NATIONAL CONSERVATION PLAN

Estuary Islands National Wildlife Area Management Plan

PROPOSED

Government of Canada Gouvernement du Canada

Canada

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About Environment Canada's Protected Areas and Management Plans

What are Environment Canada Protected Areas?

Environment Canada establishes marine and terrestrial National Wildlife Areas for the purposes of conservation, research and interpretation. National Wildlife Areas are established to protect migratory birds, species at risk, and other wildlife and their habitats. National Wildlife Areas are established under the authority of the *Canada Wildlife Act* and are, first and foremost, places for wildlife. Migratory Bird Sanctuaries are established under the authority of the *Migratory Birds Convention Act, 1994* and provide a refuge for migratory birds in marine and terrestrial environments.

What is the Size of the Environment Canada Protected Areas Network?

The current Protected Areas Network consists of 54 National Wildlife Areas and 92 Migratory Bird Sanctuaries comprising more than 12 million hectares across Canada.

What is a Management Plan?

A management plan provides the framework in which management decisions are made. It is intended to be used by Environment Canada staff to guide decision making, notably with respect to permitting. Management is undertaken in order to maintain the ecological integrity of the protected area and to maintain the attributes for which the protected area was established. Environment Canada prepares a management plan for each protected area in consultation with First Nations and other stakeholders.

A management plan specifies activities that are allowed and identifies other activities that may be undertaken under the authority of a permit. It may also describe the necessary improvements needed in the habitat, and specify where and when these improvements should be made. A management plan identifies Aboriginal rights and allowable practices specified under land claims agreements. Further, measures carried out for the conservation of wildlife must not be inconsistent with any law respecting wildlife in the province in which the protected area is situated.

What is Protected Area Management?

Management includes monitoring wildlife, maintaining and improving wildlife habitat, periodic inspections, enforcement of regulations, as well as the maintenance of facilities and infrastructure.

Research is also an important activity in protected areas; hence, Environment Canada staff carries out or coordinates research in some sites.

The Series

All of the National Wildlife Areas are to have a management plan. All of these management plans will be initially reviewed five years after the approval of the first plan, and every ten years thereafter.

To Learn More

To learn more about Environment Canada's protected areas, please visit our website at www.ec.gc.ca/ap-pa or contact the Canadian Wildlife Service.

Estuary Islands National Wildlife Area

Estuary Islands National Wildlife Area (NWA) is made up of approximately a dozen islands or portions of islands. It encompasses a total area of 404 hectares and extends over 120 kilometres in the St. Lawrence Lower and Upper Estuaries between Kamouraska and Rimouski (Le Bic). This wildlife area was created in 1986 by Environment Canada's Canadian Wildlife Service with the purpose of protecting important nesting sites for migratory birds, notably colonial seabirds, and particularly the Common Eider.

These rocky islands are surrounded by brackish or salt water and bordered by wide, muddy or rocky intertidal flats with communities of mixed algae. The islands themselves are covered in Balsam Fir-White Birch stands as well as White Spruce and herbaceous vegetation.

This protected area is home to approximately one hundred species of birds, a large proportion of which are nesters. Furthermore, five of these islands have been designated Important Bird Areas (IBA). The NWA accommodates large colonies of seabirds such as the Common Eider, the NWA’s most abundant bird, as well as the Razorbill, Black Guillemot, Black-legged Kittiwake, Double-crested Cormorant, Great Black-backed Gull and Herring Gull. Approximately 10 000 pairs of Common Eiders nest in the NWA; this accounts for just over half of this species' nesting pairs in the St. Lawrence Estuary. The Île Bicquette colony alone numbers more than 8 000 pairs, making it one of the largest colonies of Common Eiders in North America. Waterfowl species other than the Common Eider are infrequent during the nesting season, but thousands of Brants, Snow Geese, American Black Ducks, Scoters and Goldeneyes, as well as numerous shorebirds use these islands, along with the intertidal flats and adjacent waters during migration. Three species at risk frequent the NWA and its surroundings: the Peregrine Falcon, Red Knot and Barrow’s Goldeneye. The NWA is also home to about a dozen species of terrestrial mammals, the most common of which are the Red Fox, Snowshoe Hare and Muskrat. Moreover, the Grey Seal and the Harbour Seal use the shores of certain islands as haul-out sites.

Estuary Islands NWA is exposed to a range of threats and presents a number of management challenges, particularly wildlife diseases, habitat degradation, the impact of predators, the impact of human activities, invasive plant species, accidental spills, fragmentation, and facilities, infrastructure, and lands maintenance as well as gaps in scientific knowledge.

Owing to the fragility of the lands and of the wildlife species that inhabit it, public access to the NWA is prohibited, except on Le Pot du Phare island. Access to this island is allowed for public education purposes, but only after the seabird nesting season, from mid-July to mid-October, and is conditional on using the transportation service provided by the agency authorized by Environment Canada.

The goals for this management plan are: 1) to protect and improve habitats that are important for species at risk, priority bird species and other wildlife; 2) to reduce the impact of human activities on the NWA; 3) to consolidate the NWA's land holdings and promote the conservation of natural habitats on adjacent islands; 4) to ensure ecological monitoring of the NWA and improve knowledge about its wildlife and their habitats.

This document is the first approved management plan for Estuary Islands NWA. It will be implemented over 10 years based on priorities and available resources.

For greater certainty, nothing in this management plan shall be construed so as to abrogate or derogate from the protection provided for existing Aboriginal or treaty rights of the Aboriginal peoples of Canada by the recognition and affirmation of those rights in section 35 of the *Constitution Act, 1982*.

Table of Contents

1 DESCRIPTION OF THE PROTECTED AREA

Estuary Islands NWA was created in 1986 by Environment Canada's Canadian Wildlife Service to protect important nesting sites for migratory birds, especially colonial seabirds and particularly the Common Eider (*Somateria mollissima*). It is home to this species' largest colony in North America. Table 1 summarizes general information about this NWA.

This protected area of 404 hectares is located in the brackish and salt waters of the St. Lawrence River Lower and Upper estuaries. It is made up of approximately a dozen islands or portions of islands, which are spread out over 120 kilometres between Kamouraska and Rimouski (Le Bic) (Figures 1 and 2 and Table 2) and are at a maximum elevation of approximately 30 metres. The distance separating the islands from the south shore varies between two and ten kilometres. The larger islands are mostly colonized by Balsam Fir-White Birch stands and White Spruce stands; while the smaller islands are generally covered in wet meadows composed of herbaceous vegetation.

Table 1: Information on Estuary Islands National Wildlife Area

Protected Area Designation	National Wildlife Area
Province or Territory	Québec – Municipalities of Kamouraska, Saint André and Rimouski (Le Bic); Regional County Municipality (RCM) of Kamouraska and RCM of Rimouski-Neigette
Latitude and Longitude	48°04'N and 69°29'W
Size	404 ha: 83.5 ha of lands and 320 ha of intertidal flats
Protected Area Selection Criteria (Protected Areas Manual[1])	Criteria 1a – The area's islands play a vital role in seabird nesting in the St. Lawrence Estuary, especially for the Common Eider, and they are an important resting and feeding place for waterfowl and shorebirds. Criteria 3a – The area provides colonial birds of the St. Lawrence Estuary with an island habitat that is relatively protected from the threats of predators and human disturbances.
Protected Area Classification System (Protected Areas Manual[1])	Category A – Conservation of species or critical habitat
International Union for Conservation of Nature (IUCN[2]) Classification	Category Ia – Strict nature reserve
Order-in-Council Number	SOR/DORS/2000-123
Directory of Federal Real Property (DFRP) Number	27013 (Île Bicquette only)
Gazetted	1986
Additional Designations	The following islands in the NWA are internationally designated as Important Bird Areas (IBA): Le Long Pèlerin (Les Pèlerins), Île aux Fraises, Le Pot du Phare (Brandypot Islands), Île Blanche and Île Bicquette.

Table 1: Information on Estuary Islands National Wildlife Area (continued)

Faunistic and Floristic Importance	More than half of the estuary's Common Eider pairs, approximately 10 000 couples, nest in the NWA. The NWA also supports large colonies of Razorbill and Black Guillemots. La Grande Île is home to Quebec's westernmost colony of Black-legged Kittiwakes.
Invasive Species	On certain islands, exotic (or introduced) plant species make up 25 to 35% of all plant species in open areas. Some of them are considered invasive, including the Reed Canary Grass, the Wild Radish and the Smooth Bedstraw. Some animal species such as the Double-crested Cormorant can cause damage to habitat should they become abundant.
Species at Risk	The area is home to a species that is at risk under Canada's *Species at Risk Act* (SARA) and under Quebec's *Act respecting threatened or vulnerable species* (ARTVS), namely the Peregrine Falcon, which nests in the NWA. The Red Knot probably uses the NWA's intertidal flats and the Barrow's Goldeneye uses the adjacent waters.
Management Agency	Environment Canada – Canadian Wildlife Service
Public Access and Use	Restricted public access only on Le Pot du Phare, one of the Brandypot Islands (Îles du Pot à l'Eau-de-Vie). Hiking, wildlife observation and photography are authorized only in designated areas (trails, lookouts) and at certain times of the year.

[1] Environment Canada, 2005

[2] IUCN, 2008

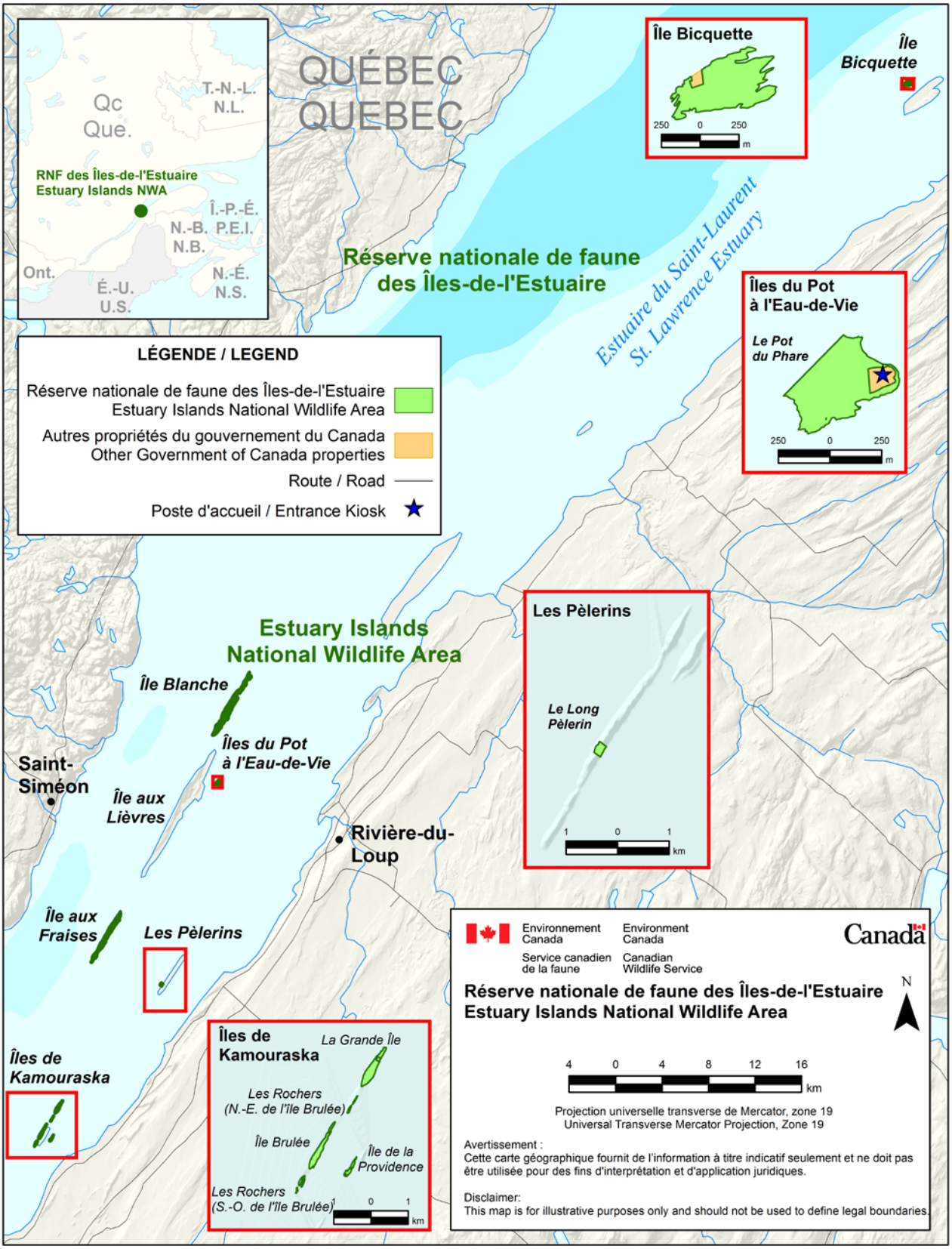

Figure 1: Estuary Islands National Wildlife Area

Table 2: Islands, parts of islands and intertidal flats in Estuary Islands National Wildlife Area [1]

Island or part of island	Estimated area (ha) [2]	
	NWA	Island (total area)
Îles de Kamouraska		
Île Brûlée	14.74	14.74
Les Rochers (southwest of Île Brûlée) [3]	2.48	2.48
Les Rochers (northeast of Île Brûlée) [4]	1.43	1.43
Île de la Providence	3.72	3.72
La Grande Île (part)	18.38	19.33
Les Pèlerins		
Le Long Pèlerin (part)	3.80	71.04
Brandypot Islands (Îles du Pot à l'Eau-de-Vie)		
Le Pot du Phare (part)	7.76	9.33
Le Pot du Phare intertidal flats	4.68	–
Others		
Île Blanche and reefs	5.95	5.95
Île Blanche intertidal flats	202.73	–
Île aux Fraises and reefs	8.50	8.50
Île aux Fraises intertidal flats	113.17	–
Île Bicquette (part)	16.73	17.38
TOTAL (terrestrial)	**83.50**	
TOTAL (flats)	**320.58**	
GRAND TOTAL	**404.08**	

[1] The NWA's islands, parts of islands and flats are the property of Environment Canada and are managed by the Department.

