/enforcement.

6. Participate in SAM

When a municipality signs a Municipal Habitat Stewardship Agreement with the province, it becomes a member of the Stewardship Association of Municipalities, also known as SAM (samnl.org). SAM is an incorporated, non-profit organization whose member municipalities together secure, enhance and restore important wildlife habitat and represents its members on issues related to wildlife conservation. SAM maintains a public page about your agreement at samnl.org/indian-bay featuring maps, photos, facts, and information on local attractions. Please link to this page from your town's website and from the IBEC website; this will help increase residents' knowledge and understanding of the agreement and program.

SAM meets each spring (May or June) and fall (September or October) with host municipalities rotating among members and regions. Please identify a representative of your town (mayor, councillor, staff, or involved resident) to attend at least one of these meetings per year. If someone from your Town is not available, perhaps a staff or board member from IBEC can attend to represent Indian Bay. This will connect your town to like-minded municipalities and link you to resources and training. You may also be interested in co-hosting a SAM meeting in the Town of Indian Bay in conjunction with other SAM municipalities; many municipalities enjoy this for the exposure it provides for their wildlife habitat and associated projects.

Section 5: Habitat Conservation and Education Strategies

The following section presents ideas for community education, engagement, and habitat enhancement that could be implemented over time in and around Management Units and provide recreational benefits. Community engagement and partnerships are the true strengths of any stewardship agreement; the Town of Indian Bay is fortunate to already have IBEC (Indian Bay Ecosystem Corporation; **indianbayecosystem.com**) working in your area. IBEC is “a non-profit community organization with the goal of protecting the Indian Bay watershed through research, community engagement, and sound stewardship”. These goals align well with the aims of your stewardship agreement, and your Management Unit is within their work area. IBEC is already engaged in important habitat restoration work as well as land use planning activities, as well as reaching hundreds of residents and students through their educational programs and workshops. We encourage council to engage with IBEC and other organizations like SAM to carry out activities which meet your needs and interests.

Wetland habitats are often ideally suited to recreational activities, including fishing, hiking, canoeing, photography and bird-watching. The Town of Indian Bay may wish to use these opportunities to increase tourism to the region; interpretive signs can help both residents and tourists connect with the area. In developing employment, recreational and tourism opportunities, careful consideration for wildlife must be included in the planning process. Otherwise, human activities may result in negative impacts to the resource that provides the attraction.

One important benefit that people receive from stewardship is the opportunity to increase their knowledge of nature. Many of these projects can be easily conducted by local groups, allowing hands-on involvement in conservation efforts. 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.

Grants and Funding

Many of these activities and programs are free or can be funded through small community grants and via partnerships. SAM provides a regularly updated listing of many relevant grants at **samnl.org/funding-opportunities**.

Large grant applications may take several months to prepare if committees are involved. Allow enough time to apply for these grants and to obtain the letters of support that local partners such as SAM or the Department of Fisheries and Land Resources may provide; keep an eye on deadlines as they approach.

Local partnerships

IBEC is likely to be an appropriate partner on projects discussed in this Habitat Conservation Plan. Sharing a CCNL Green Team with neighbouring towns might be something to discuss as well, especially if other towns are beginning environmental projects as well. The nearby Town of Centreville-Wareham-Trinity and New-Wes-Valley are active SAM members as well; they are familiar with the Indian Bay agreement and might be interested in future regional collaborations. There is also a local Ducks Unlimited Canada chapter covering Bonavista North. As one of the EHJV partners, Ducks Unlimited Canada is often an excellent partner for education and restoration projects in towns with habitat stewardship agreements; they can be contacted at du_newfoundland@ducks.ca or 709 237 DUCK. The Coastal Restoration Fund (dfo-mpo.gc.ca/oceans/crf-frc/index-eng.html) might be a suitable grant to be explored in partnership IBEC and/or SAM and could be discussed with the Conservation Biologist at SAM (samconservation@gmail.com).

Trails, Interpretive Signage 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 help residents and visitors strengthen their connection to nature, especially where interpretive signage is used to help point out interesting landscape and wildlife.

Geocaches (small containers found via GPS; **geocaching.com** and various mobile apps such as **c:geo**) can be added alongside trails as well to provide a fun and 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.

