Environment and Climate Change Canada
Environnement et Changement climatique Canada

Baie de L'Isle-Verte National Wildlife Area Management Plan

Canada

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About Environment and Climate Change Canada's Protected Areas and Management Plans

What are Environment and Climate Change Canada protected areas?

Environment and Climate Change 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 the marine and terrestrial environments.

What is the size of the Environment and Climate Change Canada Protected Areas Network?

The current Protected Areas Network consists of 54 National Wildlife Areas and 92 Migratory Bird Sanctuaries comprising close to 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 and Climate Change 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 the attributes for which the protected area was established. Environment and Climate Change 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 of facilities, enforcement of regulations, as well as the maintenance of facilities and infrastructure. Research is also an important activity in protected areas; hence, Environment and Climate Change 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 5 years after the approval of the first plan, and every 10 years thereafter.

To learn more

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

Baie de L’Isle-Verte National Wildlife Area

Baie de L’Isle-Verte National Wildlife Area (NWA) comprises 322 hectares in the form of a 20-kilometre strip along the south shore of the St. Lawrence Estuary, in the municipality of L’Isle-Verte. It was created in 1980 by Environment and Climate Change Canada to protect the L’Isle-Verte intertidal cordgrass marsh and coastal areas which provide important habitats for several waterfowl species, including the American Black Duck, and other wildlife. This protected area includes only part of the L’Isle-Verte Marsh, but it forms a buffer zone between the marsh and areas of more intense human activity to the south. The L’Isle-Verte Marsh is one of the largest cordgrass marshes in southern Quebec, and together with adjacent habitats, it is one of the most important American Black Duck breeding sites in the province. The marsh is designated a wetland of international importance (Ramsar site) and an Important Bird Area (IBA).

The NWA provides a variety of habitats, including marshes, swamps, forests, wildlands (e.g. old fields) and farmlands managed for wildlife purposes. It overlaps with part of the L’Isle-Verte Migratory Bird Sanctuary and is adjacent to federal lands that do not have protected status but are ecologically significant, including the Gros-Cacouna Marsh, in the municipality of Cacouna, and the Tourbière du Plateau de L’Isle-Verte, a peat bog located in L’Isle-Verte. The diversity of habitats favours the year-round presence of wildlife. Over 100 bird species have been recorded in the NWA, many of which may breed there. The Snow Goose, Canada Goose, American Black Duck, Great Blue Heron, Black-crowned Night-Heron and Semipalmated Sandpiper are a few of the species that either stop over in the NWA during their migration or breed there. A large number of raptors and other terrestrial bird species are also found in the NWA. In addition to bird species, the NWA supports mammals, such as the American Porcupine, Red Fox and American Beaver, as well as a number of species at risk or with a precarious status, such as the Short-eared Owl, Bobolink and Hoary Bat.

The NWA is open to the public year-round, but access is restricted to designated areas only. A number of activities are authorized in designated areas, including hiking, nature viewing and photography, picnicking, and hunting.

Baie de L’Isle-Verte NWA is exposed to a number of threats and presents various management challenges, including the impact of human activities, fragmentation of the territory,

development of surrounding lands, degradation of wildlife habitats and wildlife habitat enhancements, maintenance of facilities and infrastructure, and invasion by plant species.

The goals of this management plan are to: 1) protect and enhance significant habitats for species at risk, priority bird species, and other wildlife species; 2) reduce the impact of human activities on the NWA; 3) consolidate the NWA's land holdings and promote the conservation of natural habitats on adjacent lands in order to foster connectivity and better ecological conditions; 4) ensure ecological monitoring of the NWA and improve knowledge on wildlife species and their habitats; 5) raise awareness among the public and regional communities about the conservation of the NWA, wildlife species and their habitats.

This management plan will be implemented over a 10-year period in accordance with 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.*

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1 DESCRIPTION OF THE PROTECTED AREA

Baie de L'Isle-Verte NWA extends approximately 20 kilometres along the south shore of the St. Lawrence Middle Estuary and Lower Estuary in the municipality of L'Isle-Verte, northeast of Cacouna, in the province of Quebec (Figure 1). Covering an area of 322 hectares, the NWA was created in 1980 by Environment and Climate Change Canada to protect an intertidal cordgrass marsh (Figure 2) and coastal areas that provide important habitats for waterfowl species, such as the American Black Duck (*Anas rubripes*), as well as other wildlife.

The NWA has a variety of natural environments, including marshes, swamps, forests, wildlands (e.g. old fields), and farmlands managed for wildlife purposes. It is criss-crossed by a network of rivers and streams and has a number of wildlife habitat enhancements (*aménagements fauniques*). Moreover, it overlaps with the L'Isle-Verte Migratory Bird Sanctuary. It is bordered to the south by Route 132, private farmlands and federal lands that do not have protected status, and to the north by the large intertidal marsh of L'Isle-Verte. Most of this marsh, i.e. an area of roughly 2 840 hectares, is owned by the provincial government (CWS, 2004) and is not part of the NWA. Nevertheless, the NWA forms an important buffer zone between the marsh and areas of more intense human activity to the south. The L'Isle-Verte Marsh is one of the largest cordgrass marshes of southern Quebec and the St. Lawrence Estuary. Marshes located upstream have largely been destroyed or drained for various purposes (agriculture, ports and roads). The L'Isle-Verte Marsh, along with various adjacent areas, forms one of the most important American Black Duck breeding sites in the province. It has been designated a wetland of international importance under the Ramsar Convention and an Important Bird Area (IBA). Table 1 summarizes general information about this NWA.

Table 1: Information on Baie de L'Isle-Verte National Wildlife Area

Protected Area Designation	National Wildlife Area
Province or Territory	Quebec – Municipality of L'Isle-Verte, Regional County Municipality (RCM) of Rivière-du-Loup
Latitude and Longitude	48°01′N and 69°21′W
Size	322 ha
Protected Area Selection Criteria (Protected Areas Manual[1])	Historical: Protection of a cordgrass marsh and coastal areas of the St. Lawrence Estuary for the benefit of various species of waterfowl (particularly the American Black Duck and Snow Goose) and other wildlife. Current: Criterion 1a – The area supports a population of a species or subspecies or a group of species which is concentrated, for any portion of the year. Criterion 1c – The area possesses a high research potential for restoration or enhancement, such migratory bird populations could be increased to meet national population targets. Criterion 2b – The area has special value for maintaining the genetic and ecological diversity of a region because of the quality and uniqueness of its flora and fauna.
Protected Area Classification System (Protected Areas Manual[1])	Category A – Species or critical habitat conservation Category C – Information and interpretation
International Union for Conservation of Nature (IUCN[2]) Classification	Category IV – Habitat/species management area
Order-in-Council Number	PC 1980 – 1479
Directory of Federal Real Property (DFRP) Number	05490, 108388 to 108391 (5 structures or buildings) *http://www.tbs-sct.gc.ca/dfrp-rbif/pn-nb/05490-eng.aspx?qid=14135319*
Gazetted	1980
Additional Designations	The NWA is part of a wetland of international importance (Baie de L'Isle-Verte Ramsar site) and an Important Bird Area (Marais de la baie de L'Isle-Verte IBA). It overlaps part of the L'Isle-Verte Migratory Bird Sanctuary.
Faunistic[3] and Floristic[4] Importance	The NWA is an important stopover site for the Snow Goose, Canada Goose, American Black Duck and several other waterfowl species. Together with certain adjacent natural environments, it is a very important American Black Duck nesting site. It is also used by a number of species at risk.
Invasive Species	The European Reed (exotic) and Purple Loosestrife
Species at Risk	The NWA supports at least six species listed at risk under the federal *Species at Risk Act* (SARA), including the Short-eared Owl and Red Knot, *rufa* subspecies, and nine species that are threatened or vulnerable, or likely to be designated as such, under the Quebec *Act Respecting Threatened or Vulnerable Species* (ARTVS), including the Nelson's Sparrow, Bobolink and Hoary Bat.

Table 1 : Information on Baie de L'Isle-Verte National Wildlife Area (continued)

Management Agency	Environment and Climate Change Canada – Canadian Wildlife Service
Public Access and Use	The NWA is open to the public year-round, but access is restricted to designated areas. The NWA's interpretation centre is located at the Maison Girard. Authorized activities within the NWA are hiking on established trails (total length of roughly 4 km), nature viewing and photography, as well as picnicking. Fall waterfowl hunting is authorized in designated sectors with a migratory game bird hunting permit.

1 Environment Canada, 2005
2 IUCN, 2008
3. Names of vertebrate wildlife species used by MFFP, 2015.
4. Names of plant species used by Brouillet et al., 2010+ (VASCAN, accepted names)

FEDERAL LANDS ADJACENT TO THE NWA

The NWA is located near or is interspersed with federal lands without legally protected status. Covering a total area of 466 hectares, these lands include ecologically significant areas, such as the Gros-Cacouna Marsh, also known as the Gros-Cacouna Marsh Birding Site (*Site ornithologique du marais de Gros-Cacouna*), and the Tourbière du Plateau de L'Isle-Verte, a peat bog located on a plateau in L'Isle-Verte (Figure 1).

GROS-CACOUNA MARSH

An area of 247 hectares of lands without protected status is located roughly 5 kilometres west of the NWA, on a peninsula adjacent to the port of Gros-Cacouna (Figure 3), in the municipality of Cacouna. It includes a large part of the Gros-Cacouna Marsh, namely a diked and partially filled marsh area that is crossed by an access road and has three ponds. The land also includes Gros-Cacouna Mountain, an 80-metre high wooded rock formation. These areas provide very important habitats for many species of birds and other wildlife, and are part of an Important Bird Area (IBA).

TOURBIÈRE DU PLATEAU DE L'ISLE-VERTE (L'ISLE-VERTE PLATEAU PEAT BOG)

Other federal lands without protected status overlaps the Tourbière du Plateau de L'Isle-Verte, a peat bog located on a plateau in the municipality of L'Isle-Verte, south of Route 132. The peat bog covers an area of over 150 hectares (Environment Canada, 2013b; Gratton and Grenier, 1992), of which more than 20 hectares are federally owned. It is a favoured nesting habitat for the American Black Duck (Gratton and Grenier, 1992; Bélanger *et al.*, 1994). Table 2 summarizes general information about the Gros-Cacouna Marsh and the Tourbière du Plateau de L'Isle-Verte.

Table 2: Information on federal lands adjacent to the NWA

Province or Territory	Gros-Cacouna Marsh: Quebec – Municipality of Cacouna, RCM of Rivière-du-Loup Tourbière du Plateau de L'Isle-Verte: Quebec – Municipality of L'Isle-Verte, RCM of Rivière-du-Loup
Latitude and Longitude	Gros-Cacouna Marsh: 47°56′13″N and 69°29′50″W Tourbière du Plateau de L'Isle-Verte: 48°01′28″N and 69°18′17″W
Size	The federal government owns 466 ha of lands without protected status adjacent to the NWA, including 247 ha that encompass a large part of the Gros-Cacouna Marsh (which includes Gros-Cacouna Mountain) and over 20 ha that encompass part of the Tourbière du Plateau de L'Isle-Verte.
Directory of Federal Real Property (DFRP) Number	No real property registered in the directory.
Other Designations	Important Bird Area (Marais de Gros-Cacouna IBA)
Faunistic[1] and Floristic[2] Importance	The Gros-Cacouna Marsh provides a variety of habitats that are very important for various bird species, including shorebirds and a number of species at risk. The Tourbière du Plateau de L'Isle-Verte is a very important American Black Duck nesting site and it supports species at risk.
Invasive Species	Gros-Cacouna Marsh: European Reed (exotic), Purple Loosestrife and Broad-leaved Cattail.
Species at Risk	Gros-Cacouna Marsh: This sector supports at least six species listed at risk under SARA, including the Yellow Rail, Peregrine Falcon and Least Bittern, as well as nine species that are threatened or vulnerable, or likely to be designated as such, under ARTVS, including the Nelson's Sparrow and Hoary Bat. Tourbière du Plateau de L'Isle-Verte: The peat bog supports at least three species listed at risk under SARA: the Canada Warbler, the Common Nighthawk and at least one bat species of the genus *Myotis*. It also supports the Hoary Bat which is likely to be designated threatened or vulnerable under ARTVS.
Management Agency	Environment and Climate Change Canada, Canadian Wildlife Service
Public Access and Use	Gros-Cacouna Marsh: The site is open to the public year-round, but access is restricted to designated areas. Authorized activities are hiking on established trails (total length of roughly 7 km), nature viewing and photography, as well as picnicking. Fall hunting is authorized in designated sectors with a migratory game bird hunting permit.

1. Names of vertebrate wildlife species used by MFFP, 2015.
2. Names of plant species used by Brouillet et al., 2010+ (VASCAN, accepted names).

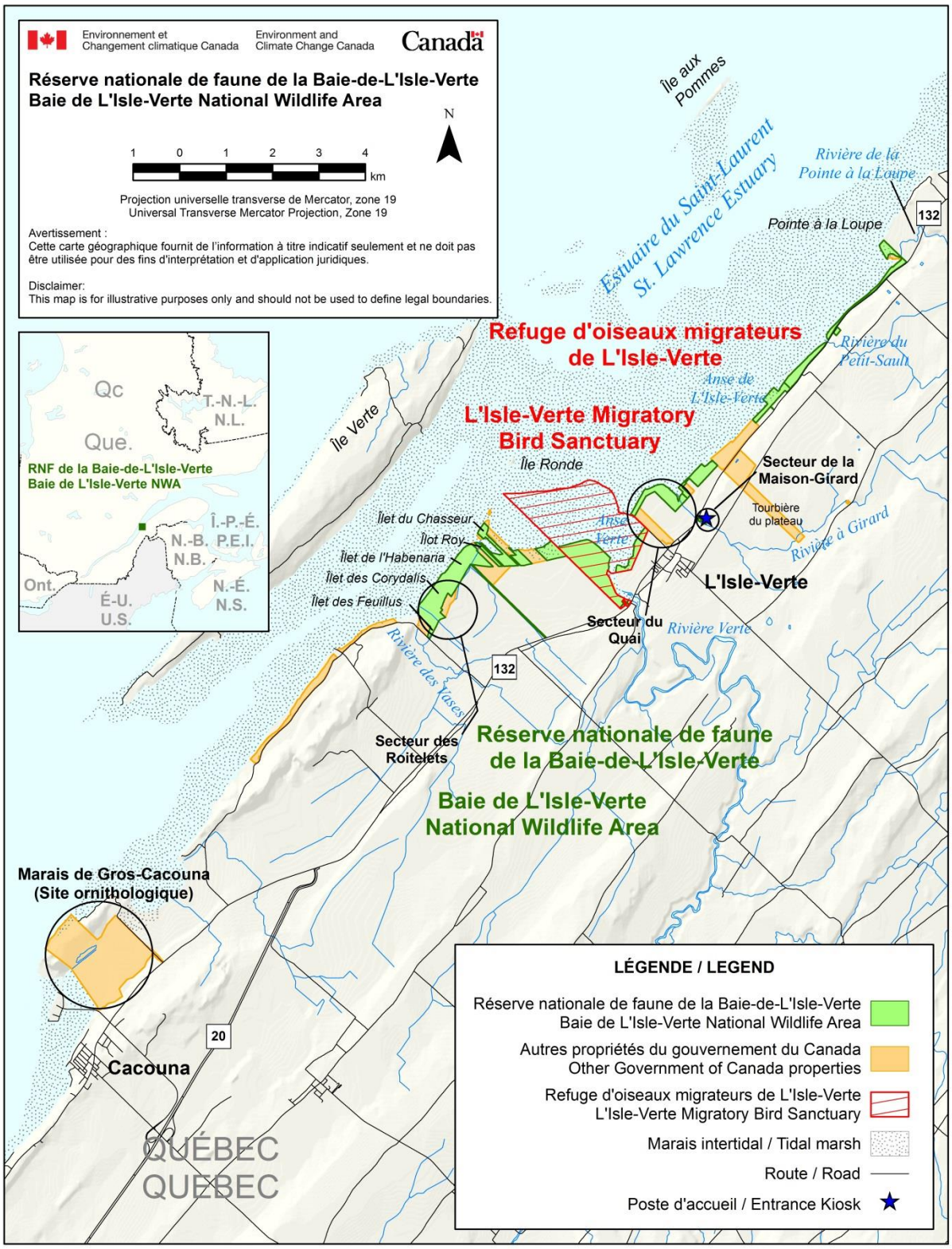

Figure 1: Baie de L'Isle-Verte National Wildlife Area

1.1 REGIONAL CONTEXT

Baie de L'Isle-Verte NWA is located in the municipality of L'Isle-Verte, northeast of Cacouna (Figure 1). This municipality of 1 484 residents is part of the regional county municipality (RCM) of Rivière-du-Loup, one of the eight RCMs forming the Bas-Saint-Laurent administrative region. The economy of the region, which has a population density of only nine persons per square kilometre, is based primarily on the agri-food and forest industries, along with the manufacturing industry and a well-developed service sector. Tourism is also important to the local economy, particularly in summer, when the St. Lawrence River is a major attraction. The tourism industry is largely centred on outdoor activities, such as hiking, cycle tourism, and bird watching.