[2] Source: Environment Canada, 2013a

[3] Sometimes called the western reefs.

[4] Sometimes called the eastern reefs.

Figure 2: La Grande Île in Estuary Islands National Wildlife Area
Photo: Chantal Lepire © Environment Canada, Canadian Wildlife Service

1.1 REGIONAL CONTEXT

Estuary Islands NWA extends over 120 kilometres between Kamouraska and Rimouski (Le Bic). As a result of its geographic spread, it straddles several administrative entities. It is part of the municipalities of Kamouraska, Saint-André and Rimouski, and the regional county municipalities (RCM) of Kamouraska and Rimouski-Neigette, located in the Bas-Saint-Laurent administrative region. The territory of the RCM of Kamouraska, which is home to 22 000 people, is involved in agriculture, forestry, energy, and tourism, among others. The manufacturing sector plays an important role and benefits from the presence of major employers. The RCM of Rimouski-Neigette is home to more than 54 000 people, 85% of whom live in Rimouski. This city, which is an important regional economic driver, supports a commercial seaport, a high concentration of businesses, services, educational and health institutions, numerous corporate headquarters and major administrative centres. The RCM also includes a large area dedicated to agriculture, forestry and tourism. The Bas-Saint-Laurent region has various tourist attractions including parks, gardens, bike paths, hiking trails, museums, and historical sites. Further, discovery activities on the St. Lawrence, such as kayak excursions and whale watching cruises, are offered at locations such as Saint-André, Rivière-du-Loup, Trois-Pistoles, and Le Bic (Rimouski).

None of the islands in the NWA are inhabited or open to the public, with the exception of Le Pot du Phare, in the Brandypot archipelago, where nature observation, interpretation activities, hiking and lodging services are permitted during the summer and where close to 1 000 tourists go annually. Seasonal access to the island is allowed under an agreement between Environment Canada and Société Duvetnor Ltée, which owns the other islands in the archipelago (Le Gros Pot and Le Petit Pot). This organization is also a tenant of the lighthouse that is located on the north-eastern tip of Le Pot du Phare (on lands owned by Fisheries and Oceans Canada) and is used for lodging. The collection of eiderdown, which does not threaten the species in any way, is carried out in some of the NWA's islands by Société Duvetnor Ltée and the Société protectrice des eiders de l'estuaire (SPEE), two non-profit organizations. Interpretive activities and down collection are authorized by Environment Canada under commercial permits. These two organizations have been active in the preservation and development of the area for several years through service delivery contracts awarded by Environment Canada. In addition to the recreation and tourism activities it manages at Le Pot du Phare, Société Duvetnor monitors and protects the NWA's main islands. This organization has significantly contributed to the knowledge and protection of resources for more than 30 years. The SPEE has monitored and protected Île Bicquette for close to 25 years.

The NWA is part of a network of sites dedicated to preserving the natural heritage of the St. Lawrence Estuary and its coastline, including Parc national du Bic, a terrestrial provincial park located west of Rimouski, and Saguenay-St. Lawrence Marine Park. The latter encompasses a large portion of the St. Lawrence Estuary and almost all of the Saguenay River Fjord, and is jointly managed by Parks Canada and Parcs Québec. Several of the estuary's islands are protected by non-profit organizations, including the Société Duvetnor (which owns the Les Pèlerins archipelago, with the exception of Le Long Pèlerin island, and Le Gros Pot and Le Petit Pot islands in the Brandypot archipelago), the Nature Conservancy of Canada (which owns a portion of Le Long Pèlerin) and the Société Provencher (which owns the Razades islands and Île aux Basques). In addition, a large portion of Île aux Lièvres, formerly owned by Duvetnor, was recently acquired by Québec's Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs (MDDEFP). Duvetnor still owns a small portion of the island (59 ha).

1.2 HISTORICAL BACKGROUND

1.2.1 Prehistory

Approximately 10 000 years ago, the Bas-Saint-Laurent region lay under a post-glacial sea (Dionne, 1977). As the waters receded, the area became habitable. Archeological sites discovered in Rimouski, notably in Le Bic, that date back to the oldest prehistoric period in north-eastern America, the Paleo-Indian (11 000 to 7 000 before present), suggest the existence of human settlement in the Bas-Saint-Laurent prior to 8 000 before present. There is little evidence left of these Paleo-Indian's

way of life, but it appears that they lived off hunting, fishing and gathering (Fortin et al., 1993). Several sites from subsequent periods (Archaic and Woodland, 7 000 to 500 before present) were discovered in the Bas-Saint-Laurent. They indicate that for several centuries Aboriginals frequented the shores of the post-glacial sea and, later, of the estuary as well as inland areas, searching for land and water game (Fortin et al., 1993).

1.2.2 History

European contact

When contact with Europeans occurred (historical period, around the 1500s), the Aboriginals living in the region that is now southern Quebec divided into two major groups or linguistic families: the Algonquians (e.g., the Montagnais or Innus and the Maliseets) and the Iroquoians (first the St. Lawrence Iroquoians, who disappeared from the St. Lawrence Valley after the passage of Jacques Cartier, and later the Mohawks and Hurons). Although the Iroquoians frequented the Bas-Saint-Laurent during long journeys from their wintering areas located further upstream, the region was mainly frequented or inhabited by Algonquians, including Innus, Mi'kmaq, Maliseets and possibly the Abenakis of the East (Fortin et al., 1993).

Between 1550 and 1652, the Innu hunting grounds covered the entire Bas-Saint-Laurent (between Rivière du Loup and Rivière Matane) and a large portion of the north shore (between La Malbaie, Sept-Îles and Lake Mistassini) (Fortin et al., 1993). They also occupied the islands next to the south shore (F. Parcoret, pers. comm., 2013). Around the same time, the Mi'kmaq traditional territory extended between Prince Edward Island and Gaspé. Therefore, present-day Bas-Saint-Laurent was located on the northwestern edge of their territory. The Maliseets inhabited a vast territory that included a large part of present-day Bas-Saint-Laurent, New Brunswick and Maine, the heart of which was the Saint John River valley (N.B.). These people's way of life was disrupted to a large extent by the arrival of the Europeans. The Innu population declined in the middle of the 17th century (starting in 1652). The Mi'kmaq and Maliseets were still very present in the Bas-Saint-Laurent area during the 17th and 18th centuries, but they subsequently experienced periods of crisis and decline (Fortin et al., 1993). Today, the Bas-Saint-Laurent's only aboriginal community is the Maliseets of Viger First Nation. It owns an area in the Township of Whitworth, near Rivière-du-Loup, and a small plot of land in Cacouna, which is the smallest aboriginal reserve in Canada (Maliseets of Viger First Nation, 2014).

Colonization and seigneurial system

The earliest settlements of a sedentary population in the Bas-Saint-Laurent were created under the French seigneurial system (1653-1854). This system involved granting a portion of land to entrepreneurs (the "seigneurs"), where they would establish inhabitants ("censitaires" or settlers). Between 1653 and 1751, 19 seigneuries were granted in the Bas-Saint-Laurent (Fortin, 2003; Fortin et

al., 1993). The area's islands were allocated at that time, and were the subject of countless transactions, gifts, legacies and sales over the next three centuries. Bédard (2010) describes some of these transactions:

- Île aux Fraises, Île Blanche and Le Pot du Phare [as well as Île aux Lièvres] were granted to the Sieur de Saint-Lusson on November 7, 1672.
- The Îles de Kamouraska were granted to the Sieur de La Durantaye in 1674. They are all quite close to the St. Lawrence's south shore and several of them are accessible by foot at low tide. This proximity explains their marked human use and the existence of residual fishing rights. Several weir sites were set up on the shores of the archipelago's islands under rights often vested by deeds.
- Île Bicquette was granted to Monsieur de Vitré on May 6, 1675 (along with the Île du Bic).
- The Les Pèlerins archipelago was granted to François Jean Baptiste Deschamps, Sieur de la Bouteillerie, and to Étienne Landron and Louis de Niort on May 11, 1697, as a fiefdom and a seigneurie. The archipelago was used mostly as a commercial fishing station.

During the first half of the 18th century, the settlement of the Bas-Saint-Laurent progressed very slowly. During that time, the population was concentrated in four seigneuries: Rivière-du-Loup, L'Isle-Verte, Trois-Pistoles and Rimouski. Even after the British Conquest (1759), the Bas-Saint-Laurent was too far from the centre of the colony and had little appeal for young families who preferred the good farming lands of the Côte-du-Sud (south shore of the river between Beaumont and Kamouraska). The overpopulation of the Côte-du-Sud seigneuries eventually led to increased settlement in the Bas-Saint-Laurent region in the early 1800s (Fortin, 2003).

National Wildlife Area

Environment Canada acquired the NWA's islands and portions of islands from private owners (by mutual agreement) and through interdepartmental transfers. On June 19, 1986, Environment Canada created Estuary Islands National Wildlife Area to protect colonial seabirds that nest in the estuary and their habitats, specifically a significant portion of the Common Eider population. When the NWA was created, the Îles de Kamouraska, Les Pèlerins, Le Pot du Phare, Île aux Fraises and Île Blanche had Migratory Bird Sanctuary status. Since this status was no longer necessary given the area's new status as an NWA, these five sanctuaries were abolished in 1996 by an Order in Council.

This document is the first approved management plan for Estuary Islands NWA. A conservation plan of this protected area was published in 2003 (Canadian Wildlife Service, 2003).

1.3 LAND OWNERSHIP

The islands, portions of islands and intertidal flats (or foreshores) that make up the NWA are owned and managed by Environment Canada. The total area of the islands and portions of islands is 83.5 hectares and the total area of the intertidal flats is 320.58 hectares. Only the intertidal flats surrounding Île Blanche, Île aux Fraises and Le Pot du Phare are part of the NWA.

Some of the islands and portions of islands adjacent to the NWA remain private property, while several belong to organizations dedicated to preserving and enhancing the environment. In addition, Fisheries and Oceans Canada owns parcels of land adjacent to the NWA on Île Bicquette, Le Pot du Phare and La Grande Île.

1.4 FACILITIES AND INFRASTRUCTURE

The NWA's facilities and infrastructure are described below and in Table 3. The portion of Île Bicquette that is in the NWA (Figure 3) includes some infrastructure, i.e. the former lighthouse keeper's house, a foghorn building, a pump building, a boathouse and a cross (Figure 5). There is a shed on the boundary between the NWA and a parcel of land that belongs to Fisheries and Oceans Canada (its exact location remains to be confirmed).

Le Pot du Phare (Figure 4), in the Brandypot Islands, includes a trail that measures approximately one kilometre, short boardwalks, wooden observation platforms and stairs (Figure 6) located inside the NWA, the ownership of which remains to be confirmed. On Le Long Pèlerin, a skeleton tower (automated light) and a brick tower (lighthouse ruins) located in the NWA belong to Fisheries and Oceans Canada (Figure 7). On Île de la Providence, in the Îles de Kamouraska, a cottage located in the NWA and belonging to Environment Canada is in an advanced state of deterioration.

Fisheries and Oceans Canada owns some land adjacent to the NWA as well as navigational aids and other infrastructure located within. This includes three automated lights installed on skeleton towers and located on La Grande Île, Le Pot du Phare and Île Bicquette. The lighthouses on Île Bicquette and Le Pot du Phare are still present, but are no longer in operation. The lighthouse on Le Pot du Phare (Figure 8) is a classified federal heritage building that is employed by Société Duvetnor as its operations centre (in addition to other infrastructure on site, including a dock, the lighthouse keeper's house, a kitchen and an information pavilion). The land owned by Fisheries and Oceans Canada also includes two heliports, one on Île Bicquette and the other on Le Pot du Phare. The foghorn building on Île Bicquette is recognized as a federal heritage building by the Federal Heritage Building Review Office (FHBRO) owing to its historic and architectural significance and the special place it holds in its environment.