Approximately 5 geocaches already exist in the Town of Indian Bay with another ~30 in the surrounding region, making this area an active one for geocachers. SAM and the EHJV partnership (username EHJV_Stewardship) currently maintain 32 geocaches in SAM municipalities across the province. After creating a geocaching account (or logging in first), the full list can be found at **geocaching.com/seek/nearest.aspx?u=EHJV_Stewardship**. A geocache has already been given to IBEC for placement in the Town of Indian Bay; IBEC will install it on the Indian Bay road sign in Spring 2018.

As part of the stewardship agreement, the Town of Indian Bay has been provided with one large highway road sign, and smaller interpretive signs are possible in the future (Figure 5). These can be placed at locations of your choosing, and could be chosen to highlight trail locations. Additional interpretive signage could possibly be

funded through grants to the Town of Indian Bay; for example the TD Friends of the Environment Foundation funds trail and park projects (see funding opportunities link above for other possibilities)

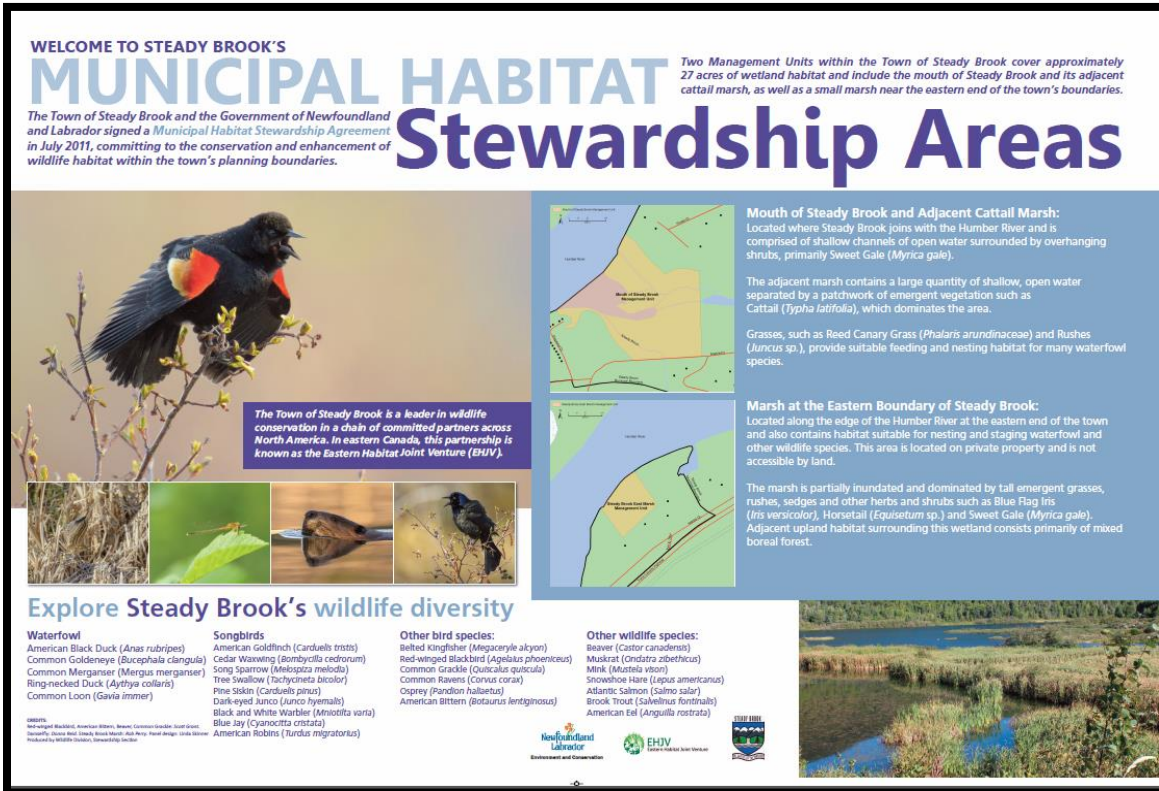


Figure 5. Example of the SAM interpretive sign
 This interpretive sign measures 2 x 3 feet and can be provided to interested SAM municipalities as time and funding allow.

Wildlife Watching

Local groups and interested volunteers can watch and monitor birds, plants, and wildlife in all areas of the Town but, particularly, within Management Units. Data collection can provide information on changes that are occurring within a wetland or other area and can indicate problems or progress. By involving residents, the profile of the area is enhanced to the long-term benefit of conservation. A variety of programs and apps are available for wildlife monitoring; iNaturalist and ebird are two of the best.