A number of the above activities are authorized in the NWA. In addition, the NWA and adjacent areas provide a high-quality stopover site for migrating waterfowl. Fall waterfowl hunting, which is popular in the region, is authorized in some parts of the NWA and contributes to the local economy. Between 1994 and 2010, there were an average 1 000 visitors annually to the Maison Girard, the NWA's interpretation centre, although not all visitors to the NWA stop at the interpretation centre (Bachand, 2011).

The new Kiskotuk coastal park is another of the region's ecotourism attractions. The park is dedicated to enhancing the rich wildlife and cultural heritage of the coastal corridor of Cacouna, L'Isle-Verte and Notre-Dame-des-Sept-Douleurs (Île Verte). The boundaries of the regional park encompass private and intramunicipal (public lands within municipal boundaries) lands as well as lands that are part of the NWA and the Gros-Cacouna Marsh. The Société du parc côtier Kiskotuk has recently taken over management of the park. The establishment of the park is an initiative by local stakeholders (the RCM of Rivière-du-Loup, the municipalities of Cacouna and L'Isle-Verte, the Maliseets of Viger First Nation, Corporation PARC Bas-Saint-Laurent and representatives of local farmers, residents and business people), with the cooperation of the Canadian Wildlife Service. The Société du parc côtier Kiskotuk has several objectives, including enhancing the Cacouna–L'Isle-Verte coastal corridor as well as certain areas of Île Verte, promoting the development of the park while ensuring its conservation, improving the services provided to the regional population, fostering the economic development of the local communities and overseeing local involvement.

A number of government and non-government organizations contribute to the mission and activities of Baie de L'Isle-Verte NWA. Over the last 15 years, a local organization, Corporation PARC Bas-Saint-Laurent, has been providing visitor services and carrying out monitoring, maintenance and survey activities, under contracts awarded by the Canadian Wildlife Service (CWS) of Environment and Climate Change Canada.

FEDERAL LANDS ADJACENT TO THE NWA

GROS-CACOUNA MARSH

The Gros-Cacouna Marsh is located in the municipality of Cacouna, which has a population of 1 853 and is part of the RCM of Rivière-du-Loup. The marsh is a regional tourist attraction and a favourite destination of bird watchers. Visitors can enjoy hiking and bird watching on the established trails. Interpretation activities focused on the marsh were carried out between 2002 and 2004, and interpretation panels on species at risk were installed in 2011 by the Maliseets of Viger First Nation, for which Gros-Cacouna Mountain is of considerable importance. Fall migratory bird hunting is authorized in a designated sector of the marsh. Every year, Environment and Climate Change Canada holds a Waterfowler Heritage Day, to allow young people to practise their waterfowl hunting skills and to learn about wildlife conservation before the regular start of the hunting season.

TOURBIÈRE DU PLATEAU DE L'ISLE-VERTE

The Tourbière du Plateau de L'Isle-Verte is a peat bog located in the municipality of L'Isle-Verte. It has been commercially harvested for horticultural peat. Part of the bog (off federal land) is currently being harvested.

Figure 2: Aerial view of the intertidal marsh of L'Isle-Verte and the western part of Baie de L'Isle-Verte National Wildlife Area
Photo: Christine Lepage © Environment and Climate Change Canada, Canadian Wildlife Service

Figure 3: Aerial view of the Gros-Cacouna Marsh (Port of Gros-Cacouna in the foreground)
Photo: Christine Lepage © Environment and Climate Change Canada, Canadian Wildlife Service

1.2 HISTORICAL BACKGROUND

1.2.1 Prehistoric Period

Some 10 000 years ago, the L'Isle-Verte region lay under the waters of a postglacial sea (Dionne, 1977). As the waters receded, the area became habitable. Archaeological sites discovered at Rimouski, and particularly at Bic, date to the Paleo-Indian period (the oldest period of prehistory of the northeastern Americas, from 11 000 to 7 000 years before present) and suggest human occupation of the Bas-Saint-Laurent region over 8 000 years before present (Fortin *et al.*, 1993). Few traces remain of the Paleo-Indians' way of life, but it appears that they lived off hunting, fishing and gathering. A number of sites dating from subsequent periods (the Archaic and Woodlands periods, from 7 000 to 500 years before present) have been discovered in the Bas-Saint-Laurent region. They indicate that, over the centuries, Amerindians used the shores of the postglacial sea and later of the estuary as well as inland areas to hunt for aquatic and terrestrial game (Fortin *et al.*, 1993).

1.2.2 Historic Period

Amerindians and European Contact

At the time of European contact (Historic period, around the 1500s), the Amerindians that inhabited the area that is now southern Quebec belonged to two major groups or linguistic families: the Algonquians (e.g. the Maliseets and Innus or Montagnais) 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). Between 1550 and 1652, the area covering the entire Bas-Saint-Laurent region (between Rivière du Loup and Rivière Matane) and a large part of the North Shore (between La Malbaie, Sept-Îles and Mistassini Lake) was the exclusive preserve of the Innu people. At roughly the same time, the traditional territory of the Mi'kmaq extended from Prince Edward Island to Gaspé. Therefore, present-day Bas-Saint-Laurent was located at the northwestern edge of their territory. The Maliseets inhabited a vast territory covering a large part of what is now New Brunswick, Maine and the Bas-Saint-Laurent, centred around the Saint John River valley (Fortin *et al.*, 1993). They also occupied the south shore of the St. Lawrence, from Lévis to Métis, and the north shore in the vicinity of Tadoussac (MVFN, 2014). These people's way of life was dramatically affected by the arrival of the Europeans (Fortin *et al.*, 1993). The Innu population declined in the mid-17th century (starting in 1652). The Mi'kmaq and Maliseets still had a strong presence in the Bas-Saint-Laurent in the 17th and 18th centuries, but subsequently experienced periods of crisis and decline.

The Maliseets

In the 1800s, the Maliseets, who had lost a large amount of territory to the European settlers, asked the colonial government to transfer the right to the land to them (MVFN, 2014). On May 15 1827, the Executive Council of Lower Canada confirmed the transfer of a territory to the Maliseets of Témiscouata: the Maliseets of Viger reserve, located along the Rivière Verte, near what is now the town of Saint-Épiphane. The 1 214-hectare area was divided into 30 equal-size lots. Seed grain and provisions were distributed to the Maliseet families to facilitate their settlement (Fortin, 2003a). However, the Maliseets were not natural farmers (MVFN, 2014) and seemed to have little interest in subsistence farming (Fortin, 2003a). In the 1850s and 1860s, there was growing pressure to have the Maliseets of Viger reserve returned to the public domain and made available to the settlers. The Maliseets therefore reluctantly consented to return the Viger reserve, which was sold at auction in 1870. Although not all of the Maliseet people inhabited the region, they became even more dispersed after returning the land to the government. In 1875, the government attempted to consolidate them on a new territory at Témiscouata, in Whitworth Township (Fortin, 2003a). However, the land was infertile with no rivers or streams, and the Maliseets stayed there only one winter. In 1891, the government transferred to the Maliseets a small parcel of land at Cacouna—only large enough to accommodate a small number of people (MVFN, 2014). There were never more than a dozen people on the parcel. Thus the Maliseets continued to disperse. Nowadays, some 780 of them live in Quebec. They don't live together as a community but are scattered throughout the province (SAA, 2011).

In 1989, the Maliseets were officially recognized as Quebec's eleventh First Nation. It now has 1 400 active members, most from Quebec. The Maliseets of Viger First Nation is the only Aboriginal community in the Bas-Saint-Laurent and the only First Nation comprising Maliseets in Quebec. It aims at bringing together its population and ensuring its economic development. It still has the territory located in Whitworth Township, near Rivière-du-Loup, and the small parcel of land at Cacouna, which is the smallest Aboriginal reserve in Canada. The Maliseets are very attached to this land, particularly to Gros-Cacouna Mountain (MVFN, 2014).

Colonization and the Seigneurial System

The first settled communities in the Bas-Saint-Laurent region were established under the French seigneurial system (1653-1854), whereby a portion of land was granted to entrepreneurs (seigneurs) for settlement by tenants, known as censitaires or habitants. Between 1653 and 1751, 19 seigneuries were granted in the Bas-Saint-Laurent. The first seigneury was granted at

L'Isle-Verte when, in 1653, Governor Jean de Lauzon granted the seigneury of Rivière aux Saumons (former name of Rivière Verte) to his son Louis. In 1663, the seigneury was granted to Louis Couillard de Lespinay (Fortin, 2003b; Fortin *et al.*, 1993).

During the first half of the 18th century, settlement of the Bas-Saint-Laurent was very slow. The population was concentrated in four seigneuries: Rivière-du-Loup, L'Isle-Verte, Trois-Pistoles and Rimouski. In 1711, Seigneur Jean-Baptiste Côté traded his two seigneuries on Île d'Orléans for the seigneury of L'Isle-Verte. That was an important date in the municipality's history, as it marked the first time a seigneur came to reside permanently at L'Isle-Verte (Fortin *et al.*, 1993). However, even after the British Conquest (1759), the Bas-Saint-Laurent region, located too far away from the centre of the colony, had little appeal for young families who preferred the good farming lands of the Côte-du-Sud (between Beaumont and Kamouraska). The overpopulation of the seigneuries on the Côte-du-Sud eventually led to the settlement of the Bas-Saint-Laurent in the early 1800s (Fortin, 2003b) and to the industrial development of this region. At L'Isle-Verte, industrial development began with the construction of a sawmill and a flour mill in 1819, followed by a second sawmill in 1825 (Mercier *et al.*, 1986).

Agriculture and Drainage of Part of the Intertidal Marsh

Agricultural activities appear to have begun at L'Isle-Verte as early as 1685, when the littoral and the intertidal marsh were used for livestock grazing. A short time later, a primitive drainage network was established in the upper part of the marsh. Under the seigneurial system, the territory was divided into long strips running perpendicular to the St. Lawrence River. The pastures and crops primarily occupied the salt grass and saltmeadow cordgrass marshes (the coastal plain and coastal marsh), as is the case today. However, this system gradually encompassed the lower areas of the intertidal marsh, particularly between Rivière des Vases and Rivière Verte (Patry, 1980, in Mercier *et al.*, 1986).

At the turn of the 20th century, large dikes with aboiteaux—a type of sluice that prevents water from the St. Lawrence from inundating the fields at high tide, but that also allows water to drain from the lands at low tide—were built. Agriculture was then focused on forage crops, the dairy industry and potato production. In the early 1950s, two large dikes were built, one on either side of Rivière Verte, allowing to drain 25 hectares of intertidal marsh. The larger of the two, which measure 1.6 kilometre in length, extend from Rivière à Girard to the wharf. The other, which is roughly 1.4 kilometre long, begin on the west bank of Rivière Verte. The dykes are still there, but a more modern, effective drainage system is now in place (Mercier *et al.*, 1986).

Eelgrass Harvesting

For about half a century—from 1883 to 1929—Eelgrass (*Zostera marina*) was the basis of a flourishing industry in the L'Isle-Verte region. This flowering plant, also known as Seawrack, forms extensive aquatic grassbeds along certain brackish or saltwater littoral zones (Lalumière, 1991). People initially harvested the Eelgrass that naturally washed up on shore and later cut it directly from the tidal flats. In the Rivière des Vases sector, a transshipment dock was constructed and barges that could rest upright at low tide were used. On Rivière Verte, sailboats called "flats" were used (Mercier *et al.*, 1986). Harvested, dried Eelgrass was used as insulation and as a filling material (e.g., car seats). The main supplier sold 3600 tonnes a year. Between 1930 and 1933, most Eelgrass beds in the Atlantic (including those on the U.S. and European coasts, as well as the Maritimes and St. Lawrence Estuary) were decimated by disease. In Quebec, the disease spelled the end of commercial Eelgrass harvesting and had devastating effects on bird life, commercial fisheries and shellfish stocks. The species now appears to be recovering in Quebec (Lalumière, 1991).

National Wildlife Area

Starting in 1973, the Canadian Wildlife Service began to acquire lands that became Baie de L'Isle-Verte NWA on June 6, 1980, under the federal *Wildlife Area Regulations*. The L'Isle-Verte Migratory Bird Sanctuary (MBS) was created in 1986 to protect important migratory habitat for the Snow Goose (*Chen caerulescens*), a large number of duck species, and the Canada Goose (*Branta canadensis*). These two protected areas overlap in the sector of Anse Verte (Figure 1).

The first management plan of Baie de L'Isle-Verte National Wildlife Area was published in 1986 (Mercier *et al.*, 1986). Besides, a conservation plan of this protected area was published in 2004 (CWS, 2004).

FEDERAL LANDS ADJACENT TO THE NWA

GROS-CACOUNA MARSH

Prior to the 1960s, the Gros-Cacouna Marsh was a large intertidal cordgrass marsh that included a wooded island (Gros-Cacouna Mountain). From 1965 on, the site was severely disturbed and fragmented by the activities involved in the construction of the Gros-Cacouna deepwater port (CPBSL, 2013). They included the mining of millions of tonnes of rock from a quarry on the mountain, the filling of part of the marsh, the construction of four retaining dikes and an access road to the dock, and the construction of two long piers, forming a huge basin,

which was dredged. The port was inaugurated in 1981. These projects, which resulted in significant encroachment on the marsh and mountain, caused major physical changes to wildlife habitat, including the drying up of a large part of the marsh and the transformation of Île de Gros-Cacouna into a peninsula (CPBSL, 2013). In the 1990s, marsh restoration and enhancement projects were carried out (Lehoux and Bélanger, 1994).