Table 3: Facilities and infrastructure in the Estuary Islands NWA

Island	Type of facility or infrastructure	Approximate area or length	Owner
Île de la Providence	Disused cottage	100 m^2	Environment Canada
Le Long Pèlerin	Brick tower (lighthouse ruins) Skeleton tower (automated light)	10 m 13.9 m	Fisheries and Oceans Canada
Le Pot du Phare	Sentier La Chaloupe (trail) Wooden stairs, observation platforms, small bridges and walkways (boardwalks)	1 km	Environment Canada (the ownership of these structures remains to be confirmed)
Île Bicquette	Old lighthouse keeper's house Foghorn building Pump building Boathouse Cross Shed	160 m^2 145 m^2 9 m^2 80 m^2 — 9m^2	Environment Canada (the exact location and ownership of the shed remains to be determined)

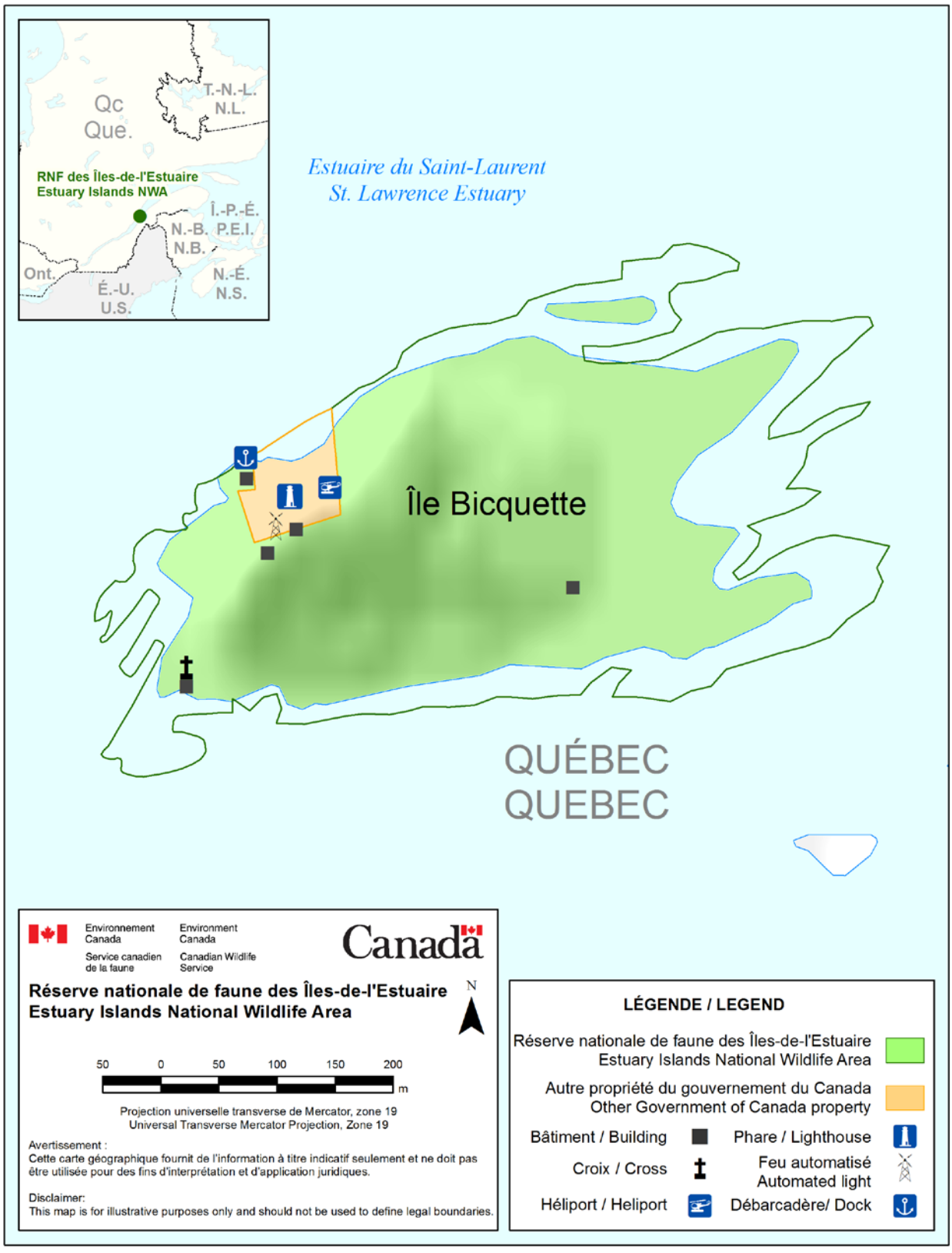

Figure 3: Facilities and infrastructure on Île Bicquette

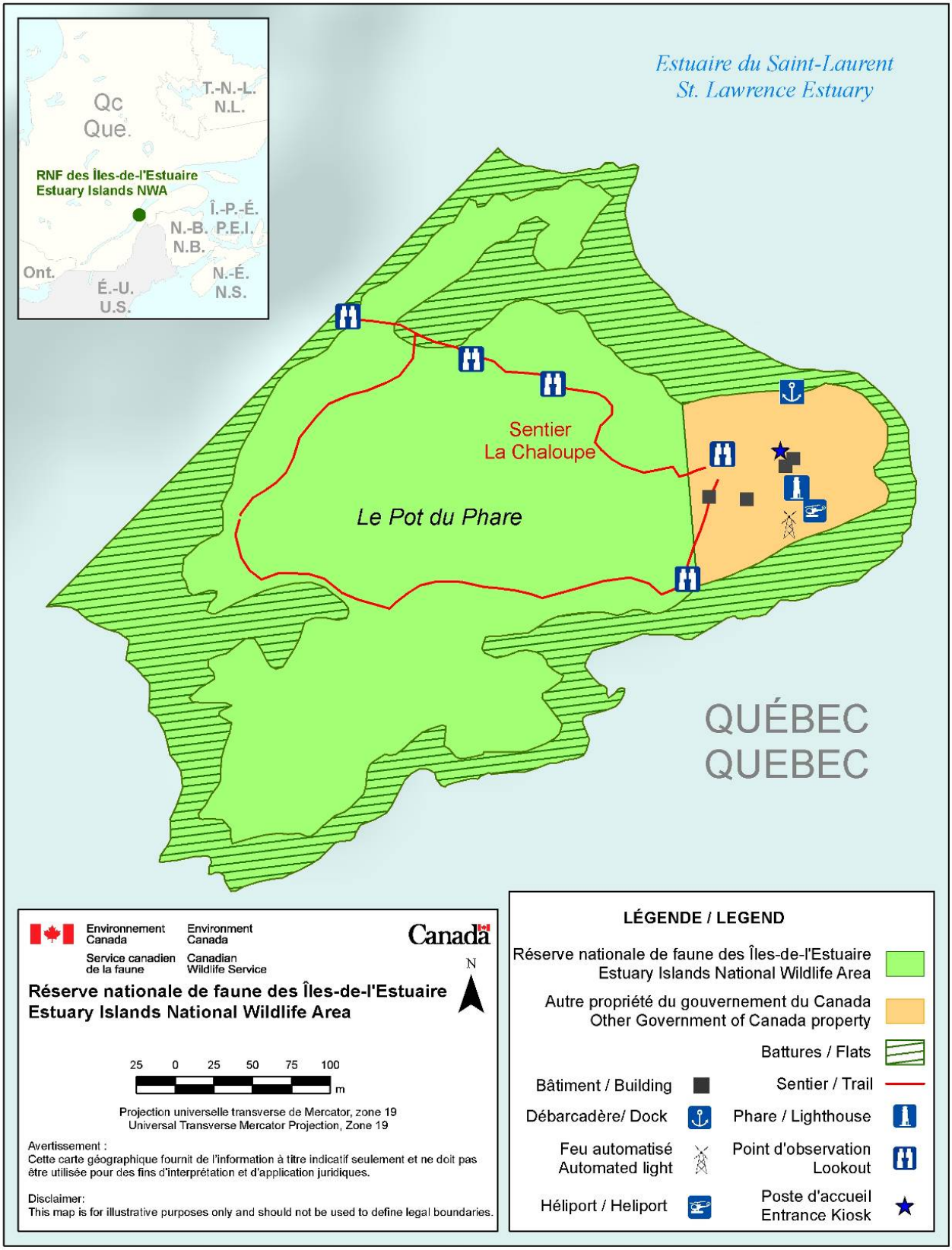

Figure 4: Facilities and infrastructure on Le Pot du Phare

Figure 5: Cross, automated light, former lighthouse and foghorn building on Île Bicquette

Photo: Patrick Labonté © Environment Canada, Canadian Wildlife Service

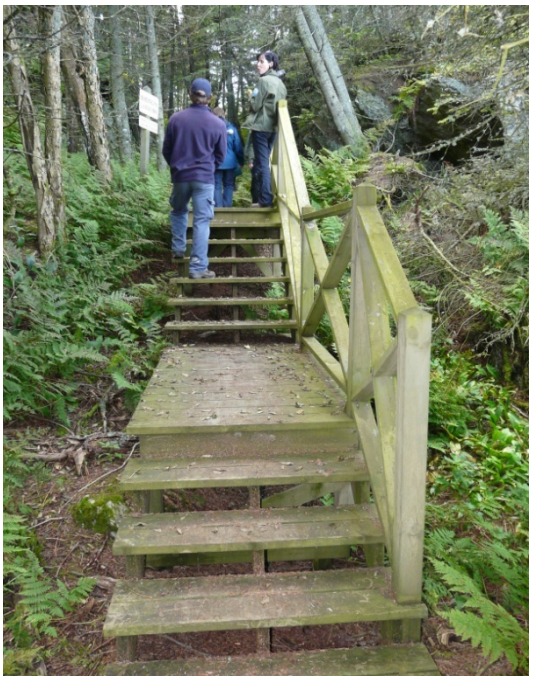

Figure 6: Stairs on La Chaloupe trail located on Le Pot du Phare

Photo: Stéphane Turgeon © Environment Canada, Canadian Wildlife Service

Figure 7: Automated light and old lighthouse on Le Long Pèlerin

Photo: Sylvain Giguère © Environment Canada, Canadian Wildlife Service

Figure 8: Lighthouse and buildings on Le Pot du Phare (outside the NWA), Société Duvetnor's operations centre

Photo: Benoît Roberge © Environment Canada, Candian Wildlife Service

2 ECOLOGICAL RESOURCES

2.1 TERRESTRIAL AND AQUATIC HABITATS

The Estuary Islands NWA's underlying bedrock is made up of alternating layers of shale, sandstone blocks and conglomerates formed between the beginning of the Cambrian and the Ordovician, 570 to 440 million years ago.

This protected area is subject to daily semi-diurnal tides (two high tides and two low tides per lunar day). The majority of the NWA's islands are located in the St. Lawrence's Upper Estuary, which is characterized by brackish, turbid waters of low productivity. Île Bicquette, located in the Lower Estuary, is surrounded by rich, more productive salt water. The NWA's islands do not have any freshwater river systems.

The NWA is part of the Atlantic Maritime Ecoregion. It has a continental subpolar, subhumid climate. While most of the NWA's islands are located in the Sugar Maple – Yellow Birch bioclimatic zone, marine and weather conditions primarily support a Balsam Fir – White Birch vegetation type. Within the NWA, variation can be seen in the plant composition of terrestrial habitats from west to east. This variation depends on several factors, including substrate, type of soil, area and drainage. In general, the terrestrial portions of the NWA's islands are covered with Balsam Fir – White Birch stands and White Spruce stands (CWS, 2003) (Figure 9). Other common tree species include the American Mountain-Ash (*Sorbus americana*), the Pin Cherry (*Prunus pensylvanica*), the Trembling Aspen (*Populus tremuloides*) and the Balsam Poplar (*Populus balsamifera*).

The herbaceous vegetation that characterizes some of the non-forested islands and parts of islands was described by Reed (1975 in CWS, 2003) as being dominated by reedgrass (*Calamagrostis*) and a mixture of annual plants. Muskrats (*Ondatra zibethicus*) may be abundant in these herbaceous areas, and their digging can contribute to the presence of plants typical of disturbed environments such as the Great Burdock (*Arctium lappa*) (Bédard and Guérin, 1991 in CWS, 2003).

More recently, plant surveys were carried out on three of the NWA's islands by Morisset (2010a, b and c in Bédard, 2010). Within the scope of the study 88 species of plants were identified on Île aux Fraises, 50 species on Île Blanche, and 151 species on Le Pot du Phare and the southern edge of Le Gros Pot, including several open country introduced species (Morisset, 2010a and b in Bédard, 2010). Morisset did not identify any rare plants on the three islands, but Asselin (1994 in Bédard, 2010) reports the presence of a very rare primrose, the Cowslip Primrose (*Primula veris*), on Le Gros Pot, located only a few dozen metres away from the NWA.