When entering data, there is no need to guess the species - it is 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.

iNaturalist is an especially good smartphone app for those interested in learning to identify plants, butterflies and other insects, other invertebrates, birds, fungi, and mammals. It has a neat feature where other experts will identify your sightings for you! You can snap a quick photo of a plant and it will often be identified within 24 hours. This can be used to build plant and wildlife lists of your management unit, as a learning tool, for school students, and for fun. Make sure to turn your location services on so that your sighting can be found on the map and so others can help with your identifications.

ebird.org is a free, easy-to-use website and app to record your sightings and provide valuable information to help us gain a better understanding about our birds. It is already being used to record the birds across NL and is popular with visitors. In NL in 2016, over 280 species of bird were recorded on ebird.org and over 11,000 individual lists were submitted!

Explore all bird sightings in Newfoundland and Labrador (click map to zoom to your area) at ebird.org/ebird/canada/subnational1/CA-NL?yr=all

Start contributing to eBird at secure.birds.cornell.edu/cassso/account/create

You'll need:

- Field notebook & pencil (and/or app)
- Phone (for safety, recording start and end times, and/or using an app)
- Bird field guide
- Binoculars and/or a spotting scope
- Appropriate outdoor clothing

Be mindful of tides and wetland (damp, soft, slippery) habitat, making safety your top priority. Common sense is important; aim to cause as little stress and disturbance as possible to birds and other animals.

Conservation Corps Green Teams

Conservation Corps Newfoundland and Labrador (**ccnl.ca**) has a variety of interesting program for staffing, some of which can be funded by corporations and be of no cost to your organization. Summer Green Teams and Interns, which are post-secondary and high school students or recent graduates, can work within communities on environmental projects. Communities with Stewardship Agreements have often applied for and received Green Teams. Examples of potential projects could include nest boxes, bird houses, bird monitoring, trail maintenance, community outreach, wildlife surveys, and developing field guides. Green Team members could help train local high school students or community members in monitoring and could develop educational material designed to raise awareness for

conservation and stewardship initiatives. Interns can work on a wide variety of environmental education, project coordination, and outreach initiatives.

Artificial Nesting and Loafing Structures

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 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 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. Take care to prevent the use of toxic construction materials (e.g. treated wood, contaminated soils) and disturbance to plant and animal communities.

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. Annual removal and reinstallation of islands may be necessary in response to ice conditions in tidal areas.

Cavity Nesting Waterfowl

Cavity nesters such as the Common Goldeneye (also known as pie duck or whistler, *Bucephala clangula*) use abandoned woodpecker holes or natural tree cavities caused by disease, fire or lightning. In the absence of these natural cavities, they will also use constructed nest boxes; Indian Bay and the surrounding area are already home to many of these boxes. Boxes need to be placed correctly; the guide at samnl.org/nest-boxes will help you get started and printed laminated books and brochures from Ducks Unlimited Canada are also available to help you; contact du_newfoundland@ducks.ca with any questions.

Roosting and nesting structures for other species

There are a variety of roosting and nest structures (**Appendix 3**) 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 6). The increase in tree swallow population that may occur with these boxes can prove beneficial in that many bird species (as well as bats) feed on insects and may serve as natural pest control. In addition, providing structures for predatory birds may also help reduce (or keep in check) populations of birds that may not be desirable [e.g. American Crow (*Corvus brachyrhynchos*), European Starling (*Sturnus vulgaris*)] and rodents such as mice while increasing biodiversity.

Installing nest boxes and roosting structures is a very exciting activity to help enhance wildlife in areas around your community. It does, however, take time, commitment and maintenance.



**Figure 6. Bat Box in Pynn's Brook, Western Newfoundland
Photo by 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 5) 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 excellent 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), and *Project Webfoot* (Ducks Unlimited Canada, ducks.ca). Canadian Wildlife Federation's *Project Wild* can foster an increased environmental ethic in youth and adults alike. Many night programs also exist that would be appropriate for guide and scout groups.

Backyard Habitat for Canada's Wildlife

This initiative from the Canadian Wildlife Federation (cwf-fcf.org) is administered in conjunction with the Wildlife Division's Salmonier Nature Park (contact Ralph Jarvis at **709 229 7888** or ralphjarvis@gov.nl.ca for more information). The program enables you to help wildlife by offering immediate, specific, and inexpensive suggestions on how to make life better for wildlife and often includes a bird nesting box workshop as well.