In 2000, Environment and Climate Change Canada acquired part of the Gros-Cacouna Marsh from Transport Canada through an interdepartmental transfer. The lands, which have no protected status, are of significant ecological value and could one day be made part of Baie de L'Isle-Verte NWA. Steps are being taken in this regard.

TOURBIÈRE DU PLATEAU DE L'ISLE-VERTE

The Tourbière du Plateau de L'Isle-Verte was commercially harvested for horticultural peat until 1980. In 1993, the federal government acquired parcels of land including part of the peat bog. The lands do not have protected status and could one day become part of Baie de L'Isle-Verte NWA.

1.3 LAND OWNERSHIP

The NWA consists of lands acquired by the Government of Canada since the 1970s. A total of 322 hectares are protected by National Wildlife Area status. The intertidal marsh of L'Isle-Verte, located north of the NWA, is largely owned by the province of Quebec (2 480 ha). The federal government owns a small part of the marsh (area unknown) and holds the "shore rights" (hay cutting, hunting and fishing) for a large part of the marsh.

1.3.1 Agricultural Permits

Since the creation of the NWA, some parcels of land located within the NWA and on adjacent federal lands have been leased to local farmers. The Canadian Wildlife Service regulates agricultural activities through five-year permits annually renewable issued under the *Wildlife Area Regulations* (*Canada Wildlife Act*). The total area of lands farmed under such permits is approximately 65 hectares within the NWA and 70 hectares on adjacent federal lands (2008-2012 permits, Figure 4). Agricultural activities are maintained for the purpose of wildlife habitat enhancement and diversification.

FEDERAL LANDS ADJACENT TO THE NWA

The federal government owns 466 hectares of lands adjacent to the NWA that do not have legal protection status.

GROS-CACOUNA MARSH

Part of the federal lands (247 ha) are located in the municipality of Cacouna and encompasses a large part of the Gros-Cacouna Marsh, including the mountain. They are owned by Environment and Climate Change Canada and managed by the Canadian Wildlife Service.

TOURBIÈRE DU PLATEAU DE L'ISLE-VERTE

Some of the federal lands without NWA status are located in the municipality of L'Isle-Verte. Some of it overlaps with the Tourbière du Plateau de L'Isle-Verte, a peat bog that covers over 150 hectares, more than 20 hectares of which are federally owned.

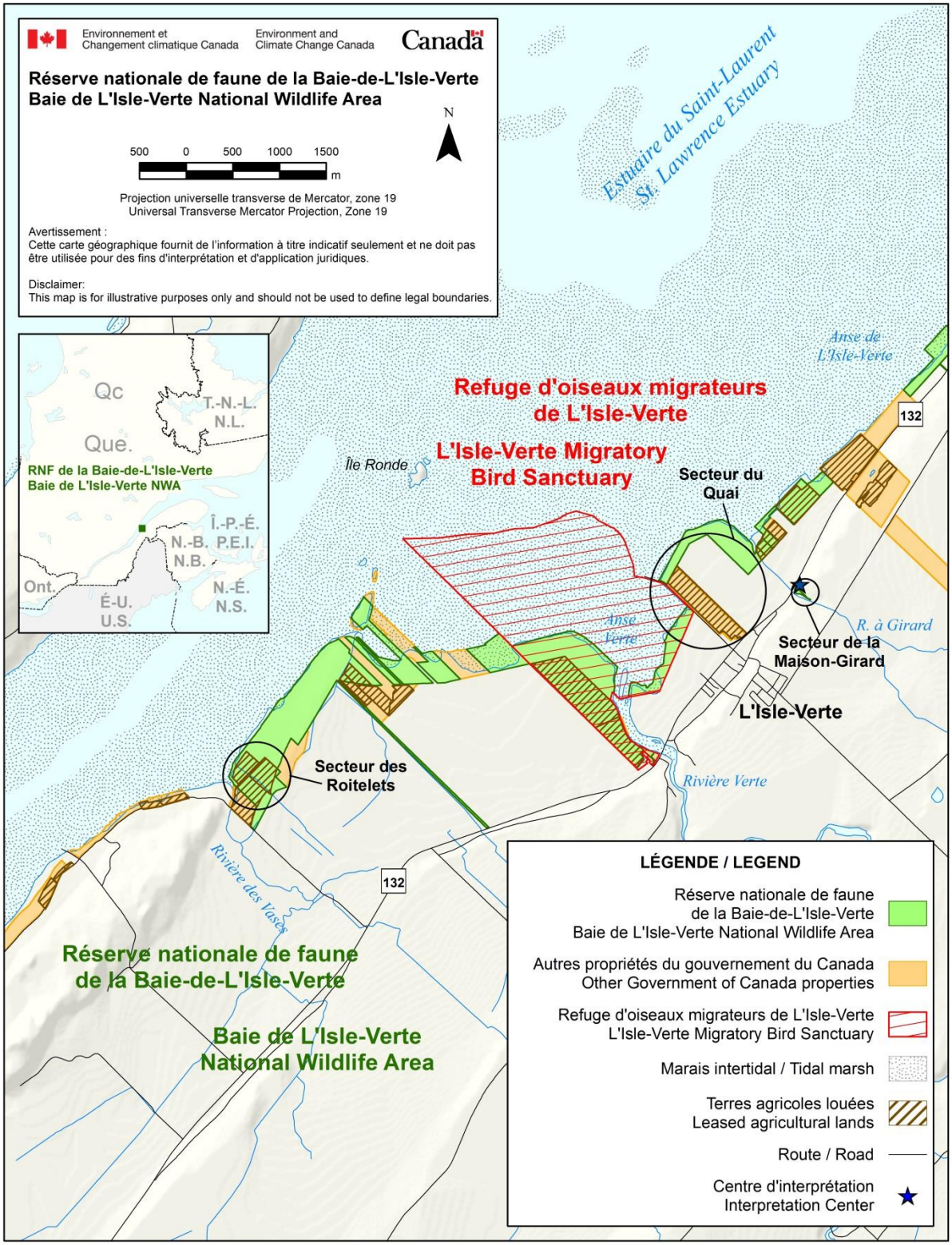

Figure 4: Lands leased under agricultural permits (2008-2012) in Baie de L'Isle-Verte National Wildlife Area and on adjacent federal lands

1.4 FACILITIES AND INFRASTRUCTURE

Baie de L'Isle-Verte NWA comprises various facilities, some infrastructure and several wildlife habitat enhancements (*aménagements fauniques*) (Tables 3 and 4, Figures 5 to 7).

The Maison Girard (Girard House), which is located within the NWA in the east end of L'Isle-Verte, serves as the NWA's interpretation centre (Figures 5 and 6). Over about the last 15 years, Corporation PARC Bas-Saint-Laurent has provided basic visitor services at the interpretation centre under a permit issued for that purpose. The centre houses two permanent exhibits for visitors: one on salt marshes and the other on peat bogs. It also offers films and interpretation activities during the operating season.

A shed next to the Maison Girard and a barn east of the house are used for storing the NWA's maintenance equipment and supplies. Behind the house, a trail about 50 metres long leads to a lookout over the L'Isle-Verte Marsh and the St. Lawrence. The NWA has three hiking trails (Figures 5 and 7) totaling approximately four kilometres and three parking lots: one next to the Maison Girard, one at the start of Les Roitelets Trail and one at the start of La Spartine Trail. Information and interpretive kiosks, interpretive panels, lookouts and observation towers help visitors discover the protected area and surrounding landscape. There are also notices that indicate the location of the NWA, its legal boundaries and applicable regulations.

Various wildlife habitat enhancements have been constructed to create or improve wildlife habitats at certain locations within this protected area (Table 4 and Figure 5), some of which were built in the 1980s by the Canadian Wildlife Service and Ducks Unlimited. For instance, dikes were built to create ponds for waterfowl at the Aboiteau Girard and Roitelet wildlife habitat enhancements. The structures are maintained under agreements between the Canadian Wildlife Service and Ducks Unlimited. The NWA's three hiking trails were established on the dikes.

Table 3: Facilities and infrastructure in Baie de L'Isle-Verte National Wildlife Area

Type of facility or infrastructure	Approximate size	Owner
Maison Girard (Girard House, interpretation centre)	190 m^2	Canadian Wildlife Service
Shed (next to the Maison Girard)	8 m^2	Canadian Wildlife Service
Barn (1.3 km east of the Maison Girard, outside the NWA on an ECCC land with no protection status)	200 m^2	Canadian Wildlife Service
Trail, bench, stairs and lookout (behind the Maison Girard)	50 m (trail)	Canadian Wildlife Service
Trail (sentier) La Digue	0.6 km	Canadian Wildlife Service
Trail (sentier) La Spartine	0.4 km	Canadian Wildlife Service
Trail (sentier) Les Roitelets	2.7 km (loop)	Canadian Wildlife Service
Interpretive kiosk, small bridges (2) and lookout on Sentier de la Spartine	3 m long (bridges) 3 m high (lookout)	Canadian Wildlife Service
Information kiosk, stairs (3), lookouts (2) and small bridge on Sentier des Roitelets		Canadian Wildlife Service
Parking lots (3):		Canadian Wildlife Service
Maison Girard	100 m^2	
Sentier de la Spartine	1 250 m^2	
Sentier des Roitelets	120 m^2	

Table 4: Wildlife habitat enhancements (*aménagements fauniques*) in Baie de L'Isle-Verte National Wildlife Area

Type of work	Approximate size	Owner
Aménagement Salicorne	26 ha	Canadian Wildlife Service
Aménagement Roitelet	52 ha	Canadian Wildlife Service
Aménagement Soucy et Duvetnor (or aménagement de l'aboiteau Soucy)	63 ha	Canadian Wildlife Service
Aménagement du Quai	5 ha	Canadian Wildlife Service
Aménagement Aboiteau Girard	33 ha	Canadian Wildlife Service

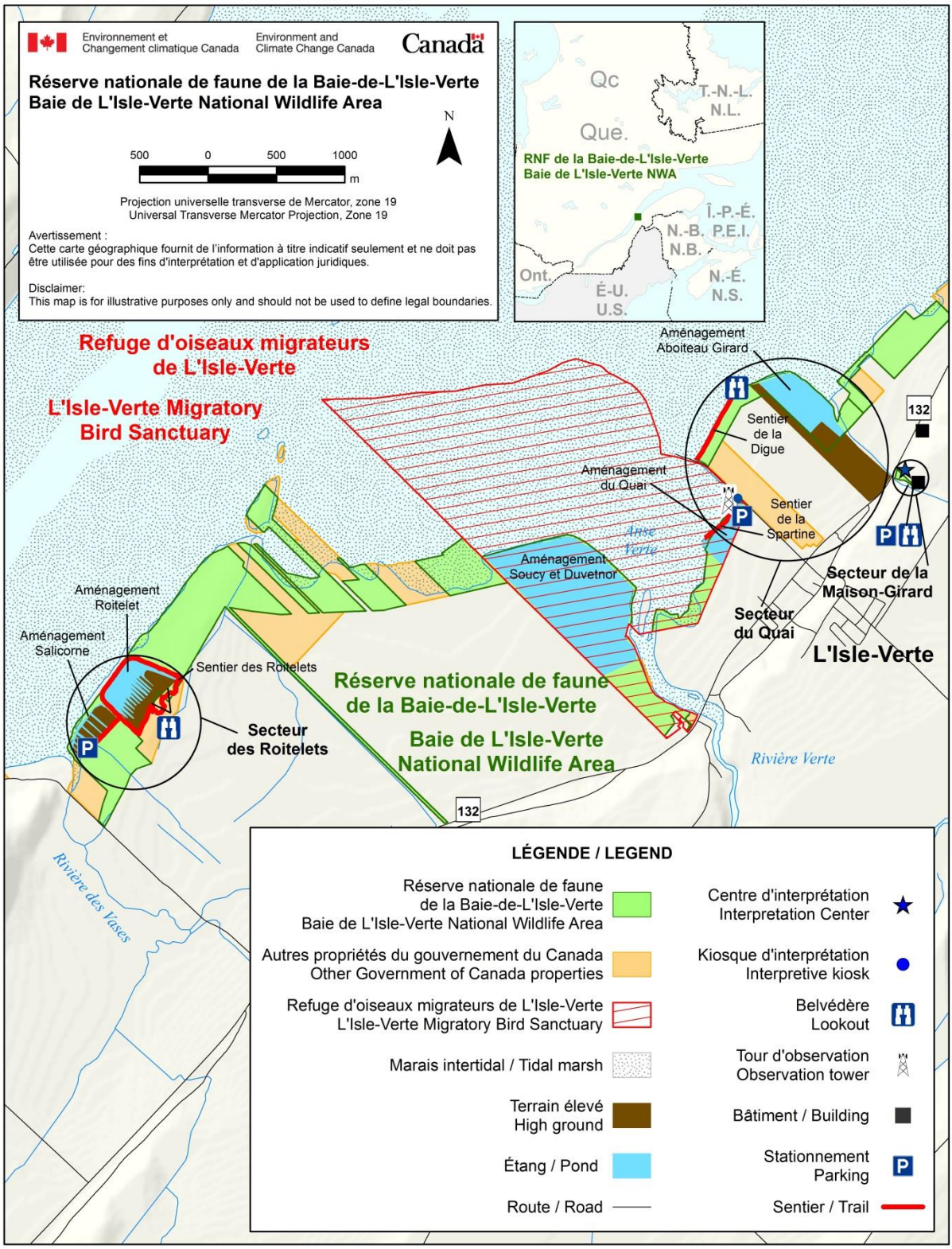

Figure 5: Facilities, infrastructure and wildlife habitat enhancements (*aménagements fauniques*) in Baie de L'Isle-Verte National Wildlife Area

Figure 6: The Maison Girard, interpretation centre of Baie de L'Isle-Verte National Wildlife Area

Photo: Benoît Roberge © Environment and Climate Change Canada, Canadian Wildlife Service

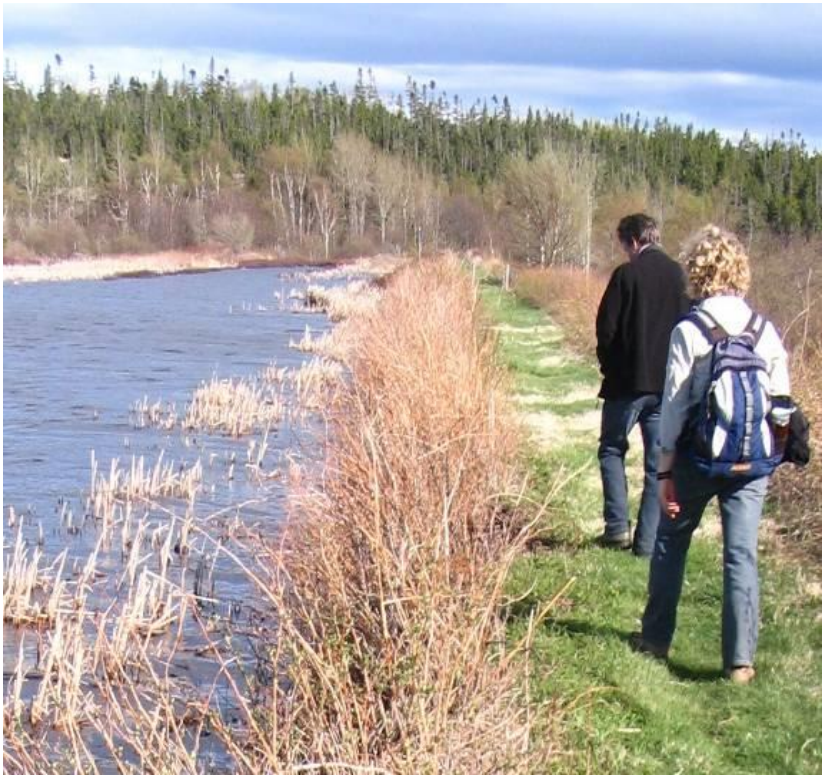

Figure 7: Les Roitelets Trail on the Digue des Roitelets (dike) in Baie de L'Isle-Verte National Wildlife Area

Photo: Benoît Roberge © Environment and Climate Change Canada, Canadian Wildlife Service

FEDERAL LANDS ADJACENT TO THE NWA

GROS-CACOUNA MARSH

The part of Gros-Cacouna Marsh owned by Environment and Climate Change Canada offers a variety of facilities, some infrastructure and several wildlife habitat enhancements (*aménagements fauniques*) (Tables 5 and 6; Figures 8 to 10). A parking lot with a compost toilet and an information kiosk provides access to two trails about seven kilometres long. La Savane Trail has an interpretive kiosk, two observation towers, an observation blind, a shed and picnic tables. La Montagne Trail has a number of wooden stairs, boardwalks and benches. There are many stops where visitors can take in a panoramic view of the St. Lawrence, and a natural observation platform with a wooden railing provides a view over the marsh and the municipality of Cacouna (Figure 9). Environment and Climate Change Canada has also installed signage in the marsh.