On all of the NWA's islands, the forest stands are highly disturbed as a result of multiple factors, such as intense grazing by the Snowshoe Hare (*Lepus americanus*), which has destroyed or severely reduced large numbers of forest perennials characteristic of similar stands on the mainland (Bédard et al., 1997 in Bédard, 2010). In addition, the Spruce Budworm (*Choristoneura fumiferana*)

caused major damage on all of the islands during the 1970s, particularly to the fir stands on Îles de Kamouraska and on Le Pot du Phare. However, this insect's impact was not as severe in the archipelago of Les Pèlerins, the forests of which are dominated by the Black Spruce (*Picea mariana*). It spared a portion of the Balsam Fir (*Abies balsamea*) forest on Île Bicquette, which is otherwise in decline for unknown reasons. This forest is unique because of its old age (up to 136 years old), the absence of regeneration, the extreme density of its trees and the absence of herbaceous and moss flora on the ground (Bélanger and Bédard, 1997 in Bédard, 2010). The Double-crested Cormorant (*Phalacrocorax auritus*) has also had a significant impact on the forest habitat. Its excrement (or guano) kills trees and has already destroyed forests on several occasions on certain islands, especially Île Blanche, Île Brûlée, La Grande Île and Le Pot du Phare (CWS, 2003). Spatio-temporal changes in the NWA's riparian and terrestrial vegetation, which have been observed since the 1970s, are well documented in the Labrecque and Jobin study (2012).

The succession, community composition and biomass of macrophyte algae in nearshore marine environments has been described in several parts of the estuary (Himmelman et al., 1983 and Bourget et al., 1994 in CWS, 2003), but never within the boundaries of the NWA or on equivalent coastal points (St. Lawrence Centre, 1996 in CWS, 2003). The macrophyte algae communities differ widely from one substrate to another. Very large beds of *Laminaria* can be found surrounding Île du Bic, between Île du Bic and Île Bicquette, and surrounding the Brandypot Islands. In addition, various sized beds of *Ascophyllum* and *Fucus* can be found in all of the islands' nearshore environments (Figure 10) and in the top portion of the sublittoral zone. These algal beds seem better developed and more widespread downstream than upstream (CWS, 2003).

Figure 9: Forest on La Grande Île
Photo: Benoît Roberge © Environment Canada, Canadian Wildlife Service

Figure 10: Île aux Fraises intertidal flats
Photo: Benoît Roberge © Environment Canada, Canadian Wildlife Service

2.2 WILDLIFE SPECIES

The NWA's wildlife is described in this section based on knowledge gathered over the past 30 years as a result of studies and surveys conducted by the Canadian Wildlife Service and various contributors such as Société Duvetnor. In addition, data on the organisms found in the waters adjacent to the NWA, including invertebrates, fish, and marine mammals, are presented as complementary information, given their ecological links with the NWA.

2.2.1 Invertebrates

Mollusks and Crustaceans

Several species of mollusks and crustaceans could be expected to be found in the sediments bordering the NWA. Softshell Clam (*Mya arenaria*) deposits are likely to be found in the Île Blanche and Île aux Fraises intertidal flats, while the Stimpson's Surfclam (*Mactromeris polynyma*) can be found around Île Bicquette and the Green Sea Urchin (*Strongylocentrotus droebachiensis*) is plentiful around Île Bicquette and Le Pot du Phare (DFO-SIGHAP, 2002 in CWS, 2003). Green Sea Urchins are fished in the spring (April and May) and the fall (from the end of October until ice formation begins) almost exclusively near Île Blanche and Île Bicquette. Some of the urchins are taken at the lower boundary of the intertidal flats (Bédard, 2010). Other species, such as the Atlantic Razor Clam (*Ensis directus*), Sea Cucumber (*Cucumaria frondosa*), Sand Shrimp (*Crangon septemspinosa*), Icelandic Scallop (*Chlamys islandic*), Rock Crab (*Cancer irroratus*) and Waved Whelk (*Buccinum undatum*) are found in the NWA (Brunel et al., 1998 in CWS, 2003). It appears that the American Lobster (*Homarus americanus*) and the Snow Crab (*Chionoecetes opilio*) also inhabit the waters surrounding Île Bicquette. It should be noted that these data (MPO-SIGHAP, 2002 in CWS, 2003) were extracted for a one-kilometre zone around the NWA.

Insects and spiders

In 1994 and 1995, sampling of insects and spiders was performed on approximately twenty islands in the estuary, including five islands that are part of the NWA (Nadeau et al., 2009). Insects from at least four orders (Coleoptera, Diptera, Hymenoptera and Orthoptera) and Arachnids (the class of animals that includes spiders) were identified in the area. In 1995, this sampling dealt more specifically with beetles from the Carabidae family. Forty species of insects in this family were identified. The most harvested species (47% of captured individuals) found on the greatest number of islands (17 out of 20 islands) was the *Pterostichus adstrictus* beetle (Nadeau et al., 2009).

Benthos

No studies have been carried out on benthic fauna in the NWA's mud and rock intertidal flats.

2.2.2 Fish

The NWA's islands are too small to have any permanent freshwater river system that would support a community of fish. However, the surrounding waters of the St. Lawrence Estuary support several species of marine fish, including forage species consumed by various aquatic birds that use the area. The main species found are the Atlantic Herring (*Clupea harengus*), which has two seasonal spawning cycles around the western islands (Les Pèlerins, Île aux Lièvres) and at least one spawning site around Île aux Lièvres (Munro et al., 1998 in CWS, 2003), as well as the American Sand Lance (*Ammodytes americanus*) and the Capelin (*Mallotus villosus*). The latter may spawn around the Îles de Kamouraska (DFO-SIGHAP, 2002 in CWS, 2003). The Atlantic Sturgeon (*Acipenser oxyrinchus*) has been subject to significant fishing, especially on the Saint-André bank (DFO-SIGHAP, 2002 and Caron, 2002 in CWS, 2003), between the archipelagos of Kamouraska and Les Pèlerins. The Atlantic Herring, Blackspotted Stickleback (*Gasterosteus wheatlandi*), Threespine Stickleback (*Gasterosteus aculeatus*) and Winter Flounder (*Pseudopleuronectes americanus*) inhabit the waters surrounding the NWA's islands. The Atlantic Halibut (*Hippoglossus hippoglossus*) was commercially fished near the Brandypot Islands (until approximately 1999) and near the Îles de Kamouraska. The American Shad (*Alosa sapidissima*) is also found in the Kamouraska and Les Pèlerins archipelagos. Finally, the American Eel (*Anguilla rostrata*) is found in the Îles de Kamouraska area in the fall, and the Atlantic Cod (*Gadus morhua*) is present off the coast of Île Bicquette (DFO-SIGHAP, 2002 in CWS, 2003).

2.2.3 Amphibians and reptiles

The NWA provides very little habitats suitable for amphibians and reptiles owing to the absence of freshwater. No surveys of herpetofauna have been carried out in the NWA. To date, only one species of amphibian has been identified on the islands of the upper estuary: the Blue-spotted Salamander (*Ambystoma laterale*), which was observed on Île aux Lièvres (Société Duvetnor, unpublished data in CWS, 2003). Only one species of reptile, the Common Garter Snake (*Thamnophis sirtalis*), is common and widely distributed across the island. It is possible that both of these species were introduced while transporting forage and agricultural equipment during agroforestry activities practised on Île aux Lièvres from 1920 to 1923 and from 1950 to 1953.

2.2.4 Birds

The islands in the estuary are essential for bird conservation because of their location in a significant migratory bird flyway and their role in bird reproduction and feeding. They are also critical in maintaining populations of several species of colonial birds (Chapdelaine and Rail, 2002). Five of the islands in Estuary Islands NWA (Bicquette, Blanche, Le Pot du Phare, aux Fraises and Le Long Pèlerin), as well as other surrounding islands, have been designated Important Bird Areas (IBA).

Colonial seabirds

Significant proportions of certain populations of colonial seabirds in Quebec reproduce in the NWA (Table 4). The numbers and distribution of the most common species on these islands – including the Common Eider, the Herring Gull (*Larus argentatus*), the Great Black-backed Gull (*Larus marinus*), the Great Blue Heron (*Ardea herodias*), the Black-crowned Night Heron (*Nycticorax nycticorax*), the Black-legged Kittiwake (*Rissa tridactyla*), the Common Murre (*Uria aalge*), the Black Guillemot (*Cepphus grylle*), and the Razorbill (*Alca torda*) – have experienced continual fluctuations (Bédard, 2010). Nonetheless, the main colonies have generally remained concentrated in the same areas.

Common Eider

The Common Eider population (*dresseri* subspecies) that nests in the estuary is thought to be one of the largest in North America. In 2009, it numbered 19 100 nesting pairs (Savard and Lepage, in prep.). Approximately 55% of these pairs nest in the NWA, mainly on Île Bicquette (16 214 individuals in 2012), Île Blanche (2 890 individuals in 2010) and Île aux Fraises (2 092 individuals in 2010) (Table 4). This bird is, therefore, the most abundant in the NWA despite significant fluctuations in its numbers owing to epidemics of avian cholera, hunting and juvenile mortality (Joint Working Group on the Management of the Common Eider, 2004). It appears, however, that the population in the estuary has decreased at a rate of approximately 2% per year over the last 25 years, which is worrisome (Bédard, 2010).

Impressive synchronous fluctuations in the Common Eider population in the estuary in recent decades suggest that common factors are at work on all islands, including the ones within the NWA (Giroux, 2008 in Bédard, 2010): three severe declines (1984 to 1985, 1992 to 1994, 2001 to 2002) coincided with three avian cholera outbreaks followed by a slow recovery. In 2002, approximately 10 000 birds (out of a total of close to 64 000) died from this bacterial disease (Giroux et al., 2002 in CWS, 2003). That year, the foci of mortality were more extensive than ever (Île Bicquette, Île Blanche, Île aux Pommes and Île aux Fraises), but the colonies on the north shore of the estuary were not affected (CWS, 2003).

Between 1985 and 1990, a joint effort by the Canadian Wildlife Service, Société Duvetnor and Ducks Unlimited Canada resulted in a major redevelopment of the Île Blanche habitat in order to eliminate the suspected cause of the infestation. These projects were followed by an intervention program on several islands in the estuary, which included planting shrubs and coniferous trees, controlled burning, and installing nest boxes for the Common Eider (Joint Working Group on the Management of the Common Eider, 2004). In addition, drainage swales were dug to prevent the formation of stagnant water ponds, which is conducive to the development of avian cholera (Jean-François Giroux, pers. comm., 2012). Epidemiological factors of this disease among the Common

Eider are still not well understood. There may be a carry-over effect (an epidemic at the end of the summer that could lead to another epidemic the following spring). The characteristics of the habitat appear to have fewer effects than what was believed in the 1980s (e.g. the Île Blanche redevelopment did not eliminate the problem even though it reduced the incidence and the scope) (Joint Working Group on the Management of the Common Eider, 2004).

Gulls and Black-legged Kittiwake

The Herring Gull is an important species in the NWA because of its abundance; however, its numbers have significantly declined over the years (Bédard, 1999 in CWS, 2003) for undetermined reasons (CWS, 2003). A significant decline has been observed for several decades: the number of pairs identified on Île aux Fraises went from 2200 in 1967 to only 67 in 1999; however, it was at 146 in 2001 (BIOMQ, 2012). Further, on other islands like Le Pot du Phare, the number of individuals in the species remained stable during the same period (Bédard, 1999 in CWS, 2003). The Herring Gull competes with a larger species in the same genus, the Great Black-backed Gull. These two species of gulls exert predation pressure on the majority of aquatic birds. Predation on juvenile Common Eiders by Great Black-backed Gulls is a real concern throughout the NWA, but especially on Île Blanche and Île Bicquette (Bédard, 2010). Ring-billed Gulls (*Larus delawarensis*) attempted to establish themselves on Île aux Fraises and Île Blanche at the end of the 1980s but failed to do so because of predation by the other two species of gulls.

The Black-legged Kittiwake nests on the Brandypot Islands and Les Pèlerins, but outside the NWA (CWS, 2003). Inside the NWA, this species nests on Île Bicquette where varying numbers of pairs were identified between 1986 and 2007, including 130 pairs in 1986, 693 pairs in 2001 and 350 pairs in 2007. It also uses La Grande Île, in the Îles de Kamouraska, where 18 pairs were observed in 2011 (BIOMQ, 2012). This is the westernmost colony of this species in Quebec.

Razorbill, Black Guillemot and Common Murre

Data collected between 1990 and 2001 indicate that there were only a few pairs of Razorbills in the NWA, on Le Long Pèlerin, Île Brûlée, La Grande Île, Le Pot du Phare (Bédard, 2002 in CWS, 2003) and Île Bicquette (SPEE, 1998). In 1999, the Razorbill colony in the archipelago of Les Pèlerins (the part outside the NWA) was the second largest in Canada with more than 1800 pairs identified (Bédard, 1999 and Chapdelaine et al., 2001 in CWS, 2003). Recent data show that it is still the main colony in this sector with approximately 331 pairs identified in 2011 (BIOMQ, 2012).