Nature and Art

Some stewardship communities have used the wetlands and associated wildlife 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 use the open-air concept to show nature-related programs outdoors in the evenings. Content could be tailored to various ages and could include nature-related craft projects as a follow up. Good starting

points for nature projects for children include **hookedonnature.org**, **planetpals.com**, and **hctfeducation.ca/resource-room**

Hunter Workshops

A municipality may be able to partner with a local rod and gun club, the Department of Fisheries and Land Resources (Wildlife Division) and other partners to participate in hosting a *Youth Hunter Skills Workshop*. Perhaps the Gander Rod and Gun Club (**ganderrodandgun.org**) would be willing to partner for some of these events. These events are usually co-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 twice per year through the Wildlife Division in locations on both the east and west of the Island of Newfoundland; the current contact is Debbie Howell at Salmonier Nature Park (**howelld@gov.nl.ca** or **709 229 7888**).

Ducks Unlimited Canada's Youth Programs

Project Webfoot

Educating youth about wetlands and waterfowl is a major part of Ducks Unlimited Canada's mission. IBEC is already a partner on the award-winning *Project Webfoot Wetland Education Program* (**ducks.ca/initiatives/project-webfoot**). 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. Contact the NL Conservation Programs Specialist at **du_newfoundland@ducks.ca** or **709 237 DUCK** for more information.

Wetland Heroes

Another program offered through Ducks Unlimited Canada includes *Wetland Heroes* (**ducks.ca/initiatives/wetland-heroes**) which improve and protect wetlands for wildlife and people in their local community. To become an official Wetland Hero, register at **ducks.ca** and describe the great conservation work that is being done to help protect wetlands in your community. Wetland Heroes receive a certificate and a special token of appreciation from Ducks Unlimited Canada. With permission, selected Wetland Heroes may be featured online and/or in print, and some Wetland Heroes may receive \$500 Awards of Merit.

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 Indian Bay. On that page, we also have a **Guide to delivering interpretive hikes** which can assist you. The list of species found on page 11-12 are also a helpful resource for you. These could be used to create a small brochure that represents a 'bird checklist' or wildlife list of the Indian Bay area, or used as the basis for field guides for the area which could be developed by a Green Team, high school, IBEC, or a relevant committee.

Adults often enjoy using birdwatching towers or blinds (Figures 7-9) as well; these could be fun community building projects or completed with the help of a Green Team, committee, or volunteers. Corduroy Brook Enhancement Association (corduroybrook.org) in the Town of Grand Falls-Windsor has experience with these kinds of projects and would be a good contact as would the Town of Winterland, whose projects are featured below.



Figure 7. A wooden bird viewing tower
Photo from Creative Commons



Figure 8. Enclosed bird blind with mural in Winterland NL.
Photo by Wildlife Division



Figure 9. Viewing deck in Winterland, NL
Photo by Wildlife Division

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 on the Island of Newfoundland, and should not be introduced into the environment without considering potential consequences, including the possibility of invasive plants out-competing native plant species. **Appendix 4** provides a helpful guide to plant species for restoration projects.

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. 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 non-native, species can alter the balance within the ecosystem and have negative effects upon the natural populations within the region and the ecosystem.

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. Nuthatch Nursery in Lethbridge NL (709 467 1309) also specializes in native plants. 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 in newsletters and at meetings. The NWCF project through IBEC is also of interest to SAM members and could perhaps be showcased at a future SAM meeting as well.

Litter Removal

Community groups and residents can work cooperatively to remove litter in and around the community on a regular basis. It is important to avoid locations where waterfowl may be disturbed during breeding, staging or brood rearing periods (generally 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, and a full comprehensive guide to how to host your first litter cleanup is at shorelinecleanup.ca/sites/default/files/gcscstaff/SC_Guide_EN.pdf

To increase public participation in your cleanup, try directly inviting other local groups like your 50+ club, trail clubs, local business owners, your closest Ducks Unlimited Canada chapter, or the snowmobile federation. 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. Many radio stations 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 which can be searched by area. MMSB also provides community grants to municipalities to help with waste reduction and illegal dumping; more info on their municipal programs is at mmsb.nl.ca/partners/municipalities

A WWF Go Wild Grant might be able to fund a cleanup in the Indian Bay Brook; more info is at wwf.ca/takeaction/gowild. Other possible sources of funding for cleanup projects could be Newfoundland Power's Environmental Commitment Program or their Envirofest (newfoundlandpower.com/About-Us/Environment/Community-Initiatives), or the TD Friends of the Environment grant (fef.td.com/funding). All of these grants support green space, park restoration, and/or cleanups. Newfoundland Power's Envirofest grant specifically mentions community cleanups and projects are encouraged to take place during Environment Week in June.