Since the construction of the Gros-Cacouna port, various restoration and enhancement projects have been carried out in the diked marsh to create or improve wildlife habitats. Étang du Marais, an artificial pond created in 1995 on backfill, is now eutrophic. Trees have been planted in the area. Étang de la Montagne is a 4.7-hectare basin formed following the construction of the port (CPBSL, 2013). Four resting islets were installed there in 2012 to encourage waterfowl resting and nesting. Étang du Sud-Ouest, 6 hectares in size, was also formed following construction of the port. It is used in the fall by local waterfowl hunters. Lastly, in 2012, a sill was constructed in the northeast part of the marsh by Corporation PARC Bas-Saint-Laurent to ensure an adequate level of water is maintained in the marsh channels in order to offer suitable wildlife habitats.

TOURBIÈRE DU PLATEAU DE L'ISLE-VERTE

There are no facilities, infrastructure or wildlife habitat enhancements in the part of the Tourbière du Plateau de L'Isle-Verte owned by Environment and Climate Change Canada.

Table 5: Facilities and infrastructure at the Gros-Cacouna Marsh

Type of facility or infrastructure	Approximate size	Owner
Trail (sentier) La Savane	3.9 km, loop	Canadian Wildlife Service
Trail (sentier) La Montagne	3 km, loop	Canadian Wildlife Service
Interpretive kiosk, observation towers (2), small bridges (3), shed, picnic tables, interpretive panels and observation blind on La Savane Trail	6 m high (observation towers) 2 m long (small bridges) 50 m long (blind)	Canadian Wildlife Service
Wooden stairs, boardwalks, benches and railing and interpretive panels on La Montagne Trail		Canadian Wildlife Service
Parking lot in the Gros-Cacouna Marsh	1 500 m^2	Canadian Wildlife Service
Information kiosk in the marsh parking lot	10 m	Canadian Wildlife Service
Compost toilet in the marsh parking lot	2.4 m^2	Corporation PARC Bas-Saint-Laurent

Table 6: Wildlife habitat enhancements at the Gros-Cacouna Marsh

Type of work	Approximate size	Owner
Resting and nesting islets for aquatic birds in Étang de la Montagne (4 installed in 2012)	3 m^2	Corporation PARC Bas-Saint-Laurent
Étang du Marais (artificial, created in 1995 on backfill; also called “bassin faunique”)	1.2 ha	Canadian Wildlife Service
Plantings on backfill (in the late 1990s)		Canadian Wildlife Service
Marsh sill (2012)		Corporation PARC Bas-Saint-Laurent

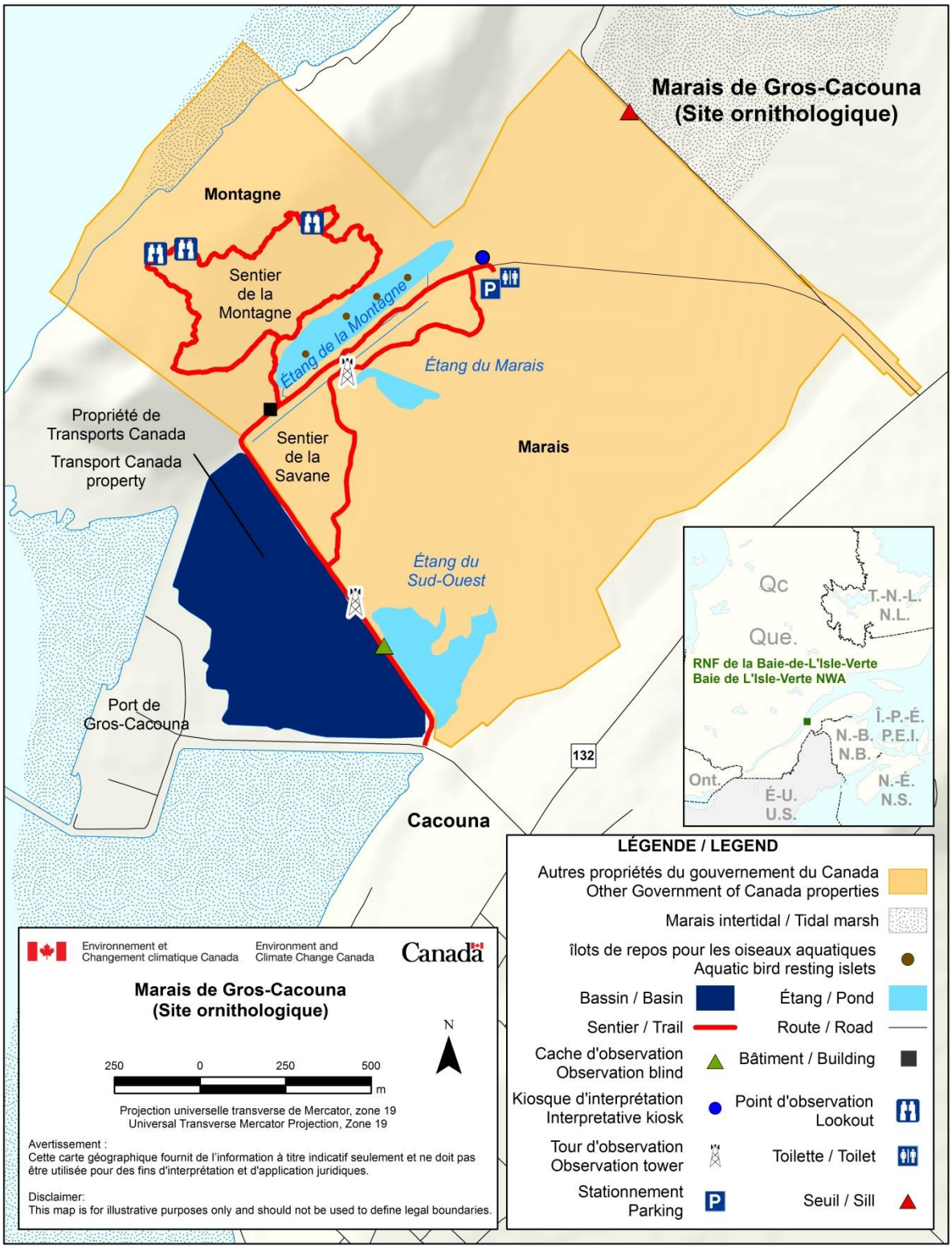

Figure 8: Facilities, infrastructure and wildlife habitat enhancements at the Gros-Cacouna Marsh

Figure 9: View of the Gros-Cacouna Marsh from the south side of the mountain (from bottom to top: Étang de la Montagne, an observation tower on La Savane Trail, Étang du Marais and Étang du Sud-Ouest)

Photo: Benoît Roberge © Environment and Climate Change Canada, Canadian Wildlife Service

Figure 10: Observation tower on La Savane Trail in the Gros-Cacouna Marsh

Photo: Benoît Roberge © Environment and Climate Change Canada, Canadian Wildlife Service

2 ECOLOGICAL RESOURCES

2.1 TERRESTRIAL AND AQUATIC HABITATS

Baie de L'Isle-Verte NWA lies in the Appalachian geological province (MRNF, 2010), which is composed of rocks formed more than 350 million years ago. Situated in the sugar maple–yellow birch bioclimatic domain, it has a cold, humid, marine-influenced climate. In winter, temperatures are colder in the Appalachian highlands than near the St. Lawrence River, whereas in summer, temperatures are cooler near the river (SCOBIV, 1990 in CWS, 2004).

The NWA contains a number of rivers and streams and offers a variety of habitats, including marshes, swamps, forests, wildlands (e.g. old fields) and farmlands managed for wildlife purposes (Maheux-Giroux *et al.,* 2006; Létourneau and Jean, 2006; Grenier, 1989).

2.1.1 Rivers and Streams

A number of rivers and streams run through this protected area. The largest is Rivière Verte, which drains peat bogs and agricultural lands and into which several tributaries flow, including Rivière à la Fourche, Rivière Cacouna and Rivière des Roches. Other smaller rivers run through the NWA and crisscross the NWA's agricultural lands, peat bogs and small forests. They are, from east to west, Rivière de la Pointe à la Loupe, Rivière du Petit-Sault, Rivière à Girard and Rivière des Vases (Repentigny and Mercier, 1988 in CWS, 2004).

2.1.2 Intertidal Marsh

The L'Isle-Verte Marsh (Figure 11) is an intertidal cordgrass salt marsh that is mostly situated on provincially owned land, but part of it is located within the NWA. A description of the marsh based on its dominant vegetation is provided below. The marsh has been divided into four zones based on the frequency of immersion, which is a function of elevation: the mud and algae zone, the Smooth Cordgrass zone, the Saltmeadow Cordgrass zone and the Prairie Cordgrass (or salt grass) zone (Gauthier *et al.*, 1980, whose description is based on the Kamouraska Marsh).

The **mud and algae zone** is flooded at every tide (immersion frequency of 100%) and is characterized by the presence of algae of the genus *Laminaria* (*Laminaria saccharina* and *L. longicruris*) in its lower part and algae of the genera *Ascophyllum* and *Fucus* (*Ascophyllum nodosum* and *Fucus* spp.) in slightly higher areas. Higher still are Eelgrass beds. This zone is characterized by vast muddy, sandy or gravelly flats. The L'Isle-Verte Marsh supports the highest Eelgrass concentrations on the south shore of the St. Lawrence (Lemieux et Lalumière,

1995). The beds are concentrated around Île Ronde and between the mouth of Rivière Verte and Pointe à la Loupe.

The **Smooth Cordgrass zone** is characterized by an immersion frequency of 9% to 100%. In the lower part of the zone, which is the most heavily exposed to tides, the Smooth Cordgrass (*Spartina alterniflora*) is the only species that occurs in abundance owing to its halophilic (salt loving) nature. A pioneer species, it stabilizes loose substrate by means of its dense roots. It also slows the current, resulting in continuous sedimentation and accumulation of nutrients useful to the growth of microscopic algae which form the base of the food web. Conditions in this zone are difficult for plants owing to the large amount of time they are submerged by tides. Eleven other halophiles have been recorded in this zone, including the Virginia Glasswort (*Salicornia depressa ou europaea*), Canada Sand-spurrey (*Spergularia canadensis*) and Seaside Plantain (*Plantago maritima*), but the Smooth Cordgrass is the only species that forms a relatively dense cover. The upper portion of the zone is characterized by small tidal pools, where many animal species occur in abundance, and by patches of vegetation uprooted by spring ice.

The **Saltmeadow Cordgrass zone** is characterized by an immersion frequency ranging from 5.7% to 9%. It is only completely flooded by 5.8-metre tides a few times a month. The Saltmeadow Cordgrass (*Spartina patens*) is the dominant species. It is found in association with other species, including the Saltmarsh Bulrush (*Bolboschoenus maritimus*), Vanilla Sweetgrass (*Anthoxanthum nitens*), Seaside Plantain, and several species of sedges and grasses. This zone also supports other plant communities, such as the Seaside Plantain–Sea Milkwort (*Lysimachia maritima*) group and the Virginia Glasswort–Canada Sand-spurrey group. It contains a large number of tidal pools vegetated with the Sea Ditchgrass (*Ruppia maritima*), and it supports over 20 plant species. In the eastern part of the NWA, the European Lymegrass (*Leymus arenarius*) occurs at Pointe à la Loupe in association with other species, such as the American Sea Rocket (*Cakile edentula*), Western Seabeach Sandwort (*Honckenya peploides*) and Beach Pea (*Lathyrus japonicus*) (addition by Mercier *et al.* 1986 to the description of Gauthier *et al.*, 1980). This zone corresponds to the coastal marsh and is characterized by many salt marsh pools, which are the primary foraging habitat of the American Black Duck and other marsh species.

Lastly, the **Prairie Cordgrass** (or **salt grass) zone** is rarely flooded by tides. Only very large tides of 6 metres and over can partially or entirely submerge this zone. The immersion

frequency ranges from 0% to 5.7%. This zone has the highest plant diversity, with 35 species. There are several dominant species, including the Chaffy Sedge–Red Fescue (*Carex paleacea–Festuca rubra*) group. It also supports the Prairie Cordgrass (*Spartina pectinata*), Mackenzie's Sedge (*Carex mackenziei*), Bluejoint Reedgrass (*Calamagrostis canadensis*) and Canada Burnet (*Sanguisorba canadensis).* This zone corresponds to the coastal plain, which is characterized by a small number of tidal pools.

Figure 11: The intertidal marsh of L'Isle-Verte
Photo: Benoît Roberge © Environment and Climate Change Canada, Canadian Wildlife Service

2.1.3 Farmlands

Some farmlands in the NWA are found in the upper intertidal marsh, part of which was drained for agricultural purposes over the centuries. Approximately 65 hectares within the NWA—or about 20% of its total area—and roughly 70 hectares of federal lands adjacent to the NWA are leased by Environment and Climate Change Canada to farmers under agricultural permits (Figure 12). Agriculture is permitted in order to enhance and diversify wildlife habitats.