Some nesting pairs of Black Guillemots were observed on the Îles de Kamouraska (La Grande Île, Île Brûlée and Les Rochers), Le Long Pèlerin, Le Pot du Phare (63 pairs observed in 2011) and Île Bicquette (BIOMQ, 2012). The Common Murre can be found in small numbers among groups of Razorbills on Le Pot du Phare and Le Long Pèlerin, but there is now a large concentration of this

species on the other Brandypot islands (Le Petit Pot and Le Gros Pot), with more than 1000 individuals observed in each location in 2011 (BIOMQ, 2012).

Double-crested Cormorant

Occasional surveys of the Double-crested Cormorant show that several hundred pairs nest on the NWA's islands, mainly Île Bicquette, Île aux Fraises and La Grande Île (Table 4) (BIOMQ, 2012). Significant increases in numbers for this species were observed between 1978 and 1990 in the St. Lawrence. These were due in part to the decrease in human disturbance and persecution of the species as well as the abundance of food near the colonies (Chapdelaine and Bédard, 1995). The Double-crested Cormorant has an impact on the islands' forests, because its droppings can kill trees and alter the physical and chemical characteristics of the soil. As such, it devastated the NWA's forests in places where it had established colonies, including on Île Blanche between 1970 and 1985, Île Brûlée, La Grande Île, Le Pot du Phare and other islands located outside the NWA (CWS, 2003). In 1989, owing to the impact this species was having on the ecosystems, Quebec's Ministère du Loisir, de la Chasse et de la Pêche (MLCP) undertook a control program aimed at reducing its numbers on Île Brûlée, La Grande Île, Île aux Fraises, Île Blanche and the reefs of Île Bicquette. This program included culling adults and spraying eggs with oil (Bédard et al., 1995). Despite the effectiveness of this control, the Double-crested Cormorant's population remains present and continues to impact the environment.

Great Blue Heron and Black-crowned Night Heron

Aerial surveys conducted in 2001 identified 34 Great Blue Heron nests on Île Bicquette, 2 on Le Long Pèlerin, 31 on La Grande Île and 3 on Île Brûlée (Alain Desrosiers, pers. comm. in CWS, 2003). Le Gros Pot (outside the NWA, Brandypot Islands) has long supported a large colony of this species. Surveys carried out on this island identified three nests in 1977, 112 in 1992 and 24 in 2010, but no nests were seen in 2011 (BIOMQ, 2012).

The Black-crowned Night Heron's numbers have declined sharply on three of the NWA's islands, where the species had previously been abundant. On Le Pot du Phare, 443 nests were identified in 1991 and only 38 nests in 2002 (unpublished data, Duvetnor in CWS, 2003). On Île aux Fraises, close to 200 nests were observed in 1988, but the species was not seen there again. On Île Brûlée, the number of nests went from 537 in 1975 to only 6 in 1990 and the species was not seen there again (no nests between 2006 and 2008 and in 2011) (BIOMQ, 2012).

Waterfowl (other than the Common Eider)

Waterfowl species, other than the Common Eider, are uncommon in the NWA during nesting season, but significant numbers halt there during migration. Thousands of Brants (*Branta bernicla*) stage on Île Blanche during the spring, and hundreds of individuals were also observed on Île

Bicquette in spring 1998 (CWS, 2003). Several thousand Snow Geese (*Chen caerulescens*) stage near Île aux Fraises and Île Bicquette in the spring and close to the Îles de Kamouraska in the fall (Guy Verreault and Annie Bérubé, pers. comm., FAPAQ [Société de la faune et des parcs du Québec] de Rivière-du-Loup in CWS, 2003). The Black Scoter (*Melanitta americana*) and the Surf Scoter (*Melanitta perspicillata*) are also common in the islands' subtidal zone during migration. In addition, the Surf Scoter uses the Saint-André bank sector (between the Îles de Kamouraska and Les Pèlerins) during moulting (CWS, 2003). Thousands of American Black Ducks (*Anas rubripes*) use the intertidal flats surrounding Île Blanche, Île aux Fraises, Île aux Lièvres, the Brandypot Islands and the Îles de Kamouraska from mid-July to the beginning of November (approximately 5000 birds around these islands) (Bédard, Ouellet and Giroux, 1987 and Bédard, Ouellet, Giroux and Savard, 1988 in CWS, 2003), and small numbers winter in the sector (Gauthier, Choinière and Savard, 1992 in CWS, 2003).

In both spring and fall, tens of thousands of scoters, eiders and Long-tailed Ducks (*Clangula hyemalis*) gather in large numbers in the St. Lawrence Lower Estuary (Lepage and Savard, in prep.; Savard and Lepage, in prep.; Lepage and Cotter, in prep.). The estuary is also a major wintering site for several duck species, including the Long-tailed Duck (CWS, 2003), the Red-breasted Merganser (*Mergus serrator*) and the American Black Duck. The latter is particularly abundant between Tadoussac and Cap de Bon-Désir, and is especially common in the NWA's Île Bicquette sector (Robert et al., 2003). CWS surveys (Robert et al., 2003) showed that the St. Lawrence Estuary is also home to a large number of Common Goldeneyes (*Bucephala clangula*) and Barrow's Goldeneyes (*Bucephala islandica*, Eastern population) in winter and serves as the latter's main wintering ground (see 2.3 Species at Risk).

Shorebirds

Many species of shorebirds are common along the St. Lawrence during fall migration (Aubry and Cotter, 2007) and several of these species more than likely stopover in the NWA, especially the Red Knot (*Calidris canutus rufa*). No systematic survey of shorebirds has been carried out on the NWA's islands. However, one-time data collected by the CWS in fall 2008 (S. Giguère, pers. comm., 2012) helped to identify 11 species of shorebird on three of the NWA's islands or nearby (Île aux Fraises, Île Blanche, Île Bicquette), including the Semipalmated Plover (*Charadrius semipalmatus*), the Black-bellied Plover (*Pluvialis squatarola*), the Semipalmated Sandpiper (*Calidris pusilla*), the Dunlin (*Calidris alpina*), the Sanderling (*Calidris alba*), and the Least Sandpiper (*Calidris minutilla*). In addition, large numbers of Purple Sandpipers (*Calidris maritima*) are common on some of the NWA's islands (Île Blanche, Île aux Fraises, Île Bicquette) during the winter (Robert et al. 2003; Aubry and Cotter, 2007).

Table 4: Abundance[1] of colonial seabirds[2] in Estuary Islands NWA (Source: BIOMQ, 2012[3])

Location	Common Eider	Great Black-backed Gull	Herring Gull	Black-legged Kittiwake	Black Guillemot	Common Murre	Razorbill	Double-crested Cormorant
Îles de Kamouraska								
Île Brûlée	130 (2008)	14 (2011)	370 (2011)		20 (2011)		8 (2011)	2 (2011)
Les Rochers	70 (2011)	34 (2011)	732 (2011)		2 (2011)		78 (2011)	0 (2011)
La Grande Île	380 (1996)	12 (2011)	472 (2011)	36 (2011)	30 (2011)		152 (2011)	1 332 (2011)
Les Pèlerins								
Le Long Pèlerin	0 (2008)	14 (2011)	252 (2011)	0 (2011)	16 (2011)	2 (2011)	663 (2011)	
Brandypot Islands (Îles du Pot à l'Eau-de-Vie)								
Le Pot du Phare	620 (2010)	22 (2011)	1 126 (2011)		126 (2011)	1 (2011)	9 (2011)	0 (2011)
Other islands								
Île Blanche	2 890 (2010)	336 (2001)	292 (2001)					
Île aux Fraises	2 092 (2010)	394 (2001)	292 (2001)					64 (2010)
Île Bicquette	16 214 (2012)	518 (2007)	964 (2007)	700 (2007)	90 (2007)		120 (2007)	654 (2007)

[1] The figures shown indicate the number of nesting individuals and the year of the last data entry. For the Common Eider, Great Black-backed Gull, Herring Gull, Black-legged Kittiwake and Double-crested Cormorant, the number of individuals was obtained by multiplying the number of nests identified (therefore, the number of nesting pairs) by two. For the Black Guillemot, Common Murre and Razorbill, the number of individuals and not the number of nests was identified.

[2] The Great Blue Heron and the Black-crowned Night Heron, colonial waterbirds (not necessarily marine), do not appear in the table, but they are briefly described above.

[3] The *Banque informatisée des oiseaux marins du Québec* (BIOMQ, 2012; contact: Jean-François Rail, CWS) contains the survey results for 28 species of seabirds during reproduction in Quebec, mostly since 1976, but also data extracted from literature going back to 1833. These data mostly cover the Estuary and the Gulf of St. Lawrence. For the islands where only a portion is located in the NWA (e.g. Le Long Pèlerin), the survey data apply to the entire island.

Landbirds

In 2008, the CWS surveyed landbirds on the NWA's eight main islands (S. Giguère, pers. comm., 2012). The initial analysis indicates the presence of 40 species of landbirds, even though the data collected are preliminary and were collected in a single season. Since this survey was conducted in June, during the nesting season, the species identified possibly breed there. The data indicate that the large islands are home to a more diverse range of species than the smaller islands. La Grande Île (Îles de Kamouraska) is where the largest number of species (25) was identified, followed by (in descending order): Île Bicquette (19 species), Le Long Pèlerin (13 species), Île Brûlée (12 species), Le Pot du Phare (11 species), Île de la Providence (9 species) and, finally, Île aux Fraises (3 species) and Île Blanche (2 species). Only 8 of the 40 species identified were observed on four or more islands, with the most common being the American Crow (*Corvus brachyrhynchos*) (8 islands), the Song Sparrow (*Melospiza melodia*) (8 islands), the White-throated Sparrow (*Zonotrichia albicollis*) (6 islands), the Fox Sparrow (*Passerella iliaca*) (5 islands) and the Golden-crowned Kinglet (*Regulus satrapa*) (5 islands). Among birds of prey, only the Rough-legged Hawk (*Buteo lagopus*) was observed (on La Grande Île), but the only nesting bird of prey confirmed in the area is the Peregrine Falcon (*Falco peregrinus anatum/tundrius*) (see 2.3 Species at Risk).

2.2.5 Mammals

The quality of the NWA's islands as habitat for colonial seabirds is primarily determined by the relative lack of terrestrial predators. However, small numbers of such predators sometimes access the islands, where they have a considerable impact on the abundance of birds (Bédard, 2010). The Red Fox (*Vulpes vulpes*), the Long-tailed Weasel (*Mustela frenata*) and the American Black Bear (*Ursus americanus*) were all reported in various parts of the NWA, but the Red Fox in particular is responsible for the largest decline in nesting seabirds. It's population persists on Île du Bic and Île aux Lièvres (outside the NWA), where it feeds on a variety of prey and, when ice cover allows for movement between the islands, it also invades the NWA's other islands spreading out from the population "hubs" (Bédard, 2010).

The Muskrat and the American Mink (*Neovison vison*) are present in the wildlife area, especially on Île aux Fraises and Île Blanche. The Snowshoe Hare is also present. Intense grazing by this species has decimated or eliminated an assemblage of the NWA's forest plants that characterize similar communities on the mainland (Bédard et al., 1997b in Bédard, 2010). The White-tailed Deer (*Odocoileus virginianus*) was spotted on several occasions swimming various distances off the shore of the NWA. A juvenile moose (*Alces americanus*) wintered on Le Gros Pèlerin (outside the reserve) in 1986-1987 (CWS, 2003) and another individual was observed on La Grande Île (within the area's boundaries) in 2012 (Jean Bédard, pers. comm., 2012).

During a survey of micromammals conducted in 2007 by the CWS on several of the NWA's islands, only the Meadow Vole (*Microtus pennsylvanicus*) was captured on Île de la Providence, Île Brûlée and La Grande Île in the Kamouraska archipelago (S. Giguère, pers. comm., 2012). No micromammals were captured on Île Bicquette, Île aux Fraises, or Île Blanche. During a survey conducted in 1995, the Meadow Vole was also identified on the portion of Le Long Pèlerin that is within the NWA (Nadeau *et. al.*, 2009). This same survey identified several species of micromammals on some of the islands in the estuary that are not part of the NWA, including the Masked Shrew (*Sorex cinereus*), the Deer Mouse (*Peromyscus maniculatus*), the Southern Red-backed Vole (*Myodes gapperi*), and the Meadow Vole (Nadeau et al., 2009).

A significant number of Grey Seals (*Halichoerus grypus*) use the NWA as a haul-out site, particularly on the intertidal flats of Île aux Fraises and at the western point of the intertidal flats on Île Blanche. Harbour Seals (*Phoca vitulina vitulina*) also haul out on the Îles de Kamouraska and Les Pèlerins. These two pinniped species coexist in several locations, including the reefs and intertidal flats surrounding Île Bicquette and Île Blanche. Moreover, baby Harbour Seals are observed regularly in May on the shore of several islands (Bédard, 2010). Finally, the brackish and salt waters that surround the NWA's islands are used by several species of cetaceans, including the Beluga Whale (*Delphinapterus leucas*), a permanent resident of the St. Lawrence Estuary, whose population is threatened according to Quebec's *Act respecting threatened and vulnerable species* (ARTVS) and Canada's *Species at Risk Act* (SARA).

2.3 SPECIES AT RISK

Table 5 presents species at risk that carry out part of their life cycle in the NWA (islands and intertidal flats) or in its surrounding waters.