Reducing Litter

It's hard to reduce litter, but there are some good ideas out there that might work in the Town of Indian Bay. The following ideas are adapted from "A Guide to Reducing and Managing Litter, 2015" as well as research papers by Schultz et al. and Bator et al.

- Make garbage cans available, convenient, and easy to use. (More people will do the right thing when it is made easier)

Reason: More people litter when garbage cans are farther away. Areas that have added enough garbage cans have seen reductions in litter in a short period of time.

- Host, or pay for, consistent, ongoing cleanups. Stick to a consistent, written, well-known schedule, such as the 1st of every month (or the 1st of every week) in problem areas (because then you can stay on top of the problem and generate awareness)

Reason: Obviously cleaned areas have lowering littering rates, because a clean setting sends the specific message that not littering is the expected, normal behaviour

- Don't let litter accumulate. Have a plan in place for who will deal with unexpected litter that appears 'off-schedule' (see above). Do not rely on individual citizens to report litter; have staff or community groups scan areas frequently.

Reason: Litter attracts more litter. People are more likely to litter in areas that already have litter

- Use landscaping, gardening, and beautification in problem areas

Reason: People litter less in areas that appear to be well taken care of

- Use positive messages (such as "Do your part", "Help keep your town/Indian Bay beautiful") rather than negative messages (such as "Don't litter").

Reason: *Positive messages have usually (but not always) been shown to be more effective than negative messages. One study conducted with university students even found that a sign saying “Please don’t litter” actually increased litter!*

- Have a community campaign. Offer a small prize or a gift card to the school student who designs the best anti-litter poster. This could be use for a school art or English language project in local schools.

Reason: *Help young people (who often contribute to litter problems, see above) feel pride in their community and become directly involved in the problem.*

- Suggest a solution. If garbage cans can’t be in every area, tell people directly how they can reduce litter (for example, “Take your garbage with you”, “Put it in your pocket”, “Take your garbage home” or “keep a garbage bag in your car...don’t throw it out the window” etc.)

Reason: *Many people will do the right thing when they understand it is strongly desirable and when presented with tips or options. Messaging such as this can suggest that the community is aware of the problem and monitoring it – they’re watching out for litter!*

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**, our newsletter, and our social media, where additional resources are added regularly – and we’ll hopefully see you at the SAM conferences each year. Remember, community involvement is the true strength of a Stewardship Agreement!

Appendix 1: Indian Bay Municipal Stewardship Agreement

Page - 1 - of 5

MUNICIPAL STEWARDSHIP AGREEMENT

THIS AGREEMENT made at Indian Bay, in the province of Newfoundland and Labrador, this 30th day of August, 2016.

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 INDIAN BAY**,
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 coastal, wetland and upland habitats are fundamental tools in maintaining and enhancing the wildlife populations, particularly birds, in the province;

AND WHEREAS the Minister proposed that certain important 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 land, or on the wildlife which utilize those areas.
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 land, and the wildlife which utilize those habitats.
4. Any 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 Unit(s) 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 Unit(s) 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.

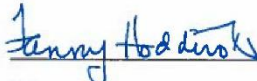
7. If at any time during the term of this Stewardship Agreement the Parties deem it necessary or desirable to make any alterations or additions to it, they may do so by means of a written amendment between them which shall be supplemental to and form part of this agreement.