The agricultural practices used and the crops grown are based on the biological requirements of wildlife species relating to their migration, breeding or resting. The practices favoured include production of pasture crops, i.e., forage crops, such as clover, alfalfa, and Common Timothy, in rotation with cereal crops, such as barley, wheat, oat and corn. These

types of production are favoured because they provide bird nesting and feeding habitats. The production of canola and soybeans is authorized, but only every four years, because they are less favourable to wildlife.

Figure 12: Land leased under an agricultural permit in Baie de L'Isle-Verte NWA
Photo: Simon Bourbeau © Environment and Climate Change Canada, Canadian Wildlife Service

2.1.4 Wildlands

The NWA contains a number of wildlands, which are covered with relatively disparate vegetation, including herbaceous species, shrubs and some trees. They may consist, for example, of former farmlands (old fields) or marshes.

2.1.5 Swamps

The only swampy areas in the NWA are shrub swamps located around the small wooded islands.

2.1.6 Forests

The primary forest communities in the NWA, typical of a boreal zone, are located between Rivière des Vases and Rivière Verte on four small rocky islands and an islet named, from southwest to northeast, Îlet des Feuillus, Îlet des Corydalis, Îlet de l'Habenaria, Îlot Roy and Îlet du Chasseur (Mercier *et al.*, 1986). The highest part of the islets is characterized by spruce–lichen woodlands typical of the rocky elevations of the St. Lawrence Estuary lowlands. The

woodlands are dominated by the Black Spruce (*Picea mariana*), with the Balsam Fir (*Abies balsamea*), Mountain Maple (*Acer spicatum*), Trembling Aspen (*Populus tremuloides*), Paper Birch (*Betula papyrifera*), Pin Cherry (*Prunus pensylvanica*) and Creeping Juniper (*Juniperus horizontalis*) as companion species. The base of the islets is surrounded by dense alder stands (Patry, 1980 in Mercier *et al.*, 1986).

The understory herbaceous and shrub species include the Common Labrador Tea (*Rhododendron groenlandicum*), Pink Lady's-slipper (*Cypripedium acaule*), Rock Polypody (*Polypodium virginianum*), Bristly Sarsaparilla (*Aralia hispida*), Wild Lily-of-the-Valley (*Maianthemum canadense*) and Large-leaved Aster (*Euribia macrophylla*). The Sheep Laurel (*Kalmia angustifolia*), Mountain Cranberry (*Vaccinium vitis-idaea*), Early Lowbush Blueberry (*V. angustifolium*) and Black Crowberry (*Empetrum nigrum*) are also present, and the bedrock is colonized by many species of mosses and lichens (CWS, 2004).

FEDERAL LANDS ADJACENT TO THE NWA

The NWA is located near or punctuated by federal lands with no legal protection status which include areas with significant ecological value. Some of these areas are described below because they provide important habitats for various wildlife species.

GROS-CACOUNA MARSH

The Gros-Cacouna Marsh is a huge intertidal cordgrass marsh that was significantly altered at the time of the construction of the port of Gros-Cacouna in the 1970s (Lehoux and Bélanger, 1994). The part of the marsh owned by Environment and Climate Change Canada consists of a wooded zone formed by Gros-Cacouna Mountain and a diked marsh zone containing three ponds, a huge embankment and forest stands (Figures 8 to 10). Although the embankment blocks the daily flow of saltwater from the St. Lawrence, this part of the marsh is still considered a saltwater environment because saltwater infiltration does occur (CPBSL, 2013; Environment Canada, 2007). The inflow of freshwater from rain and surrounding lands is favourable to certain plant species that do not normally occur in a cordgrass marsh, such as the Broad-leaved Cattail (*Typha latifolia*), which has invaded part of the marsh (see 2.4 Invasive Species). Étang du Marais is a freshwater pond created in the 1990s, but it has become eutrophic probably because the initial pond wasn't deep enough. The two other ponds formed following the port construction work. Étang de la Montagne is supplied with freshwater from groundwater and precipitation (CPBSL 2013). Étang du Sud-Ouest is replenished with freshwater from precipitation, but it contains traces of salinity from the former salt marsh and salt

spray from the St. Lawrence. The vegetation bordering this pond still includes species typical of an upper salt marsh (CPBSL, 2013).

Gros-Cacouna Mountain is one of the rocky ridges characteristic of the region that geologists refer to as “monadnocks”. Its summit is characterized by a conifer-dominated forest including primarily the Black Spruce, Jack Pine (*Pinus banksiana*) and Balsam Fir, and a shrub understory that includes the Black Crowberry, Early Lowbush Blueberry and Common Juniper (*Juniperus communis*) (Figure 13) (Énergie Cacouna, 2005). Herbaceous species include the Wild Lily-of-the-Valley and Shrubby Cinquefoil (*Dasiphora fruticosa*). At the base of the mountain, on the east and south sides, there is a mixed forest of Balsam Fir and Yellow Birch (*Betula alleghaniensis*) including the Paper Birch, Trembling Aspen and Mountain Maple. Common shrub species include the Common Elderberry (*Sambucus canadensis*), Canada Yew (*Taxus canadensis*), and American Mountain-ash (*Sorbus americana*). Herbaceous species include the Wild Sarsaparilla (*Aralia nudicaulis*), Bunchberry (*Cornus canadensis*), Yellow Clintonia (*Clintonia borealis*), and Wild Lily-of-the-Valley (Énergie Cacouna, 2005).

Figure 13: Forest at the summit of Gros-Cacouna Mountain
Photo: Benoît Roberge © Environment and Climate Change Canada, Canadian Wildlife Service

TOURBIÈRE DU PLATEAU DE L’ISLE-VERTE

The L’Isle-Verte area contains a few peat bogs, including the Tourbière du Plateau de L’Isle-Verte, which is located on a 10-metre high plateau south of Route 132 (Figure 1). This

peat bog was once commercially exploited for horticultural peat, and although commercial peat extraction ended in 1980, the bog still bears the scars left by the drainage and extraction activities. Close to 60% of its area is covered by long series of peat strips separated by drainage channels and access roads (Gratton and Grenier, 1992).

The Tourbière du Plateau de L'Isle-Verte is an important nesting habitat for the American Black Duck, given its proximity to the excellent rearing habitat provided by the St. Lawrence tidal flats (Gratton and Grenier, 1992; Bélanger *et al.*, 1994). An inventory of the peat bog's vegetation cover was conducted to characterize the wildlife habitat (Gratton and Grenier, 1992). Seven plant communities including five shrubland communities and two open forest communities were identified: four types of low heath shrublands (with *Cladonia* Lichen, Paper Birch, Tamarack, and Black Spruce), a tall shrubland consisting of Bartram's Serviceberries (*Amelanchier bartramiana*) and Broad-leaved Meadowsweets (*Spiraea latifolia*), a boggy Jack Pine stand, and a boggy cedar stand. The low heath shrubland with the Paper Birch is the most common plant community. It covers the entire central part of the exploitation area and is the successional stage that follows peat extraction.

2.2 WILDLIFE SPECIES

Wildlife surveys were conducted in Baie de L'Isle-Verte NWA and on adjacent federal lands to collect data and update those collected in the 1970s, 1980s and 1990s (CWS, 2004) on the wildlife resources and species at risk in the NWA and surrounding area. The surveys were conducted in 2005, 2008 and 2009 by the Canadian Wildlife Service (CWS) and the Quebec Department of Natural Resources and Wildlife (MRNF) (Latendresse *et al.*, in prep.). Species recorded at the Gros-Cacouna Marsh, at the Tourbière du Plateau de L'Isle-Verte, and at a number of other areas adjacent to the NWA are also presented in this section.

2.2.1 Invertebrates

Aquatic Invertebrates

Labonté (1984 in CWS, 2004) described the rich diversity of aquatic invertebrates present in the L'Isle-Verte intertidal marsh. These organisms occur primarily in tidal pools and form the base of an intertidal marsh food web. The sandy beaches, mud flats and Eelgrass beds support oligochaetes and polychaetes (*Nereis diversicolor, Arenicola marina*), molluscs (*Buccinum undatum, Mya arenaria*), gastropods (*Hydrobia minuta*), and sand fleas (*Orchestia gammarella*). The crustacean *Gammarus laurencianus* is found under algae, and blue mussels (*Mytilus edulis*) are found attached to rocks.

Insects and Spiders

Little information is generally available about the insects and spiders of the NWA. The many tidal pools are favourable to the presence of insects in the orders Diptera and Hemiptera: *Chironomus* sp., *Ephydra* sp., *Trichocorixa verticalis*, and *Culocoides* sp. (CWS, 2004).

A study of the spider communities in the herbaceous layer of three habitats adjacent to the salt marsh—the land to the east of Rivière des Vases and the wastelands (uncultivable portions) of the upper and lower parts of the Prairie Cordgrass zone—identified 38 spider species in the upper marsh and 24 species in the lower marsh. It also revealed that spider diversity is higher in the fields than in the upper marsh (Bélanger, 1989 in CWS, 2004).

2.2.2 Fish

Four fish species were identified in surveys conducted in the NWA and the Gros-Cacouna Marsh by the CWS and MRNF in 2005 (Latendresse *et al.*, in prep.): the Banded Killifish (*Fundulus diaphanus*), Ninespine Stickleback (*Pungitius pungitius*), Fourspine Stickleback (*Apeltes quadracus*), and Threespine Stickleback (*Gasterosteus aculeatus*). The Banded Killifish was captured only in the Gros-Cacouna Marsh. It was particularly abundant in Étang du Marais (interior basin). The Ninespine Stickleback was the most abundant stickleback, in both the NWA and the Gros-Cacouna Marsh. The Threespine Stickleback was also captured in both sectors. In the Gros-Cacouna sector, it was only found in the outer basin (off federal lands) and in the outlet stream located to the east of the marsh. Lastly, a single Fourspine Stickleback was captured in the surveys, and that was in Rivière aux Vases.

The Common Carp (*Cyprinus carpio*) and the Yellow Perch (*Perca flavescens*), among other species, occur in the rivers flowing through the NWA (SCOBIV, 1990 in CWS, 2004). In waters adjacent to the NWA, some 10 fish species were recorded in two Eelgrass beds near Île Ronde (Lemieux and Michaud, 1995). The fish community was dominated by sticklebacks (especially the Threespine Stickleback) and the Rainbow Smelt (*Osmerus mordax*), followed by flounders (mainly the Smooth Flounder, *Pleuronectes putnami*), the Atlantic Tomcod (*Microgadus tomcod*, juveniles and adults), and the Atlantic Herring (*Clupea harengus*, juveniles).

2.2.3 Amphibians and Reptiles

Five anuran species (toads and frogs) have been recorded in the NWA: the American Toad (*Anaxyrus americanus*), Spring Peeper (*Pseudacris crucifer*), Wood Frog (*Lithobates sylvaticus*), Green Frog (*Lithobates clamitans*), and Mink Frog (*Lithobates septentrionalis*)

(Latendresse *et al.*, in prep.; SHNVSL, 2001 and Mercier, 1986 in CWS, 2004). The first four species have also been observed in the Gros-Cacouna Marsh. The Wood Frog and Spring Peeper have been observed in the part of the Tourbière du Plateau de L'Isle-Verte located on federal lands adjacent to the NWA (Latendresse *et al.*, in prep.). Anurans appear to be relatively rare in the study area. The Northern Leopard Frog (*Lithobates pipiens*) and American Bullfrog (*Lithobates catesbeianus*) have previously been documented in the L'Isle-Verte sector (Ducks Unlimited, 2001 in CWS, 2004), but were not observed in the 2005 surveys (Latendresse *et al.*, in prep.).

The Redbelly Snake (*Storeria occipitomaculata*) and Eastern Gartersnake (*Thamnophis sirtalis*) have previously been recorded in the NWA (SHNVSL, 2001 in CWS, 2004). In the 2005 surveys, a Two-lined Salamander (*Eurycea bislineata*) was found under a damp tree stump in the forested part of the Tourbière du Plateau de L'Isle-Verte (outside the NWA) (Latendresse *et al.*, in prep.).

2.2.4 Birds

In 1981, close to 130 bird species were recorded in the NWA (de Repentigny, 1981 in Mercier *et al.*, 1986), more than 60 of which are potentially breeding species. More recently, bird surveys conducted in June 2005 by the CWS and MRNF in the NWA and on adjacent federal lands (particularly the Gros-Cacouna Marsh and the Tourbière du Plateau de L'Isle-Verte) (Latendresse *et al.*, in prep.), allowed to record 119 species (102 species in the L'Isle-Verte sector, including the adjacent federal lands, and 83 in the Gros-Cacouna sector). Given that the surveys were conducted in June, a number of the species recorded were potentially breeding species.

In 2005, the species observed at the largest number of survey points in the L'Isle-Verte and Gros-Cacouna sectors were, in descending order: the Red-winged Blackbird (*Agelaius phoeniceus*), Song Sparrow (*Melospiza melodia*), Common Yellowthroat (*Geothlypis trichas*), American Crow (*Corvus brachyrhynchos*), Wilson's Snipe (*Gallinago delicata*), Savannah Sparrow (*Passerculus sandwichensis*), and Alder Flycatcher (*Empidonax alnorum*). The Nelson's Sparrow (*Ammodramus nelsoni*) and Bobolink (*Dolichonyx oryzivorus*), two species with a precarious status, were observed at several locations in both sectors. Eighteen warbler species were also observed in the two sectors.

With respect to waterfowl, several species were observed in the L'Isle-Verte and Gros-Cacouna sectors, including the Snow Goose, Canada Goose, Wood Duck (*Aix sponsa*), Gadwall

(*Anas strepera*), American Widgeon (*Anas americana*), American Black Duck, Ring-necked Duck (*Aythya collaris*), Common Eider (*Somateria mollissima*), Common Goldeneye (*Bucephala clangula*), and Common Merganser (*Mergus merganser*) (Latendresse *et al.*, in prep.).

Of the waterbirds, the Great Blue Heron (*Ardea herodias*) and Black-crowned Night-Heron (*Nycticorax nycticorax*) are present in both sectors. Gros-Cacouna Mountain supports a Black Guillemot (*Cepphus grylle*) colony that numbered 20 to 30 individuals in 2005. The Yellow Rail (*Coturnicops noveboracensis*), a species at risk, was observed in the Gros-Cacouna Marsh and in the NWA (see 2.3 Species at Risk) (Latendresse *et al.*, in prep.).

A number of diurnal birds of prey were observed in the NWA, including the Sharp-shinned Hawk (*Accipiter striatus*), Broad-winged Hawk (*Buteo platypterus*), Northern Harrier (*Circus cyaneus*), Merlin (*Falco columbarius*), and Peregrine Falcon (*Falco peregrinus*), a species at risk. The three latter species were also recorded in the Gros-Cacouna sector. The Turkey Vulture (*Cathartes aura*) was also observed in the NWA (Latendresse *et al.*, in prep.).

Ten shorebird species were recorded in the L'Isle-Verte and Gros-Cacouna sectors in June 2005 (Latendresse *et al.*, in prep.). The Wilson's Snipe was by far the most common species and was observed in both sectors. The Killdeer (*Charadrius vociferus*) and Spotted Sandpiper (*Actitis macularius*) were also observed at both sites.