Between 2002 and 2010, the Peregrine Falcon, a species of special concern in Canada, was observed repeatedly on a cliff on Le Long Pèlerin, in the archipelago of Les Pèlerins, where its nesting has been confirmed. In addition, in July and August 2002, the species was observed on a few occasions on Le Pot du Phare, in the Brandypot Islands (Bédard, 2002 in CWS, 2003). One or several juvenile Bald Eagles (*Haliaeetus leucocephalus*) and Golden Eagles (*Aquila chrysaetos*) sometimes spend long periods on Le Pot du Phare in June and July (Bédard, 2002 in Bédard, 2010), but no nesting by these species has been confirmed in the NWA. Both are species of special concern in Quebec.

The St. Lawrence Estuary is the main wintering ground for the eastern population of the Barrow's Goldeneye (Robert et al., 2003), a species of special concern in Canada. Its numbers are estimated at a maximum of 4500 individuals, of which at least half find refuge in the estuary during the colder months. The species is then observed in the waters adjacent to Île aux Fraises, Île Blanche, the

Brandypot Islands (a portion of this archipelago is not part of the NWA) and Île aux Lièvres (outside the NWA).

The Red Knot of the *rufa* sub-species is found in the St. Lawrence Upper Estuary and Lower Estuary primarily during fall migration (Aubry and Cotter, 2007). Although this shorebird most likely uses the intertidal flats on the NWA's islands during this period, its presence has not yet been documented. This sub-species is endangered in Canada and is likely to be designated as threatened or vulnerable in Quebec.

The *Centre de données sur le patrimoine naturel du Québec* (CDPNQ, 2012) does not contain any entries of plants, amphibians, reptiles, or mammals at risk (in Canada or Quebec) within the NWA.

Table 5: Species at Risk in Estuary Islands NWA

Common and scientific names of the species	Status		
	Canada		Quebec
	SARA[1]	COSEWIC[2]	ARTVS[3]
Birds			
Peregrine Falcon *Falco peregrinus anatum/tundrius*	Special Concern*	Special Concern*	Vulnerable** or SLDTV***[4]
Barrow's Goldeneye *Bucephala islandica* Eastern Population	Special Concern	Special Concern	Vulnerable
Red Knot *Calidris canutus rufa*	Endangered	Endangered	SLDTV[4]

[1] Canadian *Species at Risk Act* (Species at Risk Public Registry, 2014)
[2] Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2014)
[3] Quebec *Act respecting threatened or vulnerable species* (MDDELCC, 2014)
[4] Species likely to be designated threatened or vulnerable in Quebec (MDDELCC, 2014)
* Status assigned to both *anatum/tundrius* sub-species (*F. peregrinus anatum/tundrius)*
** Status assigned to the *anatum* sub-species
*** Sub-species *tundrius*

2.4 INVASIVE SPECIES

No complete study on invasive species has been conducted in the NWA. However, Morisset's work (2010a, b, c in Bédard, 2010) highlighted the significance of exotic plants (referred to as introduced plants by the author) in open environments on three of the NWA's islands: Île Blanche, Île aux Fraises and Le Pot du Phare (one of the Brandypot Islands). On the first two islands, 35% of the flora is made up of exotic species while 25% of the species on the Brandypot Islands are exotic.

On Île Blanche, one of these plants, the Reed Canary Grass (*Phalaris arundinacea*) invaded the entire surface of the island to the extent that it made up almost the entire herbaceous layer. This plant was sown in 1985 and 1986 on the entire island, except for the coastal belt, during work carried out after the avian cholera epidemic to encourage nesting of the Common Eider (J.-F. Giroux, pers. comm. in Morisset, 2010). The Canada Reedgrass (*Calamagrostis canadensis*), a native grass

species which would be expected to occur here, has not even been observed, possibly owing to the introduction and expansion of the Reed Canary Grass.

On Île aux Fraises, the Purple Loosestrife (*Lythrum salicaria*), an exotic plant considered to be invasive, was found in a single location (a single individual observed south of the western cove); other introduced species such as the Common Timothy (*Phleum pratense*) and the Canada Thistle (*Cirsium arvense*) are distributed throughout the island but are not considered invasive (Morisset, 2010 in Bédard, 2010). On this same island, invasive exotic species like the Wild Radish (*Raphanus raphanistrum*) and the Smooth Bedstraw (*Galium mollugo*) often cover a considerable area. In places, the radish invades the entire area normally occupied by Sea Lymegrass (*Elymus arenarius*) or forms a band up to three metres wide in the zone of typical coastal shoreline plants, such as the Beach Pea (*Lathyrus japonicus*). It seems that this island was used during the early and mid-20th century by farmers from Saint-Siméon who came to graze their livestock. This could explain, in part, the presence of certain exotic species (Bédard, 2010).

On Île aux Lièvres, close to the NWA, small colonies of the Purple Loosestrife and the European Reed (*Phragmites australis,* exotic) have been observed on some shorelines (CWS, 2003).

3 MANAGEMENT CHALLENGES AND THREATS

Estuary Islands National Wildlife Area is exposed to numerous threats and presents several management challenges, including wildlife diseases, habitat degradation, the impact of predators, the impact of human activities, invasive plant species, accidental spills, area fragmentation, facility, infrastructure, and lands maintenance, as well as gaps in scientific knowledge. These are described below in approximate order of importance since the scope of several of them is not well known.

3.1 WILDLIFE DISEASES

The NWA's colonial seabirds are susceptible to animal diseases, which can strike a species or a group of species. The Common Eider is occasionally affected by avian cholera, a bacterial disease that triggers potentially devastating epidemics within the species, such as one that decimated close to 10 000 individuals in 2002 (Giroux et al., 2002 in CWS, 2003). Factors that contribute to this disease and its spread among the Common Eider are still not well understood. An emergency plan in the event of mass bird mortality was put forward by the CWS in order to react to epizootic diseases and to mitigate their impacts.

3.2 HABITAT DEGRADATION

Some of the NWA's animal populations become so abundant at times that they can cause habitat deterioration and affect other species. The increase in the Double-crested Cormorant's population between 1978 and 1990 in the St. Lawrence and the impact of its droppings on the ecosystems of the estuary islands prompted the Quebec Ministère du Loisir, de la Chasse et de la Pêche (MLCP) to launch a species control program in 1989 (Bédard et al., 1995). The CWS is also concerned with the impacts of this species on the evolution of the NWA's habitats and the integrity of bird populations that nest there. Other animals can also disrupt vegetation on the NWA's islands, especially the Snowshoe Hare through its intense grazing (Bédard, 2010). Cyclical insect epidemics periodically affect the NWA's forests, such as the Spruce Budworm epidemic that caused major damage on all of the NWA's islands during the 1970s (CWS, 2003). In the last three years, large areas where trees have blown down have appeared on the south side of Île Bicquette as a result of strong winds (M. Lapointe, pers. comm., 2014).

In recent years, shore erosion, leading to the degradation of coastal habitats (receding by more than 5 m), has been observed on some of the NWA's low-lying islands, especially Île aux Fraises and Île Blanche, where the underlying rock is covered with unconsolidated materials (sand and gravel). This phenomenon has also been observed in the eastern part of Île Bicquette (M. Lapointe, pers. comm., 2014). This erosion could be due to storm frequency and intensity as well as high tides, which can be exacerbated by climate change.

3.3 IMPACT OF PREDATORS

Terrestrial predators can occasionally access the NWA's islands (e.g. by swimming or via ice bridges that form between the mainland and the islands). These predators, especially the Red Fox, and certain species of birds, such as gulls, can significantly reduce colonial seabird populations through egg or chick predation (Bédard, 2010). Although the presence of these predators on the islands and their predation of birds is a natural phenomenon, controlling certain ones, particularly the fox, is occasionally necessary in order to avoid significant impacts on the affected populations of nesting seabirds. Predator control can, however, have repercussions on prey. For example, controlling the Red Fox can promote increased Snowshoe Hare populations, which can result in an increase in the grazing of the islands' vegetation. Predator control is subject to Environment Canada's "Predator Management Policy", which takes into account a series of factors to guide interventions.

3.4 HUMAN IMPACT

Despite regulations prohibiting public access (except on Le Pot du Phare), the presence of boaters and kayakers in the NWA can have harmful consequences for the integrity of ecosystems and successful reproduction among colonial seabirds. Trampling by these visitors can disturb wildlife and degrade riparian habitats and flora. These types of unauthorized activities take place primarily on Le Long Pèlerin, within the NWA's boundaries, where visitors have left their mark (tent prints, fires and garbage). Visitors are also frequently seen on the Îles de Kamouraska (Bédard, 2010), but no records are kept of these sightings.

Resource operations around the NWA (fishing, seaweed and sea urchin harvesting) could also have an impact on NWA's wildlife, such as the Common Eider or the Surf Scoter. A project to develop oil and gas reserves (exploration and production) in the sub-surface of the St. Lawrence, specifically in the basin of the Lower Estuary and the north-western Gulf of St. Lawrence, raises fears about the possible impact these activities might have on wildlife and the environment (AECOM Tecsult Inc., 2010).

Finally, the proposed construction of an oil pipeline and a transshipment could lead to increased maritime traffic and wildlife disturbances and an increased risk of accidental toxic substance spills.

3.5 INVASIVE PLANT SPECIES

No comprehensive studies have been done on the NWA's invasive species, but floral surveys conducted on three islands (Île Blanche, Île aux Fraises and Le Pot du Phare) show that exotic (introduced) plants make up 25 to 35% of the vegetation in these islands' open environments (Morisset, 2010 in Bédard, 2010). Some of these species are invasive or cover large areas, including

the Reed Canary Grass, the Wild Radish and the Smooth Bedstraw, and can result in loss of biodiversity and natural habitats (Bédard, 2010).

3.6 ACCIDENTAL SPILLS

A large number of commercial and passenger cruise vessels travel close to the NWA on the St. Lawrence Seaway every year. An accidental oil or chemical spill in the estuary could result in aquatic bird mortality and have serious consequences for the NWA's shores and ecosystems. Environment Canada and its collaborators have established an emergency response plan (ERP) to implement relevant bird protection measures if such a spill were to occur.

3.7 NWA FRAGMENTATION

The NWA's management and conservation challenges are, in large part, related to its geography. The NWA forms a discontinuous entity made up of islands and portions of islands interspersed with other islands or parts of islands that are not part of the NWA. Some of the islands without NWA status are protected, but others are inhabited or used as vacation spots and could be developed and exploited. For example, on Île Bicquette, the lighthouse owned by Fisheries and Oceans Canada was recently declared surplus and could be turned into a development project. In addition, the NWA's islands are spread out over a long distance (120 km) and are relatively far from the mainland (2 to 10 km from the coast). This limits the ecological connectivity of both habitats and species, which is already naturally weak in island environments. Finally, the NWA's discontinuity, sprawl and remoteness make posting its boundaries, monitoring the area and law enforcement challenging.

3.8 FACILITY, INFRASTRUCTURE AND LAND MAINTENANCE

The NWA has some facilities and infrastructure that require maintenance and restoration, including trails, boardwalks and stairs on Le Pot du Phare, and some buildings (former lighthouse keeper's house, foghorn building, pump building and boathouse) and a cross on Île Bicquette. In addition, rehabilitation work are necessary on Île Bicquette, Le Pot du Phare, Le Long Pèlerin, La Grande Île and Île de la Providence due to the presence of garbage and small quantities of contaminants left behind before the NWA was created.

3.9 GAPS IN SCIENTIFIC KNOWLEDGE

Since its creation, the NWA has been the subject of several surveys by the CWS and Société Duvetnor. However, gaps remain in the scientific knowledge regarding habitats, flora, plant species at risk, certain animals (including amphibians and reptiles), and threats to the NWA's integrity. Ecological monitoring of the NWA and more knowledge is required to support habitat and species management as well as conservation decisions, such as those concerning the decreasing population of Common Eiders in the estuary.

4 GOALS AND OBJECTIVES

4.1 VISION

Estuary Islands National Wildlife Area protects habitats that are important for species at risk, priority bird species, particularly colonial seabirds, and other wildlife. Priority bird species are those mentioned in the Bird Conservation Strategy for Bird Conservation Region 14, Quebec Region: Atlantic Northern Forest (Environment Canada, 2013b).

4.2 GOALS AND OBJECTIVES

The goals and objectives below elaborate on the vision for the management plan and take into account management threats and challenges. Achieving these goals and objectives will result in the implementation of the actions presented in Table 6 (Management Approaches for Estuary Islands NWA), which will be carried out according to the resources available.

Goal 1: Protect and improve habitats that are important to species at risk, priority bird species and other wildlife.

Objectives:

1.1 Protect colonial seabird populations by restricting natural pressures linked to wildlife diseases, abundant animal populations and terrestrial predators;

1.2 Conserve the NWA's seabird colonies, and waterfowl and shorebird staging areas by limiting the effects of human activity (disturbances, accidental spills, etc.);

1.3 Implement the management and recovery measures required to protect bird species at risk and priority bird species;

1.4 Prevent the proliferation of invasive plant species;

1.5 Evaluate erosion of the islands and limit its impact.

Goal 2: Reduce the impact of human activities on the NWA.