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

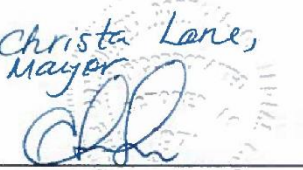




**THE HONOURABLE THE
MINISTER OF ENVIRONMENT
AND CONSERVATION**

THE SEAL OF the Town Council of the Town of Indian Bay hereunto affixed in the presence of:

Tammy Waterman,
Town Clerk/Manager


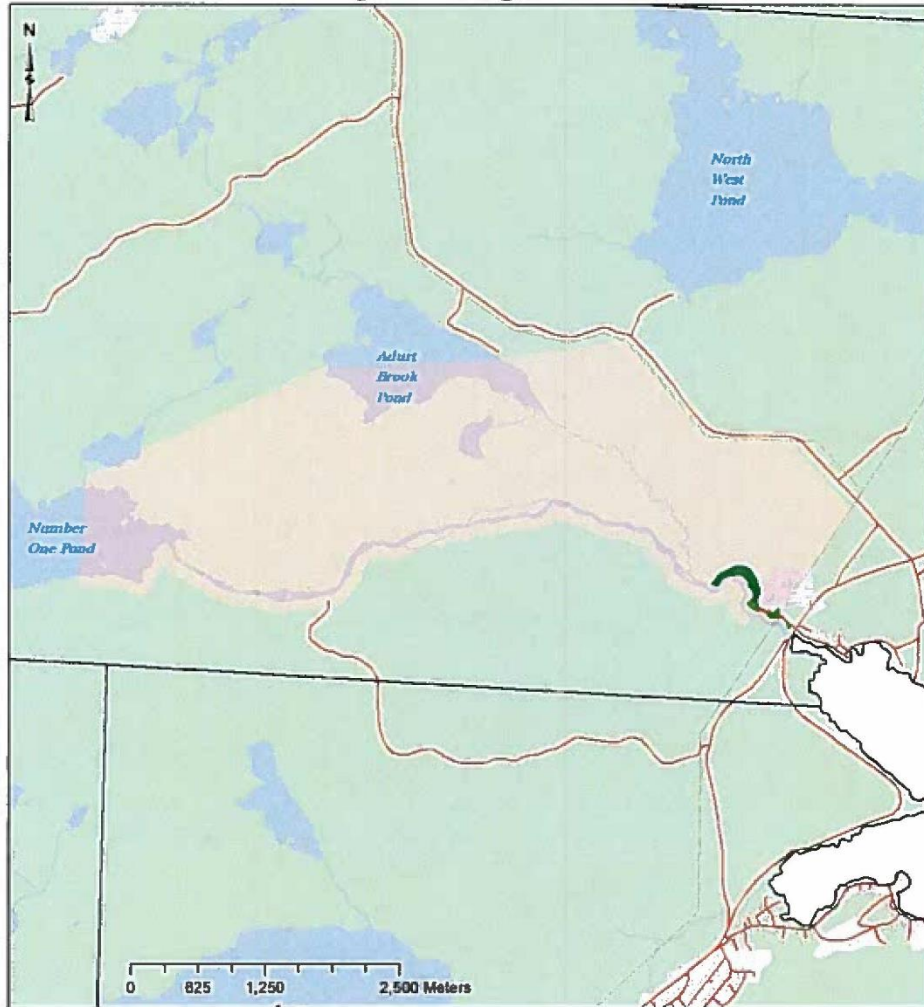
Witness


Christa Lane,
Mayor


**THE TOWN COUNCIL OF THE
TOWN OF INDIAN BAY**

SCHEDULE A

Indian Bay Management Unit



Legend

- | | |
|--------------------|-----------|
| Municipal Boundary | Water |
| Management Unit | Wooded |
| Park | Powerline |
| Park Expansion | Roads |
| Wetlands | Buildings |

Projection Information: NAD 83

February, 2016

Appendix 2: Conservation enforcement form

Complaint / information related to conservation, hunting, or wildlife enforcement issues

You can also report any issues online 24/7 by calling 1.877.820.0999 or at stoppoaching.ca

You can stay anonymous, whether it's by phone, online, or on this form

Please fill in as much of the following information as you can. Even partial info can be helpful

| | |
|---|--|
| Date When did it happen? Or is it an ongoing issue? | |
| Time Is there a specific time of day when it happens? | |
| Suspects Do you have an idea of who it might be? | |
| Location Where is it happening? Being as specific as possible will help | |
| Vehicles Description of vehicles (ATVs, cars, trucks, boats, etc.) being used and/or licence plates | |

Please fill in any other details you have regarding the complaint/information

Do you wish to remain anonymous (Circle one)

Yes No

If you choose to provide your name or number, you may be contacted for follow up. If you provide this info it will be kept confidential by enforcement, or you may remain completely anonymous by leaving both these spaces blank. Thank you – you've played an important role in protecting your natural resources.