Migration

Spring

In the 1980s, an estimated 35 000 migratory birds stopped over at L'Isle-Verte in the spring. Some 27 000 birds of the subfamily Anserinae—among which 40% of Snow Geese, 34% of Canada Geese as well as Brants (*Branta bernicla*)—used the area as a stopover site during their migration to the summer breeding grounds (Mercier *et al.*, 1986). The three species still frequent the area in the spring, but the number of birds vary from year to year. Between 2000 and 2010, the annual maximum numbers of individuals within these species recorded by birdwatchers at L'Isle-Verte (Larivée, 2011: ÉPOQ's database) are as follows: 800 to 7000 Snow Geese, 12 to 160 Canada Geese and 1 to 3300 Brants.

Various other waterfowl species stop over in the NWA during their spring migration, including the Northern Pintail (*Anas acuta*), American Black Duck, Gadwall, Mallard (*A. platyrhynchos*), Northern Shoveler (*A. clypeata*), American Widgeon, Blue-winged Teal (*A. discors*), and Green-winged Teal (*A. crecca*) (CWS, 2004).

Fall

Although fewer migrating birds stop over at L'Isle-Verte in the fall than in the spring, several thousand birds use the area for foraging and resting. The family Anatidae is the largest group present (CWS, 2004).

In late summer and fall, numerous shorebird species frequent the L'Isle-Verte area, including the Semipalmated Sandpiper (*Calidris pusilla*), Lesser Yellowlegs (*Tringa flavipes*), Semipalmated Plover (*Charadrius semipalmatus*), and Ruddy Turnstone (*Arenaria interpres*). The Wilson's Snipe, Spotted Sandpiper, and Solitary Sandpiper (*Tringa solitaria*) are also observed *(*CWS, 2004; Larivée, 2011).

Eighteen shorebird species were observed during surveys conducted in the NWA in the fall of 2008 (Latendresse *et al.*, in prep.). The most abundant species were the Dunlin (*Calidris alpina*), Semipalmated Sandpiper, and Least Sandpiper (*Calidris minutilla*), accounting for 80% of the estimated number of birds. The Black-bellied Plover (*Pluvialis squatarola*), Semipalmated Plover, and Sanderling (*Calidris alba*) were also abundant. Among the other species observed in the NWA during the surveys, the Red Knot, *rufa* subspecies (*Calidris canutus rufa*), which is endangered, is of note. It also occurs in the Gros-Cacouna sector (Y. Aubry, pers. comm., 2013) (see 2.3 Species at Risk).

American Black Duck

The L'Isle-Verte region is one of the most important American Black Duck breeding sites in Quebec, which is one of the reasons Baie de L'Isle-Verte NWA was created (Gauthier *et al.*, 1980). Concerns had been raised in recent decades about the decline in American Black Duck numbers in North America, but the population appears to have stabilized over the last 10 years, at least in its breeding habitats (Canadian Wildlife Service Waterfowl Committee, 2012). However, it remains below the target set by the North American Waterfowl Management Plan (2012), a joint initiative between Canada, the United States and Mexico.

In the period prior to egg laying, female American Black Ducks have increased food requirements. The intertidal pools and the many invertebrates inhabiting them, primarily in the Saltmeadow Cordgrass zone, are the most suitable food sources (Gauthier *et al.*, 1980). However, nesting takes place in the part of the marsh that is not exposed to tides and in surrounding coastal habitats, such as croplands, abandoned fields, islands, sphagnum peat bogs, conifer stands and shrublands (Gauthier *et al.*, 1980, Reed, 1970 and 1975, and Cantin 1974 in Bélanger *et al.*, 1994; Bélanger *et al.*, 1998).

A study was conducted in the L'Isle-Verte region to survey the various nesting habitats of this species, namely farmlands, the coastal marsh and forested areas, including peat bogs (Bélanger *et al.*, 1994). Only 15% of the American Black Duck nests found were located in the NWA, and 80% were in the Tourbière du Plateau de L'Isle-Verte (Figure 1), where the highest nest density (22.5 nests/100 ha) and highest nest success (47%) were observed. Tall herbaceous meadows and farmlands had lower nest densities (2.2 nests/100 ha and 0.4 nests/100 ha, respectively). Close to 75% of the nests found in the peat bog were located directly under a tree (primarily Black Spruce or Tamarack). The vast majority of nests found in the coastal marsh were located in herbaceous vegetation (Bélanger *et al.*, 1994).

During the rearing period, the cordgrass marsh provides ducklings with the cover and food resources required for their growth and survival. Studies have shown that ducklings rely on Saltmeadow Cordgrass and Prairie Cordgrass (salt grass) zones for 85% of their diet and that the Smooth Cordgrass zone plays a secondary role (Lehoux, 1972 in Gauthier *et al.*, 1980). Moreover, the many intertidal pools that divide the marsh into many small units appear to constitute the home range (territory) or rearing habitat of each of the broods (Reed, 1973 in Gauthier *et al.*, 1980). It is estimated that there are 8.3 broods per kilometre of shoreline and that 4.5 ducklings per brood survive to fledging. This means that the NWA's 15 kilometres of shoreline would provide enough resources for 560 ducklings to fledge (Mercier *et al.*, 1986).

2.2.5 Mammals

Several species of mammals occur in the NWA and in adjacent areas, including the Gros-Cacouna Marsh.

In surveys conducted by the CWS and MRNF in 2005, nine species of micromammals were recorded in the L'Isle-Verte sector (including the NWA and adjacent federal lands) and six species were recorded in the Gros-Cacouna sector (Latendresse *et al.*, in prep.). Three species of shrew occur in the two sectors and in the NWA: the Short-tailed Shrew (*Blarina brevicauda*) and Masked Shrew (*Sorex cinereus*), which were particularly abundant and widespread, and the Smokey Shrew (*Sorex fumeus*), which was much rarer. The Southern Red-backed Vole (*Myodes gapperi*) and Meadow Vole (*Microtus pennsylvanicus*) were relatively abundant in the two sectors and were observed in the NWA. The Deer Mouse (*Peromyscus maniculatus*) was observed only in the L'Isle-Verte sector (Tourbière du Plateau de L'Isle-Verte, outside the NWA). A single House Mouse (*Mus musculus*) was recorded in the L'Isle-Verte sector (in the NWA). The Meadow Jumping Mouse (*Zapus hudsonius*) was present in both sectors, and a single

Woodland Jumping Mouse (*Napaeozapus insignis*) was recorded in the wooded area of the L'Isle-Verte sector (south of the Tourbière du Plateau de L'Isle-Verte, outside the NWA).

At least two bat species were recorded in acoustic surveys conducted in July 2005 in the L'Isle-Verte and Gros-Cacouna sectors (Latendresse *et al.*, in prep.). The Hoary Bat (*Lasiurus cinereus*) is the only bat species identified with certainty in the two study areas, including the NWA and Tourbière du Plateau de L'Isle-Verte (see 2.3 Species at Risk). The majority of the recordings were however associated with species of the *Myotis* genus that were detected in the two study areas, including the NWA. The calls could be those of the Little Brown Bat (*Myotis lucifugus)* or the Northern Myotis (*Myotis septentrionalis*), but their identification could not be confirmed (see 2.3 Species at Risk).

The NWA and its surrounding area also support a number of other terrestrial mammals, including the Snowshoe Hare (*Lepus americanus*), American Porcupine (*Erethizon dorsatum*), American Red Squirrel (*Tamiasciurus hudsonicus*), Eastern Chipmunk (*Tamias striatus*), Red Fox (*Vulpes vulpes*), Coyote (*Canis latrans*), Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Mink (*Neovison vison*), Long-tailed Weasel (*Mustela frenata*), and Ermine (*Mustela erminea*). The Muskrat (*Ondatra zibethicus*) is abundant in the channels, ditches and ponds created or enhanced by Ducks Unlimited, where it feeds on plants. The Woodchuck (*Marmota monax*) occurs in fields and wastelands. A Fisher (*Martes pennanti*) was observed for the first time in the NWA in the summer of 2002 (CWS, 2004). In addition, a Northern River Otter (*Lontra canadensis*) was observed in the pond along the Sentier des Roitelets in 2011 (J. Bachand, 2012, pers. comm.). For several years, the American Beaver (*Castor canadensis*) have also been found in this sector, where it can sometimes have undesirable effects, such as cutting down trees, flooding small areas of land, and degrading the dikes (e.g., by burrowing dens, obstructing water control structures).

Among the large terrestrial mammals, the Moose (*Alces americanus*) and the White-tailed Deer (*Odocoileus virginianus*) visit the wooded areas of the NWA and adjacent areas during the summer months. Lastly, marine mammals, such as the Harbour Seal (*Phoca vitulina vitulina*) and Grey Seal (*Halichoerus grypus*), rest and bask in the sun on the rocks of the intertidal zone bordering the NWA.

2.3 SPECIES AT RISK

Baie de L'Isle-Verte NWA supports at least six species listed as being at risk under the federal *Species at Risk Act* (SARA) and nine species that are considered threatened or

vulnerable, or are likely to be designated as such, under the Quebec *Act Respecting Threatened or Vulnerable Species* (ARTVS) (Table 7).

The Least Bittern (*Ixobrychus exilis*) is a marsh bird whose numbers in Quebec are low. The last observation of this species in the NWA dates back to 1999 (SOS-POP, 2013). It was not observed during visits and surveys conducted between 2000 and 2006 (SOS-POP, 2013; Latendresse *et al.*, in prep.). The Yellow Rail, another marsh bird, was heard in the NWA in July 2005 (Latendresse *et al.*, in prep.). The L'Isle-Verte Marsh is a potential nesting site for this species (Robert and Laporte, 1996).

The Peregrine Falcon was observed a few times in the NWA and on adjacent lands (east of the aménagement Roitelet) during surveys carried out in June 2005 (Latendresse *et al.*, in prep.) and by birdwatchers (Larivée, 2011). The Short-eared Owl (*Asio flammeus*) was observed a few times in the NWA in June and July 2012. Those were the first mentions of this species in the region since 2002 (SOS-POP, 2013). Between 1991 and 2002, it was observed near the NWA, west of Rivière des Vases (Cacouna Est), but it is now very rarely seen in the region.

The Bank Swallow (*Riparia riparia*) and Barn Swallow (*Hirundo rustica*) were observed in the NWA during surveys carried out in June 2005 (Latendresse *et al.*, in prep.).Many observations of both species are also reported by birdwatchers in the NWA ans adjacent lands (Larivée, 2011). The Bank Swallow nests on the Rivière Verte banks (at the edge of the NWA) where two colonies of the species have been surveyed (Nature Québec, 2014). The Barn Swallow also nests occasionally on the river banks and nearby (M. Labrecque, Nature Québec, pers. comm., 2016).

The Nelson's Sparrow is known to have nested in the region for several years. Large numbers of this species were recorded in the L'Isle-Verte sector, including the NWA, in the June 2005 surveys (Latendresse *et al.*, in prep.). The surveys demonstrated the importance of the study area, including the L'Isle-Verte sector, for this species, which is considered a rare or uncommon migratory breeder in Quebec (David, 1995 and Ouellet, 1995 in Rivard *et al.*, 2006). The Bobolink is often observed in the L'Isle-Verte region (Larivée, 2011; Latendresse *et al.*, in prep.), where it breeds, as well as in the NWA, where nesting of the species is probable but unconfirmed. This species has experienced severe declines since the late 1960s (COSEWIC, 2014).

About 10 Red Knots of the *rufa* subspecies were observed in the NWA, at the L'Isle-Verte dock, during shorebird surveys conducted in September 2008 (Latendresse *et al.*, in prep.). This species uses the St. Lawrence Upper Estuary and Lower Estuary essentially during its fall migration (Aubry and Cotter, 2007). It may use the NWA as a migratory stopover point.

The Golden Eagle (*Aquila chrysaetos*) and the Bald Eagle (*Haliaeetus leucocephalus*) are transients in the NWA.

Lastly, the Hoary Bat was recorded in the L'Isle-Verte sector, including the NWA, in acoustic surveys made in 2005. Bats of the genus *Myotis* have also been recorded in the sector, including the NWA. The sonograms could be those of the Little Brown Bat or the Northern Myotis, but their identification could not be confirmed due to the strong similarities between the sounds of both species. Based on their ecological preferences, it was most probably the Little Brown Bat (Latendresse *et al.,* in prep.).

Table 7: Species at risk in Baie de L'Isle-Verte National Wildlife Area

Common and scientific names of species	Status in Canada SARA[1]	Status in Canada COSEWIC[2]	Status in Quebec ARTVS[3]	Comments
Birds				
Golden Eagle *Aquila chrysaetos*	No status	Not at risk	Vulnerable	Transient in the NWA.
Red Knot *Calidris canutus rufa*	Endangered	Endangered	SLDTV[4]	May use the NWA as a migratory stopover point in the fall.
Nelson's Sparrow *Ammodramus nelsoni*	No status	Not at risk	SLDTV[4]	Has nested in the L'Isle-Verte region for several years.
Peregrine Falcon *Falco peregrinus (anatum/tundrius)*	Special concern*	Special concern*	Vulnerable** or SLDTV[4]***	Frequents the NWA and adjacent lands.
Bobolink *Dolichonyx oryzivorus*	No status	Threatened	No status	Often observed in the L'Isle-Verte region, where it breeds, and in the NWA, where nesting is probable but unconfirmed.
Short-eared Owl *Asio flammeus*	Special concern	Special concern	SLDTV[4]	Observed in the NWA in the summer of 2012: first mentions of the species in the region since 2002.
Bank Swallow *Riparia riparia*	No status	Threatened	No status	Frequents the NWA. There are two colonies near the NWA.
Barn Swallow *Hirundo rustica*	No status	Threatened	No status	Frequents the NWA and nests near the NWA

Table 7: Species at risk in Baie de L'Isle-Verte National Wildlife Area (continued)

Common and scientific names of species	Status in Canada SARA[1]	Status in Canada COSEWIC[2]	Status in Quebec ARTVS[3]	Comments
Birds (continued)				
Least Bittern *Ixobrychus exilis*	Threatened	Threatened	Vulnerable	Last observations in the NWA dates back to 1999.
Bald Eagle *Haliaeetus leucocephalus*	No status	Not at risk	Vulnerable	Transient in the NWA.
Yellow Rail *Coturnicops noveboracensis*	Special concern	Special concern	Threatened	Heard in the NWA in July 2005. The L'Isle-Verte Marsh is a potential nesting site for the species.
Mammals				
Hoary Bat *Lasiurus cinereus*	No status	No status	SLDTV[4]	Recorded during acoustic surveys in the NWA in 2005.
Myotis sp. (Little Brown Bat, *M. lucifugus,* **and/or** Northern Myotis, *M. septentrionalis*)	Endangered	Endangered	No status	Recorded in the NWA in 2005. Identification unconfirmed, but probably the Little Brown Bat (*M. lucifugus*).