Objectives:

2.1 Adequately mark the NWA's boundaries in the field, so as to protect wildlife and plants from the impacts of human activity (disturbances from boaters, hunting, etc.);

2.2 Promote local and public awareness of the NWA's mission and applicable regulations to reduce instances of non-compliance;

2.3 Communicate concerns to managers of adjacent lands and waters regarding resource development near the NWA;

2.4 Ensure that Environment Canada's facilities, infrastructure and lands (especially on Île Bicquette and Le Pot du Phare) are in good and safe condition.

Goal 3: Consolidate the NWA's land holdings and promote the conservation of natural habitats on adjacent islands.

Objectives:

3.1 Incorporate into the NWA adjacent, federally-owned lands with significant conservation value;

3.2 Determine which of the islands located near the NWA have strong conservation potential and develop an acquisition strategy as required;

3.3 Encourage use of the islands and lands adjacent to the NWA in a way that is compatible with the NWA's conservation mandate.

Goal 4: Ensure ecological monitoring of the NWA and improve knowledge about its wildlife and their habitats.

Objectives:

4.1 Develop and implement an ecological monitoring plan;

4.2 Determine gaps in scientific knowledge and address those that are identified as priorities.

4.3 EVALUATION

An annual review of the steps taken and the results achieved will be conducted depending on the availability of financial and human resources. This review will help to identify future priorities for action and resource investment. The management plan itself will be re-evaluated five years after its initial approval and will be reviewed and updated every decade thereafter.

Table 6: Management approaches for Estuary Islands NWA

Goals	Objectives	Actions (Priority Level[1])
Goal 1: Protect and improve habitats that are important to species at risk, priority bird species and other wildlife. **Threats and challenges:** • Wildlife diseases • Habitat degradation • Impact of predators • Human impact • Accidental spills • Invasive plant species	**Objective 1.1:** Protect colonial seabird populations by limiting natural pressures linked to wildlife diseases, abundant animal populations and terrestrial predators.	• Continue to monitor the estuary's seabird populations every five years and implement the protection measures recommended by EC CWS specialists. **(1)** • Monitor the Common Eider every three years on major islands (especially Île Bicquette, Île Blanche and Île aux Fraises) during significant population declines to avoid losses of birds. **(1)** • Continue to monitor the Common Eider during down collection and attempt to understand the factors that have contributed to the decline in the estuary's population over the past 25 years. **(1)** • Monitor the health of bird populations by annually maintaining the emergency plan in the event of mass bird mortality and respond quickly with collaborators in the event of disease. **(1)** • Evaluate and optimize the quality of forest habitat for nesting of the Common Eider on Île Bicquette. **(1)** • In collaboration with others, evaluate the status of abundant bird populations (cormorants, gulls) as needed and their impacts on habitats, and take appropriate management actions. **(3)** • Control predators (especially the fox) to avoid losses of birds in major seabird colonies. **(1)**
	Objective 1.2: Conserve the NWA's seabird colonies, and waterfowl and shorebird staging areas by limiting the effects of human activities (e.g. disturbances, accidental spills).	• Produce and post or distribute information posters and pamphlets intended for kayakers and boaters on the piers in Rivière-du-Loup, Kamouraska, Saint-Fabien and Saint-Siméon to limit disturbances to seabirds, waterfowl and shorebirds in the NWA. **(2)** • Map the NWA's sensitive wildlife habitats and participate in implementing the EC CWS emergency response plan to protect wildlife and sensitive habitats. **(2)**
	Objective 1.3: Implement the management and recovery measures required to protect bird species at risk and priority bird species.	• Protect the identified critical habitat for species at risk and habitats that are important for priority bird species. **(2)** • Apply the measures suggested in the planning documents for the recovery of bird species at risk that are common in the NWA or that nest there (e.g. Peregrine Falcon). **(2)**
	Objective 1.4: Prevent the overgrowth of invasive plant species.	• Assess the impact of invasive plant species. **(2)** • Implement measures to restrict their growth. **(2)**
	Objective 1.5: Evaluate island erosion and limit its impact.	• Assess erosion on the shores of the NWA's low-lying islands. **(2)** • Implement adequate measures to reduce island erosion. **(3)**

Table 6: Management approaches for Estuary Islands NWA (continued)

Goals	Objectives	Actions (Priority Level[1])
Goal 2: Reduce the impact of human activities on the NWA. **Threats and challenges:** • Human impact • Facility, infrastructure and land maintenance	**Objective 2.1:** Adequately post the NWA's boundaries in the field to protect wildlife and plants from the impacts of human activities (disturbances from boaters, hunting, etc.).	• Improve signage on the NWA's boundaries by making signs more visible and by installing them in strategic locations throughout the NWA to prevent people from landing on the islands. **(1)**
	Objective 2.2: Promote local and public awareness of the NWA's mission and applicable regulations to reduce instances of non-compliance.	• Install regulatory signage inside and outside the NWA. **(1)** • Issue public notices of the NWA's regulations in newspapers and share general information about it (in newspapers, magazines, pamphlets, etc.). **(1)** • Share information on the NWA's importance with regional organizations, local communities and the public, in cooperation with different stakeholders. **(3)** • Target the necessity of monitoring, bird and wildlife protection, and law enforcement in the area with regards to prohibiting access and hunting during critical periods. **(2)** • Support area monitoring by Wildlife Enforcement Directorate officers and provincial conservation officers. **(2)**
	Objective 2.3: Communi-cate concerns to managers of adjacent lands and waters regarding resource development near the NWA.	• Participate in regional round tables dealing with resource development around the NWA, including fishing, seaweed harvesting and oil and gas exploration and production. **(3)**
	Objective 2.4: Ensure that Environment Canada's facilities, infrastructure and lands (especially on Île Bicquette and Le Pot du Phare) are in good and safe condition.	• Assess and perform required maintenance. **(1)** • Characterize and assess the level of risk on contaminated sites, including on Île Bicquette, La Grande Île, Le Long Pèlerin and Île de la Providence, and rehabilitate them, if required. **(2)**
Goal 3: Consolidate the NWA's land holdings and promote the conservation of natural habitats on adjacent islands. **Threats and challenges:** • NWA fragmentation	**Objective 3.1:** Incorporate into the NWA adjacent, federally-owned lands with significant conservation value.	• Evaluate whether federally-owned lands could be integrated into the NWA. **(2)** • Take the steps required to integrate these lands into the NWA. **(3)**
	Objective 3.2: Determine which of the islands located near the NWA have strong conservation potential and develop an acquisition strategy as required.	• Conduct an analysis of the ecological value and conservation potential of the islands as well as the portions of islands adjacent to the NWA. **(2)** • When possible, acquire lands with strong conservation potential. **(3)**
	Objective 3.3: Encourage use of the islands and lands adjacent to the NWA in a way that is compatible with the NWA's conservation mandate.	• Make adjacent land owners aware of the importance of protecting the habitat, especially in the Île Bicquette and Îles de Kamouraska sectors. **(2)** • Work in cooperation with other island owners and users to conserve the estuary's islands. **(3)**

Table 6: Management approaches for Estuary Islands NWA (continued)

Goals	Objectives	Actions (Level of priority[1])
Goal 4: Ensure ecological monitoring of the NWA and improve knowledge about its wildlife and their habitats. **Threats and challenges:** • Gaps in scientific knowledge	**Objective 4.1:** Implement an ecological monitoring plan.	• Determine the indicators and follow-up methodologies for an ecological monitoring plan. **(1)** • Implement the ecological monitoring plan. **(1)**
	Objective 4.2: Determine gaps in scientific knowledge and address those that are identified as priorities.	• Determine the gaps in scientific knowledge. **(2)** • Support the acquisition of knowledge of prime importance on priority birds, species at risk, stresses, sensitive habitats and threats to the NWA based on the knowledge acquisition plan. **(3)** • Use various existing data sources (e.g. ÉPOQ, SOS-POP, NGOs, ornithology clubs, research) to improve scientific knowledge. **(3)**

[1] Level of Priority: 1 (from 0 to 3 years); 2 (from 4 to 6 years); 3 (from 7 to 10 years)
Note: The levels of priority assigned to the actions relate to the implementation schedule and not the significance for resource conservation. They can change depending on the context and the available resources.

5 MANAGEMENT APPROACHES

This section summarizes the approaches and actions presented in Table 6 and that are likely to be used in managing Estuary Islands NWA. Management actions will be indicated in more detail during the annual planning process and will be implemented depending on available financial and human resources and according to the approaches described below.

5.1 HABITAT MANAGEMENT

Habitat management will be aimed first at protecting plant communities. In some cases, restoring disturbed habitats (e.g. by the Double-crested Cormorant, the Snowshoe Hare and insects) or rehabilitating contaminated lands can be carried out to preserve natural environments, to mitigate the impacts of disturbances on plant biomass and plant succession in terrestrial environments, or to re-establish seabird populations (e.g. reforestation on Île Bicquette for the Common Eider population) and species at risk.

Integrating federal lands without NWA status as well as other islands of conservation significance into the current NWA could also help preserve wildlife habitats.

5.2 WILDLIFE MANAGEMENT

Wildlife management will be based on the knowledge gained during surveys that have been completed to date. This knowledge will help in taking stock of many components of the NWA's biodiversity and in making informed decisions.

Direct predator control could continue on some islands to protect seabird colonies, while taking into consideration the guidelines in Environment Canada's "Predator Management Policy". If needed, specific management measures will be taken (e.g. installing nest boxes, protecting nesting areas) in order to protect seabird populations (including the Common Eider) whose numbers have been reduced due to wildlife diseases, predation, accidental spills and other factors.

To protect species at risk, the presence and abundance of the Peregrine Falcon and the Red Knot will need to be better documented. The recovery strategies for these species at risk will guide conservation activities in the NWA. Collaboration with other specialists, departments and universities will also be favoured in order to promote learning and the protection of these species.

5.3 MONITORING

An ecological monitoring plan for the NWA will be developed in the next five years to evaluate the NWA's health and to gather information that will help in making management decisions. This plan will be based on biological monitoring carried out by Environment Canada's CWS and could include collaboration with regional and provincial partners. Ecological monitoring efforts will deal mostly with habitats (e.g. forests stressed by cormorant droppings, habitat dynamics), species at risk, species

representative of the NWA, and ecological and human stresses affecting the area. Efforts may also be made to standardize certain methods used to survey nesting seabirds in the NWA. In addition, some specific monitoring programs conducted by the CWS or external organizations could continue in the coming years, such as the CWS' seabird inventory program and the emergency plan in the event of mass bird mortality.

5.4 RESEARCH

Knowledge acquisition and research needs have been established for several groups of species and various management issues in the *Conservation Plan of the Îles de l'estuaire National Wildlife Area* (CWS, 2003). Since then, various surveys have been performed in the NWA and have helped to address certain gaps. These priorities include better documenting the presence of rare or at-risk plant species, certain management problems (e.g. diseases affecting the Common Eider, the progressive reduction of its population over the past 25 years and the status of the forest on Île Bicquette) as well as ecological stresses and the impacts of human activities (e.g. waterfowl hunting, the extent of marine organism harvesting around the NWA and the presence of invasive species). In addition, it would be helpful to improve knowledge about certain elements of the NWA's biological diversity (e.g. insects, algae, aquatic plants, amphibians, reptiles, plant life, habitats, shorebirds as well as the nesting and breeding of waterfowl).

Permits can be issued for research activities that are aligned with the priorities identified in the management plan and for scientific activities such as surveys, habitat restoration and enhancement works.

For permission to conduct research in Estuary Islands NWA and for instructions on the guidelines for a research proposal, please contact:

National Wildlife Area – Research Request
Environment Canada
Canadian Wildlife Service
Québec Region
801-1550 d'Estimauville Avenue
Québec QC G1J 0C3
Email: permisSCFQuebec@ec.gc.ca

5.5 PUBLIC INFORMATION AND OUTREACH

Estuary Islands NWA is not open to the public, except Le Pot du Phare, where Environment Canada allows public outreach activities about conserving natural environments. These activities are currently carried out by Société Duvetnor Ltée, a local conservation organization, under a commercial permit issued by the CWS. Various public education and outreach measures are planned to prevent

boaters and kayakers from landing in the NWA and to limit disturbances to wildlife. These measures include improving signage on the NWA's boundaries as well as distributing pamphlets, installing posters and signs, or publishing notices that present general information about the NWA and its applicable regulations.

6 AUTHORIZATIONS AND PROHIBITIONS

In the interest of wildlife and their environment, human activities are minimized and controlled in NWAs through the implementation of the *Wildlife Area Regulations*. These regulations set out the activities that are prohibited (subsection 3(1)) in the wildlife area and provide mechanisms for the Minister of the Environment to authorize certain activities to take place in NWAs that are otherwise considered prohibited. The regulations also provide the authority for the Minister to prohibit entry into NWAs.