**Name
(optional)**

**Phone
(optional)**

Appendix 3: Bird & Bat Houses

(from Ohio Division of Wildlife – Wildlife Diversity and Endangered Species Program – not all species listed below will be found in your area)

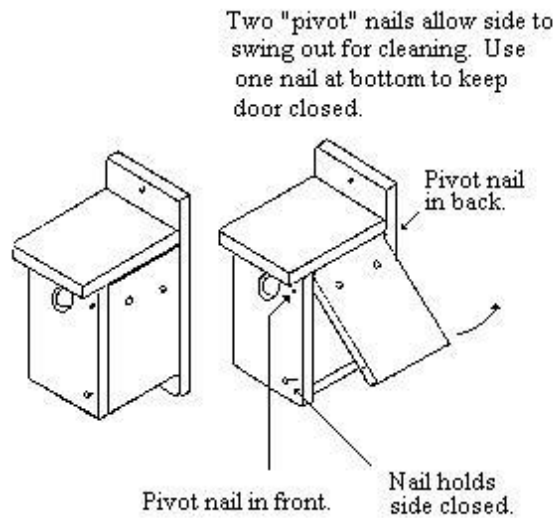
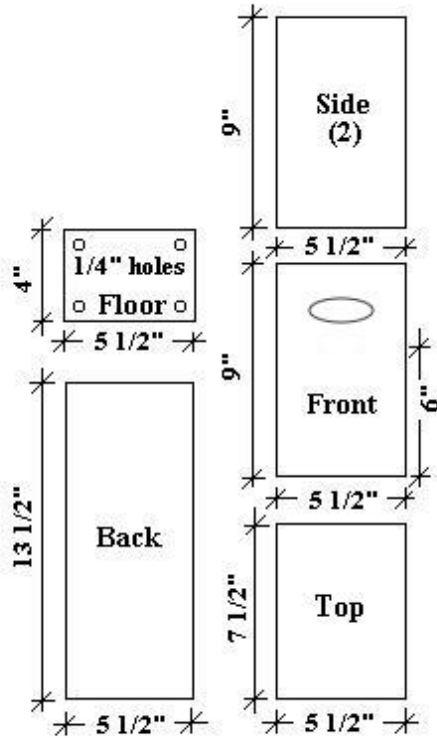
| Species | Specifications | | | | | |
|----------------------------|--------------------|-------------|------------------|-------------|-------------------|--|
| | Inches | | | | Feet Above Ground | Preferred Habitat |
| | Entrance | | Floor Dimensions | House Depth | | |
| | Diameter | Above Floor | | | | |
| 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.

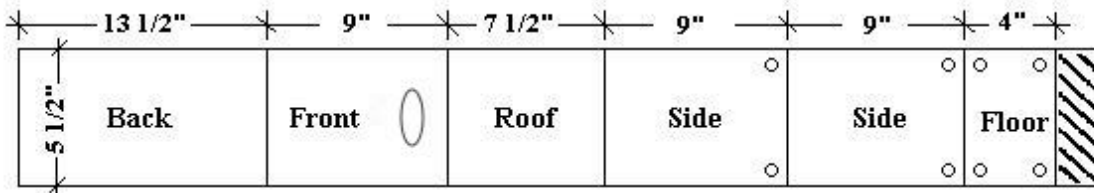
Removing unwanted species such as starlings and house sparrows will increase your chances for nesting success.