1 Federal *Species at Risk Act* (Species at Risk Public Registry, 2017)
2 Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2017)
3 Quebec *Act Respecting Threatened or Vulnerable Species* (MFFP, 2017)
4 Species likely to be designated threatened or vulnerable in Quebec (MFFP, 2017)
* Status assigned to the two subspecies *anatum/tundrius* taken together
** Status assigned to the *anatum* subspecies
*** The *tundrius* subspecies

FEDERAL LANDS ADJACENT TO THE NWA

GROS-CACOUNA MARSH

The Gros-Cacouna Marsh supports at least six species that are listed as species at risk under SARA and nine species that are considered threatened or vulnerable, or are likely to be designated as such, under ARTVS (Table 8).

The Least Bittern was observed in the Gros-Cacouna sector in 2012 (SOS-POP, 2013). The first recorded observation of this small heron in the sector dates to 1987. The species was not observed during the visits or surveys conducted between 2000 and 2006 (SOS-POP, 2013; Latendresse *et al.*, in prep.). The Yellow Rail was observed several times during the breeding period in the Gros-Cacouna Marsh (Robert and Laporte, 1996, 1999; Latendresse *et al.*, in prep.), which is considered a particularly important site for this species along the St. Lawrence (Robert and Laporte, 1996, 1999; Robert *et al.*, 2000).

The Peregrine Falcon was observed a few times in the Gros-Cacouna sector during surveys carried out in June 2005 (Latendresse *et al.*, in prep.). Several observations of the species are also reported by birdwatchers in this area (Larivée, 2011). Breeding of the species on Gros-Cacouna Mountain (not on Environment and Climate Change Canada lands) was confirmed in 2006, 2008, 2009 and 2010 (SOS-POP, 2013). The Short-eared Owl once bred in the Gros-Cacouna sector (last known record dates from 1997), but it is now rarely observed in the region (SOS-POP, 2013).

The Bank Swallow was observed in the wet meadows of the Gros-Cacouna sector during the June 2005 surveys (Latendresse *et al.*, in prep.). The surveys also recorded the Nelson's Sparrow in this sector as well as the Bobolink, which is often observed in the Gros-Cacouna region (Larivée, 2011). These two species breed in the sector.

During its migrations, the Red Knot (*rufa* subspecies) uses the intertidal zones located north of Gros-Cacouna Mountain, on lands owned by Environment and Climate Change Canada, and the intertidal zones situated east of the mountain, for which the department holds the shore rights. Over 100 Red Knots are often observed in the latter area (Y. Aubry, pers. comm., 2013).

The Golden Eagle and Bald Eagle are transients in the Gros-Cacouna sector.

Lastly, the Hoary Bat was identified in the Gros-Cacouna sector in 2005. Bats of the genus *Myotis* have also been recorded in the sector. The calls could be those of the Little Brown Bat or the Northern Myotis, but their identification could not be confirmed due to the strong similarities between the sounds of both species. Based on their ecological preferences, it was most probably the Little Brown Bat (Latendresse *et al.,* in prep.).

TOURBIÈRE DU PLATEAU DE L'ISLE-VERTE

The Tourbière du Plateau de L'Isle-Verte supports at least three species that are considered at risk under SARA and three species that are likely to be designated threatened or vulnerable under ARTVS (Table 8).

The Canada Warbler (*Cardellina canadensis*) was observed in a mixed forest of the peat bog in the June 2005 surveys (Latendresse *et al.,* in prep.). It is a probable breeder at this site. The Common Nighthawk (*Chordeiles minor*) was heard several times in the peat bog, and it is possible that this species breeds in the sector. The Hoary Bat was also identified in the peat

bog. In addition, bats of the genus *Myotis* have been recorded in the sector. The calls could be those of the Little Brown Bat or the Northern Myotis, but their identification could not be confirmed due to the strong similarities between the sounds of both species. Based on their ecological preferences, it was most probably the Little Brown Bat (Latendresse *et al.,* in prep.).

Table 8: Species at risk in the Gros-Cacouna Marsh and Tourbière du Plateau de L'Isle-Verte

Common and scientific names of species	Status in Canada SARA[1]	Status in Canada COSEWIC[2]	Status in Quebec ARTVS[3]	Comments
GROS-CACOUNA MARSH				
Birds				
Golden Eagle *Aquila chrysaetos*	No status	Not at risk	Vulnerable	Transient
Red Knot *Calidris canutus rufa*	Endangered	Endangered	SLDTV[4]	Uses the intertidal zones of the marsh during the fall migrations.
Nelson's Sparrow *Ammodramus nelsoni*	No status	Not at risk	SLDTV[4]	Observed during the June 2005 survey. Breeds in the sector.
Peregrine Falcon *Falco peregrinus anatum/tundrius*	Special concern*	Special concern*	Vulnerable** or SLDTV[4]***	Breeds on Gros-Cacouna Mountain.
Bobolink *Dolichonyx oryzivorus*	No status	Threatened	No status	Observed during the June 2005 survey. Breeds in the sector.
Short-eared Owl *Asio flammeus*	Special concern	Special concern	SLDTV[4]	Once bred in the area, but rarely observed in the area.
Bank Swallow *Riparia riparia*	No status	Threatened	No status	Observed during the June 2005 survey.
Least Bittern *Ixobrychus exilis*	Threatened	Threatened	Vulnerable	First recorded observations in the sector in 1987; last recorded in 2012.
Bald Eagle *Haliaeetus leucocephalus*	No status	Not at risk	Vulnerable	Transient in the Gros-Cacouna sector.
Yellow Rail *Coturnicops noveboracensis*	Special concern	Special concern	Threatened	Several observations during the breeding season. The marsh is important for the species along the St. Lawrence.
Mammals				
Hoary Bat *Lasiurus cinereus*	No status	No status	SLDTV4	Recorded (acoustic surveys) in 2005.

Table 8: Species at risk in the Gros-Cacouna Marsh and Tourbière du Plateau de L'Isle-Verte (continued)

Common and scientific names of species	Status in Canada SARA[1]	Status in Canada COSEWIC[2]	Status in Quebec ARTVS[3]	Comments
GROS-CACOUNA MARSH				
Mammals (continued)				
*Myotis sp. (*Little Brown Bat*, M. lucifugus, **and/or** *Northern Myotis*, M. septentrionalis)*	Endangered	Endangered	No status	Recorded in the marsh in 2005. Identification unconfirmed but probably the Little Brown Bat.
TOURBIÈRE DU PLATEAU DE L'ISLE-VERTE				
Birds				
Common Nighthawk *Chordeiles minor*	Threatened	Threatened	SLDTV[4]	Heard several times in the bog during the June 2005 survey. Possible breeder in the bog.
Canada Warbler *Cardellina canadensis*	Threatened	Threatened	SLDTV[4]	Observed in the bog during June 2005 surveys. Probable breeder there.
Mammals				
Hoary Bat *Lasiurus cinereus*	No status	No status	SLDTV[4]	Recorded during acoustic surveys in 2005.
*Myotis sp. (Little Brown Bat, M. lucifugus, **and/or** Northern Myotis, M. septentrionalis)*	Endangered	Endangered	No status	Recorded in the bog in 2005. Identification unconfirmed but probably the Little Brown Bat.

1 Federal *Species at Risk Act* (Species at Risk Public Registry, 2017)
2 Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2017)
3 Quebec *Act Respecting Threatened or Vulnerable Species* (MFFP, 2017)
4 Species likely to be designated threatened or vulnerable in Quebec (MFFP, 2017)
* Status assigned to the two subspecies *anatum/tundrius* taken together
** Status assigned to the *anatum* subspecies
*** The *tundrius* subspecies

2.4 INVASIVE SPECIES

In the L'Isle-Verte region, six alien plant species were identified in studies conducted in 2000 and 2001 by the St. Lawrence Centre (Martin Jean, SLC, in CWS, 2004). The most common was the Purple Loosestrife (*Lythrum salicaria*). The Canada Thistle (*Cirsium arvense*) and the Tufted Vetch (*Vicia cracca*) were also recorded. Alien plant species were not widely distributed in the NWA, although several species covered large, albeit localized, areas.

In 2011, the European Reed (*Phragmites australis*), an exotic species, was recorded for the first time in the *aménagement* Salicorne (wildlife habitat enhancement), in the Roitelets Area, and in the Louis Bertrand Marsh zone, between Rivière du Petit Sault and Pointe à la Loupe, in the east part of the NWA (Bachand, 2011). The Purple Loosestrife colonizes virtually the same sites as the European Reed in this sector. In 2012, the CWS noted the presence of six European Reed colonies along the St. Lawrence west of Rivière des Vases.

FEDERAL LANDS ADJACENT TO THE NWA

GROS-CACOUNA MARSH

The Purple Loosestrife and European Reed also occur in the Gros-Cacouna Marsh. The Common Cattail, a native plant species, is in the process of invading the southeastern part of the marsh and there is a risk that it will result in the complete loss of Chaffy Sedge communities, which provide important habitat for the Yellow Rail. The Common Cattail has already invaded the Étang du Marais, which became eutrophic and now has few open water areas, making it relatively unattractive to birds (Environment Canada, 2007).

3 MANAGEMENT CHALLENGES AND THREATS

Baie de L'Isle-Verte NWA is exposed to a number of threats and present various management challenges, including the impact of human activities, fragmentation of the territory, development of surrounding lands, degradation of wildlife habitats and enhancement works, maintenance of facilities and infrastructure, scientific knowledge gaps, invasion by plant species and accidental spills. They are described below in approximate order of importance since the scope of several of them is not well known.

3.1 IMPACT OF HUMAN ACTIVITIES

3.1.1 Visitors

Visitors to the NWA sometimes go off the official trails and, as a result, can trample fragile habitats, in part because of poor marking of trails and conservation zones. Some visitors do not follow the rules and let their pets off leash or even ride their bicycles on certain trails in the NWA (Digue des Roitelets) and Gros-Cacouna Marsh (outside the NWA), which is a source of wildlife disturbance.

3.1.2 Motorized Traffic

Although motorized traffic is prohibited in the NWA, visitors sometimes use motor vehicles in the NWA in summer, such as all-terrain vehicles (CPBSL, 2013). These vehicles can degrade habitats and harm wildlife. In winter, snowmobilers ride in the NWA illegally and can damage vegetation and disturb wildlife.

3.1.3 Resource Harvesting

Hunting

A fall waterfowl hunt is authorized in designated parts of the NWA and Gros-Cacouna Marsh. If the hunt is not carried out properly, it can lead to the destruction of vegetation for the construction of blinds, trampling of fragile environments, incidental take of birds and accumulation of waste.

Poaching

Illegal harvesting of resources also affects the NWA's plant and animal life. Poaching can result in excessive harvesting. It is difficult to assess the impact of poaching on duck populations or other animal species (e.g., Moose and White-tailed Deer).

Picking Plants

The illegal picking of plants, particularly the Virginia Glasswort in the sector of the Rivière des Vases wharf, can disturb habitats (J. Bachand, CPBSL, pers. comm., 2012).

3.1.4 Agriculture

Agriculture is authorized in the NWA for the purpose of creating, enhancing and diversifying wildlife habitat. Despite the fact that agricultural activities are governed by permits aimed at mitigating the effects on the environment, they can still have undesirable effects, such as habitat loss and alteration (through mowing, land drainage and circulation of farm equipment), destruction of bird nests on the ground, the introduction of alien plant species, and contamination of soil and water by pesticides and fertilizers.

3.2 NWA FRAGMENTATION

The territory of the NWA is long and fragmented. It consists of a narrow strip 1- to 2-kilometres wide and roughly 20 kilometres long, interspersed with private lands and federal lands without protected status. The latter, including the Gros-Cacouna Marsh and the Tourbière du Plateau de L'Isle-Verte, are under various pressures from surrounding activities, as is the NWA. However, unlike the NWA, these lands are not subject to the regulations that apply to NWAs and protect wildlife species and their habitats. Lastly, the belt of human activities and infrastructure south of the NWA (e.g., inhabited areas, farmlands, Route 132) can adversely affect the free movement of certain wildlife species between the NWA and adjacent natural areas.

3.3 DEVELOPMENT OF SURROUNDING LANDS

The rehabilitation of Route 132 and its access roads and the extension of Highway 20 cause further fragmentation of the landscape, and there is a risk that they will result in wildlife habitat losses, accidental wildlife mortalities, and constraints on the movement of species with large home ranges (such as Moose). These roads exacerbate the enclosing of the NWA and adjacent areas and the isolation of wildlife that uses it. Highway 20 has been fenced off from Cacouna to L'Isle-Verte, but there are no corridors to aid in wildlife movement.

The new Kiskotuk coastal park, which was created to protect and enhance the coastal corridor of the municipalities of Cacouna and L'Isle-Verte (CPBSL, 2013), could also have impacts associated with increased recreation and tourism in the area. The NWA and Gros-Cacouna Marsh lie within the park boundaries although they belong to Environment and Climate Change Canada and are managed by this department. Park management has plans to offer

various activities, such as hiking and cycling (outside the NWA), and to provide accommodation, such as campsites and cottages. Although the park's and NWA's objectives are complementary and although the park will promote the protection of natural areas and public awareness of the importance of coastal environments, its presence could lead to increased use of the area, which would complicate monitoring and enforcement activities in the NWA and result in a need for greater public information and closer cooperation among managers of the areas. On the other hand, the local stakeholders of the Kiskotuk coastal park can promote increased monitoring and protection of the NWA.

Lastly, oil terminal and development projects in the field of maritime transport that have been proposed at the Gros-Cacouna port, near the marsh, could have environmental impacts.

3.4 DEGRADATION OF WILDLIFE HABITAT AND WILDLIFE HABITAT ENHANCEMENTS

3.4.1 Land Drainage

For over three centuries, various human uses of the area have resulted in the degradation of local habitats and lands that are now part of the NWA. Aboiteaux (dikes) were constructed and channels were dug to drain the cordgrass marshes for agriculture. This resulted in blocking or restricting water and nutrient inputs from groundwater and the St. Lawrence River, which influenced the composition of plant and animal communities (CWS, 2004).

Drainage channels dug on farmlands and roadsides have an impact on certain habitats in the intertidal marsh, particularly the Saltmeadow Cordgrass and Prairie Cordgrass zones. Drainage causes the tidal pools to dry up and become hypersaline, leading to their colonization by the Virginia Glasswort and the Canada Sand-spurrey. These two species replace Sea Ditchgrass communities, which are the preferred habitats of a variety of animal species, including the American Black Duck (Environment Canada, 2007).

3.4.2 Natural Phenomena

In recent years, a number of intense natural phenomena have resulted in habitat degradation in the NWA. Large fall tides accompanied by northeasterly winds have caused shoreline and dike erosion and flooding of large areas of land. Extreme storm episodes have damaged trees, and heavy spring floods have carried debris into habitats (J. Bachand, CPBSL, pers. comm., 2012).

Studies on coastal erosion show very high rates of shoreline retreat in the unconsolidated (loose) deposits of the St. Lawrence Gulf and Estuary (Bernatchez and Dubois, 2004). On the south shore of the St. Lawrence, erosion rates of 0.25 to 0.50 metre per year were calculated for the upper schorre (in geology, the upper part of the marsh that is flooded during spring tides). L'Isle-Verte and Cacouna are among the coastal zones of the St. Lawrence that are known to be particularly vulnerable to erosion. Climate change is expected to accelerate coastal erosion owing in part to global sea level rise and increased storm intensity (Bernatchez and Dubois, 2004). In order to follow the coastal dynamics and erosion processes, the Laboratoire de dynamique et de gestion intégrée des zones côtières of Université du Québec à Rimouski (UQAR) has recently installed monitoring stations in the Cacouna and L'Isle-Verte marshes.