Activities within an NWA are authorized where notices have been posted at the entrance to or along the boundaries of the NWA or when notices have been published in local newspapers. All activities in an NWA are prohibited unless a notice has been posted or published authorizing the activity to take place (see example in Appendix A). However, in addition to notices, certain activities may be authorized by obtaining a permit from the Minister of the Environment.

6.1 PROHIBITION OF ENTRY

Under the *Wildlife Area Regulations*, the Minister may publish a notice in a local newspaper or post notices at the entrance of any NWA or on the boundary of any part thereof prohibiting entry to any NWA or its boundaries. These notices can be issued when the Minister is of the opinion that entry is a public health and safety concern or may disturb wildlife and their habitats.

Owing to the fragility of the area and the species that are found there, **access to Estuary Islands NWA is prohibited at all times, except on Le Pot du Phare, unless authorized by a permit issued by the Minister**.

Notices prohibiting entry appear on signage in various locations in the area.

6.2 AUTHORIZED ACTIVITIES

Public access to Estuary Islands NWA is permitted only on Le Pot du Phare, but only after the seabird nesting period, which ranges from mid-July to mid-October, and is conditional on using the transportation service provided by the agency authorized by Environment Canada. Visitors must comply with all other restrictions unless they hold a permit issued by the Minister.

The following activities are authorized only on Le Pot du Phare: accommodating visitors, nature interpretation and observation, hiking, photography, and picnicking in designated locations. These activities are permitted only on the paths on Le Pot du Phare and at the facilities and infrastructure provided for that purpose, such as look-outs and service areas, and only during authorized periods. In addition, eiderdown collection by certain conservation organizations is authorized under a commercial permit issued by Environment Canada.

Other Activities

Any activity, other than those permitted on Le Pot du Phare, is prohibited in the NWA, including hunting, camping, hiking, photography and picnicking.

A notice specifying the types of activities permitted in Estuary Islands NWA was published in local newspapers in 2011 (see Appendix I).

Note: If there is a discrepancy between the information presented in this document and the notice, the notice prevails as it is the legal instrument authorizing the activity.

6.3 AUTHORIZATIONS

Permits and notices authorizing an activity may be issued if the Minister is of the opinion that the activity is scientific research relating to wildlife or habitat conservation; or the activity benefits wildlife and their habitats or will contribute to wildlife conservation; or the activity is not inconsistent with the purpose for which the NWA was established and is consistent with this management plan.

The Minister may also add terms and conditions to permits in order to minimize the impact of an activity on wildlife and wildlife habitats.

All requests for permits or authorizations must be made (in writing or online) to the following address:

National Wildlife Area – Permit Request
Environment Canada
Canadian Wildlife Service
Quebec Region
801-1550 d'Estimauville Avenue
Québec QC G1J 0C3
E-mail: permisSCFQuebec@ec.gc.ca

For further information, please consult the Policy when Considering Permitting or Authorizing Prohibited Activities in Protected Areas Designated under the *Canada Wildlife Act* and *Migratory Bird Convention Act, 1994* (December 2011). This Environment Canada policy document is available on the Protected Areas website at www.ec.gc.ca/ap-pa.

6.4 EXCEPTIONS

The following activities do not require a permit or authorization:

- Activities related to public safety, public health or national security, that are authorized under another act of Parliament or activities authorized under the *Health of Animals Act* and the *Plant Protection Act* to protect animal or plant health;
- Activities related to routine maintenance of NWAs, the implementation of management plans and enforcement activities conducted by an Environment Canada officer or employee.

6.5 OTHER FEDERAL AND PROVINCIAL AUTHORIZATIONS

Depending on the type of activity, other federal or provincial permits or authorizations may be required to undertake an activity in this NWA. For more information, please contact the regional office of the appropriate federal or provincial authority.

7 HEALTH AND SAFETY

All reasonable efforts will be made to protect the health and safety of the public including adequately informing visitors of any known or anticipated hazards or risks. Environment Canada staff will also take all reasonable and necessary precautions to protect their own health and safety as well as that of their co-workers. However, visitors (including researchers and contractors) must make all reasonable efforts to inform themselves of risks and hazards, and must be prepared and self-sufficient. Natural areas contain some inherent dangers and visitors must take proper precautions, recognizing that permanent Environment Canada staff neither regularly patrol nor offer visitor safety services in this NWA.

In the case of environmental emergencies, please contact the National Environmental Emergencies Centre at the following telephone numbers:

514-283-2333 or 1-866-283-2333

Incidents or emergency situations can be reported to:

- Environment Canada: 1-800-668-6767 or enviro@info.ec.gc.ca
- Marine salvage (Canadian Coast Guard): 1-800-463-4393/cellular: *16
- Sûreté du Québec (Police): 310-4141/cellular: *4141
- Sécurité civile (Civil Security): 1-866-776-8345/cellular: 911
- SOS-Braconnage (Poaching): 1-800-463-2191
- Environmental emergencies: Environment Canada : 1-866-283-2333 or Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques: 1-866-694-5454
- Forest fire (SOPFEU): 1-800-463-FEUX (3389)
- Local authorities (Police or Fire Department): 911

8 ENFORCEMENT

The management of National Wildlife Areas is based on three acts and the regulations thereunder:

- the *Migratory Birds Convention Act, 1994* and the *Migratory Birds Regulations*;
- the *Canadian Wildlife Act* and the *Wildlife Area Regulations*;
- the *Species at Risk Act*.

Environment Canada's wildlife enforcement officers are mandated to monitor compliance with the acts and regulations on an ongoing basis and to conduct investigations as required.

Here are some examples of activities that, if undertaken without authorization in NWAs, may constitute offences:

- Accessing the site;
- Destroying or disturbing migratory birds, their nests or eggs;
- Possessing a weapon or other instrument that could be used for hunting;
- Picnicking, camping or engaging in any other recreational activity;
- Lighting a fire;
- Removing or damaging any natural artefact, building, fence, poster, sign or other structure;
- Dumping or depositing waste or substances likely to reduce the quality of the natural environment;
- Letting a pet run free.

9 PLAN IMPLEMENTATION

The management plan will be implemented over a 10-year period. Annual work plans will be developed in accordance with priorities and budgets. Depending on available resources and opportunities, some actions may be accelerated, postponed or cancelled. Environment Canada will follow an adaptive management approach. The implementation of the plan will be evaluated five years after its publication, on the basis of the actions identified in Table 6.

10 COLLABORATORS

Collaborations with local agencies and organizations will be favoured for promoting the protection and conservation of wildlife and their habitats in Estuary Islands NWA. Cooperating with local organizations involved in conservation of the area, such as Société Duvetnor Ltée and the Société protectrice des eiders de l'estuaire (SPEE), is essential for the preservation of this isolated protected area in the middle of the St. Lawrence and must continue. Collaborations may also be developed or pursued with universities and research centres to fill scientific knowledge gaps, with the province for the implementation of species-at-risk recovery measures, especially those under provincial jurisdiction, and with non-governmental organizations and municipal authorities to educate the public about the NWA's conservation objectives.

The following is a list of the main organizations that may collaborate in the mission and activities of Estuary Islands NWA.

CEGEP de Rimouski
60 De l'Évêché Street West
Rimouski QC G5L 4H6
Telephone: 418-723-1880
Toll free number: 1-800-463-0617
Fax: 418-724-4961

City of Rimouski
205 De la Cathédrale Avenue
P.O. Box 710
Rimouski QC G5L 7C7
Telephone: 418-724-3171
Fax: 418-724-3183
Email: direction.generale@ville.rimouski.qc.ca

Club des ornithologues du Bas-Saint-Laurent (COBSL)
P.O. Box 66
Rimouski QC G5L 7B7
Email: cobsl@globetrotter.net

Comité ZIP du Sud-de-l'Estuaire (ZIP Committee of Sud-de-l'Estuaire)
88 Saint-Germain Street West, Suite 101
Rimouski QC G5L 4B5
Telephone: 418-722-8833
Fax: 418-722-8831
Email: zipse@globetrotter.net

Fisheries and Oceans Canada
104 Dalhousie Street
Québec QC G1K 7Y7
Telephone: 418-648-2239
Fax: 418-648-4758
Email: info@dfo-mpo.gc.ca (Ottawa)

Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC) (Quebec Ministry of Sustainable Development, Environment and Fight against Climate Change)

Direction générale de l'analyse et de l'expertise régionales et Centre de contrôle environnemental du Québec – Bureau régional (Analysis and Regional Expertise Branch and Quebec Environmental Control Centre – Regional Office)
212 Belzile Avenue
Rimouski QC G5L 3C3
Telephone: 418-727-3511
Fax: 418-727-3849

Direction de la protection de la faune du Bas-Saint-Laurent (Bas-Saint-Laurent Wildlife Protection Branch)
92 2nd Street West, Suite 207
Rimouski QC G5L 8B3
Telephone: 418-727-3710, ext. 402
Fax: 418-727-3735

Pointe-au-Père Local Office
365 Sainte-Anne Boulevard, Suite 1
Rimouski QC G5M 1E8
Telephone: 418-727-3516
Fax: 418-727-3773

Direction des opérations régionales du Bas-Saint-Laurent (Bas-Saint-Laurent Regional Operations Branch)
92 2nd Street West, Suite 207
Rimouski QC G5L 8B3
Telephone: 418-727-3710, ext. 402
Fax: 418-727-3735

Bureau local de Rivière-du-Loup (Rivière-du-Loup Office)
186 Fraser Street
Rivière-du-Loup QC G5R 1C8
Telephone: 418-862-8213
Fax: 418-862-1188

Ministère de l'Énergie et des Ressources naturelles (MRN) (Quebec Ministry of Energy and Natural Resources)
92 2nd Street West, Suite 207
Rimouski QC G5L 8B3
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Fax: 418-727-3735

Municipality of Kamouraska
67 Morel Avenue
Kamouraska QC GOL 1MO
Telephone: 418-492-6523
Fax: 418-492-9789
Email: mychelle.levesque@kamouraska.ca (city manager)

Municipality of Saint-André
122A Principale Street
Saint-André QC G0L 2H0
Telephone: 418-493-2085
Email: munand@bellnet.ca

Nature Conservancy of Canada (NCC)
55 Mont-Royal Avenue West, Suite 1000
Montreal QC H2T 2S6
Telephone: 514-876-1606
Toll free number: 1-877-876-5444
Fax: 514-876-7901
Email: quebec@conservationdelanature.ca

Organisme des bassins versants du Nord-Est du Bas-Saint-Laurent (OBVNEBSL)
23 De l'Évêché Street West, Suite 200
Rimouski QC G5L 4H4
Telephone: 418-724-5154 ext. 219
Fax: 418-725-4567
Email: direction@obv.nordestbsl.org

Regional County Municipality of Kamouraska (all islands except Bicquette)
425 Patry Avenue
Saint-Pascal QC G0L 3Y0
Telephone: 418-492-1660
Fax: 418-492-2220
Email: info@mrckamouraska.com

Regional County Municipality of Rimouski-Neigette (Bicquette Island)
23 De l'Évêché Street West, Suite 200
Rimouski QC G5L 4H4
Telephone: 418-724-5154
Fax: 418-725-4567
Email: administration@mrcrimouskineigette.qc.ca

Société Duvetnor Ltée
200 Hayward Street
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Rivière-du-Loup QC G5R 3Y9
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Fax: 418-867-3639
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Société protectrice des eiders de l'estuaire (SPEE)
181 Saint-Paul Street
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Telephone: 418-736-4975

Université du Québec à Rimouski
300 Allée des Ursulines
P. O Box 3300, succ. A
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APPENDIX I: ENVIRONMENT CANADA NOTICE PUBLISHED IN 2011

Environment Canada would like to inform the public that the Estuary Island National Wildlife Area (NWA) - a string of a dozen islands in the middle of the St. Lawrence Estuary in the municipalities of Rimouski, Saint-André and Kamouraska - is a protected area. Since its creation in 1986, the NWA has been protecting wildlife and the nesting sites of migratory birds in the area, especially those of seabird colonies.

To protect this area, the Department is informing visitors to areas around the NWA islands of their obligation to follow certain rules, as dictated by the *Canada Wildlife Act* and its regulations. Anyone who neglects to follow these rules or obey the laws in effect may be subject to fines and prosecution.

Nature viewing and hiking are authorized in designated areas on Le Pot du Phare Island.

Without a permit issued by the Minister, it is strictly prohibited for anyone in the NWA to (see section 3(1) of the *Wildlife Area Regulations*):

- hunt or fish;
- destroy or remove a plant;
- allow any domestic animal to run at large;
- swim, picnic, camp or carry on any other recreational activity or light a fire;
- operate any mode of transportation;
- dump or deposit any trash.

For complete information on all applicable regulations, please consult the *Canada Wildlife Act*, *Wildlife Area Regulations*, *1994 Migratory Birds Convention Act* and *Species at Risk Act* at www.ec.gc.ca.

To file a complaint or report illegal activities, please contact Environment Canada by phone at 1-800-668-6767 or by email at enviro@info.ec.gc.ca.

This notice shall not be construed so as to abrogate or derogate from any Aboriginal treaty or other rights of Aboriginal peoples.