Tree Swallow Nest Box Plans

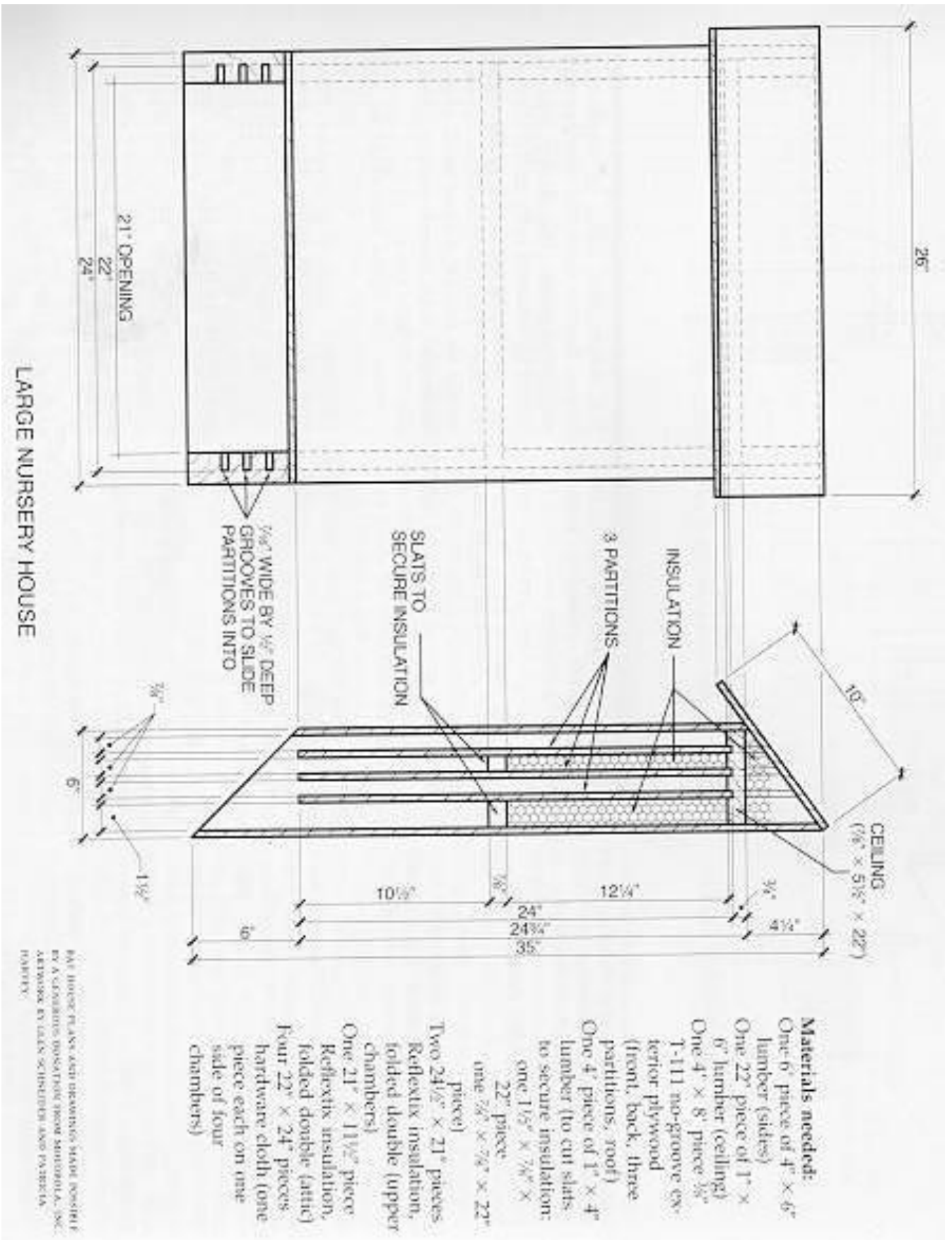
Entrance hole should be 1.5 inches high



Lumber: One 1" x 6" x 6'



Bat Roosting Boxes



Appendix 4: 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>Symphyotrichum 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 | <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 |

| | | | | |
|-------------------------------|----------------------------------|--------------------------------|--|--|
| goldenrod | | | | 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 conditions | Vegetation buffer; fence row; nectar source for pollinators; food source |
| Red-osier dogwood | <i>Cornus sericea</i> / | Coast to coast | Full sun to partial shade in moist to | Vegetation buffer; fence row; food, cover, and nesting sites for birds |

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|------------------------|----------------------------|--|---|---|
| | <i>Cornus stolonifera</i> | | wet soils; stream banks; lake shores; wetlands | 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 source 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 source 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 ("juniper" in NL) | <i>Larix laricina</i> | YT, NWT, ON, QC, NB, NS, PEI, NL | Alongside stream banks and lake shores; wet sites alongside wetlands | Vegetation buffer; food and cover for shoreline birds and mammals |
| Trembling | <i>Populus</i> | MB, ON, QC, NB, | Full sun to partial | Erosion control; vegetation buffer; |

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|--------------|------------------------------|--|---|---|
| aspen | <i>tremuloides</i> | NS, PEI, NL | shade; wide range of shoreline soils | 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 |

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|---------------------------------|--|-------------------------------------|---|---|
| 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 |