3.4.3 Wildlife Habitat Enhancements

The wildlife habitat enhancements (*aménagements*) created by Ducks Unlimited and Environment Canada for migratory birds in the 1980s (e.g. dikes and ponds) are showing signs of degradation. These aging structures can sometimes be damaged by Muskrats and Beavers, which dig tunnels into them, and by wave-induced erosion. As a result, the structures can no longer retain water, leading to the drying-out and degradation of habitats that once supported waterfowl.

3.5 MAINTENANCE OF FACILITIES AND INFRASTRUCTURE

Visitor facilities and infrastructure in the NWA and Gros-Cacouna Marsh, including trails, lookouts and the interpretation centre at the Maison Girard, are subject to normal wear and tear. Other structures, as the boardwalks and information and interpretive kiosks, are in need of more urgent repairs. Such facilities must be maintained in order to ensure the safety of visitors and to discourage them from going off trail and disturbing the environment.

Beavers are having a number of impacts in the Roitelets Area, such as obstructing waterflow structures (culvert pipes) and cutting down trees. The felled trees block trails and bridges. Specific measures are sometimes needed.

3.6 SCIENTIFIC KNOWLEDGE GAPS

Although the Canadian Wildlife Service and various collaborators have been conducting several surveys and studies on the natural resources of the NWA since the 1970s, information on some resources is lacking or out of date, particularly with respect to the use of the NWA by species at risk, the presence of invasive plant species, the characterization of habitats and the

threats facing the NWA. If additional information were available, the ecological health status of the NWA could be better measured and management decision-making would be better supported.

3.7 INVASION BY PLANT SPECIES

Invasive plant species have a limited distribution in the NWA. Until recently, they did not constitute a threat to the ecological health status of the NWA (CWS, 2004). However, the recent appearance and spread of invasive alien plant species, such as the European Reed, could pose a serious threat to the ecosystems of the NWA because this plant disturbs the composition of wildlife habitats.

European Reed and Purple Loosestrife colonies have also been observed in the Gros-Cacouna Marsh. Moreover, the Broad-leaved Cattail is invading a part of the marsh, which provides important habitat for various species, including the Yellow Rail.

3.8 ACCIDENTAL SPILLS

The NWA is exposed to a risk of accidental spills of hydrocarbons and other toxic products associated with the heavy boat traffic in the St. Lawrence. Such spills could have a serious impact on the habitats and species of the NWA. Environment and Climate Change Canada and its collaborators have developed an emergency response plan (ERP) that calls for appropriate protection measures for birds in the event of a spill.

4 GOALS AND OBJECTIVES

4.1 VISION

Baie de L'Isle-Verte National Wildlife Area protects a cordgrass marsh and other important habitats for species at risk, priority bird species, particularly waterfowl, and other wildlife species. Priority bird species are those identified in the *Bird Conservation Strategy for Bird Conservation Region 14 in Quebec Region: Atlantic Northern Forest* (Environment Canada, 2013a).

4.2 GOALS AND OBJECTIVES

The following goals and objectives are intended to define the vision of the management plan, taking into account the threats and management challenges. The goals and objectives will be achieved through the actions set out in table 9 (Management Approaches for Baie de L'Isle-Verte National Wildlife Area), which will be implemented on the basis of available resources.

Goal 1: Protect and enhance significant habitats for species at risk, priority bird species, and other wildlife species.

Objectives

1.1 Protect the priority bird populations of the NWA, including breeding populations of waterfowl such as the American Black Duck.

1.2 Maintain populations of species with a precarious status and their habitats by implementing the recommendations and actions outlined in federal and provincial recovery documents.

1.3 Identify and protect the fragile and most representative habitats of the NWA, or the most important in terms of conservation.

1.4 Inspect and repair wildlife habitat enhancements to restore degraded habitats and improve the ecological health status of the NWA.

1.5 Limit the spread of certain invasive species.

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

Objectives

2.1 Complete NWA signage and boundary marking to protect plant and animal species from the impact of human activities.

2.2 Inform regional communities and the public of the NWA's mission and applicable regulations.

2.3 Ensure regular annual monitoring of the area to reduce the number of incidents related to regulatory non-compliance.

2.4 Encourage agricultural practices that have the least possible adverse effects on habitats of the NWA and adjacent lands.

Goal 3: Consolidate the NWA's land holdings and promote the conservation of natural habitats on adjacent lands in order to foster connectivity and better ecological conditions.

Objectives

3.1 Identify federal lands or other lands adjacent to the NWA that should be protected.

3.2 Integrate into the NWA federal lands or other lands adjacent to the NWA that have ecological value.

3.3 Limit the possible impact of human activities on lands adjacent to the NWA.

3.4 Protect natural habitats on federal lands adjacent to the NWA that have ecological value.

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

Objectives

4.1 Develop and implement an ecological monitoring plan.

4.2 Fill priority gaps in scientific knowledge.

Goal 5: Raise awareness among the public and regional community about the conservation of the NWA, wildlife species and their habitats.

Objectives

5.1 Encourage public and regional community outreach and communication activities on the importance of conservation and the role of the NWA.

5.2 Ensure that the facilities and infrastructure are in good condition and safe for visitors.

5.3 Promote local community awareness and involvement in the conservation of the NWA and adjacent lands.

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 priorities for action and resource investment. The management plan itself will be re-evaluated five years after its initial approval, and reviewed and updated every decade thereafter.

Table 9: Management Approaches for Baie de L'Isle-Verte Wildlife Management Area

Goals	Objectives	Actions (Priority Level[1])
Goal 1: Protect and enhance significant habitats for species at risk, priority bird species, and other wildlife species. **Threats and challenges:** • Accidental spills • Degradation of wildlife habitats and wildlife habitat enhancements • Maintenance of facilities and infrastructure • Invasion by plant species	**Objective 1.1:** Protect the priority bird populations of the NWA, including breeding populations of waterfowl such as the American Black Duck.	• Conduct surveys of priority bird populations in the NWA, including breeding waterfowl populations, particularly the American Black Duck, and identify the factors affecting their numbers. **(1)** • Establish protection measures for the priority bird species of the NWA. **(1)** • Take targeted actions (e.g., nest boxes, wildlife habitat enhancements), as needed, to increase the American Black Duck population. **(2)** • Conduct a follow-up of the birds harvested in the hunt, as needed, to assess the effect of the hunt on populations of priority bird species. **(2)**
	Objective 1.2: Maintain populations of species with a precarious status and their habitats by implementing the recommendations and actions outlined in federal and provincial recovery documents.	• Identify the habitat protection and enhancement needs to protect species at risk, such as the Yellow Rail, Least Bittern, Bobolink, and Short-eared Owl. **(1)** • In response to the recommendations made in recovery documents, publish in the *Canada Gazette* descriptions of the critical habitat of species at risk that occur in the NWA. **(2)** • Following the gazetting of the critical habitat, develop and implement critical habitat protection measures. **(3)** • Ensure long-term protection of plant and animal species with a precarious status in collaboration with provincial authorities, as needed. **(2)**
	Objective 1.3: Identify and protect the fragile and most representative habitats of the NWA, or the most important in terms of conservation.	• Establish the conservation priorities of the NWA, taking into account fragile habitats and habitats of interest from a biodiversity perspective. **(1)** • Map the fragile elements and habitats to facilitate their protection in the event of an accidental spill of toxic products on land or water. **(1)** • Implement the habitat conservation and restoration priorities, including maintenance and restoration of the cordgrass marsh. **(2)**
	Objective 1.4: Inspect and repair wildlife habitat enhancements to restore degraded habitats and improve the ecological health status of the NWA.	• Inspect wildlife habitat enhancements. **(1)** • Set priorities for the restoration and maintenance of wildlife habitat enhancements and develop an action plan. **(1)** • Work with collaborators on the restoration of wildlife habitat enhancements to optimize their use by wildlife. **(2)** • Establish a program to monitor the use of wildlife habitat enhancements. **(3)**

Table 9: Management Approaches for Baie de L'Isle-Verte Wildlife Management Area (continued)

Goals	Objectives	Actions (Priority Level[1])
	Objective 1.5: Limit the spread of certain invasive species.	• Conduct an inventory and mapping of invasive species. **(1)** • Implement a program to monitor invasive species. **(1)** • Carry out actions targeted at invasive species, such as the European Reed (exotic). **(2)** • Assess the need to take action at the Gros-Cacouna Marsh to limit invasion of potential Yellow Rail habitat by cattails. **(2)**
Goal 2: Reduce the impact of human activities on the NWA. **Threats and challenges :** • Impact of human activities • NWA fragmentation • Development of surrounding lands	**Objective 2.1:** Complete NWA signage and boundary marking to protect plant and animal species from the impact of human activities.	• As required, review the cadastral boundaries of the NWA. **(1)** • Install comprehensive signage and complete NWA boundary marking. **(1)**
	Objective 2.2: Inform regional communities and the public of the NWA's mission and applicable regulations.	• Post notices displaying the regulations of the NWA. **(1)** • Publish public notices of the regulations in newspapers. **(1)** • Promote the development of NWA information and outreach tools (e.g., brochure, visitor's guide, discovery guide). **(3)**
	Objective 2.3: Ensure regular annual monitoring of the area to reduce the number of incidents related to regulatory non-compliance.	• Identify priorities with respect to the enforcement of the various regulations in effect to protect birds and other wildlife species. **(1)** • Identify needs in terms of the monitoring of the area and the enforcement of regulations governing off-road vehicle traffic, off-leash pets, harvesting of plant and animal resources, and vandalism, and ensure compliance. **(1)**
	Objective 2.4: Encourage agricultural practices that have the least possible adverse effects on the habitats of the NWA and adjacent lands.	• Ensure that the requirements of permits governing agricultural activities in the NWA and on adjacent federal lands are met. **(1)** • Encourage agricultural practices that promote the preservation of the following species with a precarious status: the Nelson's Sparrow, Bobolink, and Short-eared Owl. **(1)** • Develop a plan for the use of agricultural lands and the production of attractive crops for wildlife in the NWA and on adjacent federal lands. **(2)** • Conduct a follow-up with farmers and the Quebec Department of Transport of the methods used to drain farmlands and Route 132. **(3)** • Assess and establish measures to mitigate the effects of land drainage and fertilizer and pesticide use on lands farmed under permits. **(3)**

Table 9: Management Approaches for Baie de L'Isle-Verte Wildlife Management Area (continued)

Goals	Objectives	Actions (Priority Level[1])
Goal 3: Consolidate the NWA's land holdings and promote the conservation of natural habitats on adjacent lands in order to foster connectivity and better ecological conditions. **Threats and challenges :** • NWA fragmentation • Development of surrounding lands	**Objective 3.1:** Identify federal lands or other lands adjacent to the NWA that should be protected.	• Conduct a landscape analysis to identify habitat conservation gaps as well as habitat conservation opportunities, and establish a conservation strategy. **(2)** • Assess the ecological value and conservation potential of habitats and species at risk on lands adjacent to the NWA that should be protected. **(3)**
	Objective 3.2: Integrate into the NWA federal lands or other lands adjacent to the NWA that have ecological value.	• Take the necessary steps to incorporate into the NWA federal lands with ecological value, such as the Gros-Cacouna Marsh and the Tourbière du Plateau de L'Isle-Verte. **(1)** • Consolidate the territory of the NWA by incorporating adjacent lands in order to conserve important habitats for species at risk and biodiversity. **(3)** • Review the legal description of the NWA. **(1)**
	Objective 3.3: Limit the possible impact of human activities on lands adjacent to the NWA.	• Align the NWA's public outreach, wildlife/habitat conservation and recreational activities with those of the Kiskotuk coastal park. **(1)**
	Objective 3.4: Protect natural habitats on federal lands adjacent to the NWA that have ecological value.	• Protect the important habitats of the Gros-Cacouna Marsh and Tourbière du Plateau de L'Isle-Verte. **(2)** • Assess the need to take action at the Gros-Cacouna Marsh to limit invasion of potential Yellow Rail habitat by cattails. **(2)**
Goal 4: Ensure ecological monitoring of the NWA and improve knowledge of wildlife species and their habitats. **Threats and challenges:** • Scientific knowledge gaps	**Objective 4.1:** Develop and implement an ecological monitoring plan.	• Identify the indicators and follow-up methodologies of the ecological monitoring program. **(1)** • Implement the ecological monitoring plan. **(2)**
	Objective 4.2: Fill priority gaps in scientific knowledge.	• Update the knowledge acquisition plan on the basis of the NWA conservation plan and recent plant and animal surveys. **(1)** • Implement resource surveys and monitoring priorities (e.g., species at risk, invasive plants, marsh birds, habitat characterization) in collaboration with local and government stakeholders. **(2)** • Confirm the presence and nesting of species at risk in the NWA and certain adjacent habitats (Gros-Cacouna Marsh and Tourbière du Plateau de L'Isle-Verte). **(2)** • Assess the impacts of certain human activities on the NWA (e.g., hunting, agriculture). **(2)**

Table 9: Management Approaches for Baie de L'Isle-Verte Wildlife Management Area (continued)

Goals	Objectives	Actions (Priority Level[1])
		• Identify and communicate research priorities to encourage scientific work in the NWA. **(1)** • Promote research collaborations with educational institutions and certain departments. **(2)** • Promote research on climate change impacts in the NWA. **(3)**
Goal 5: Raise awareness among the public and regional communities about the conservation of the NWA, wildlife species and their habitats. **Threats and challenges:** • Impact of human activities • Development of surrounding lands • Accidental spills	**Objective 5.1**: Encourage public and regional community outreach and communication activities on the importance of conservation and the role of the NWA.	• Contribute to the development of the theme, activities, and conditions of an outreach program that would be supported by the CWS. **(2)** • Align the communications activities of collaborators (e.g., Société du parc Kiskotuk) in the NWA. **(1)**
	Objective 5.2: Ensure that the facilities and infrastructure are in good condition and safe for visitors.	• Develop a public safety plan. **(1)** • Conduct annual inspections of facilities and infrastructure. **(1)** • Identify the need for structures limiting access to the NWA (stop blocks, signage). **(1)** • Ensure routine maintenance of facilities and infrastructure, including trails and the Maison Girard. **(1)**
	Objective 5.3: Promote local community awareness and involvement in the conservation of the NWA and adjacent lands.	• Encourage the conservation outreach and education initiatives of local communities (e.g., Société du parc Kiskotuk and the Maliseets of Viger First Nation. **(3)** • Increase local community awareness of the conservation of the area through the development of outreach tools. **(3)** • Promote the maintenance of connectivity areas for species that have large home ranges, have a precarious status, or are of specific interest, as well as important biodiversity areas outside the NWA. **(3)** • Raise the awareness of managers and adjacent land owners of the importance of best habitat management practices and their benefits to the NWA. **(2)** • Encourage regional conservation initiatives (e.g., projects on species at risk, stewardship projects) in the NWA and surrounding lands, and promote the maintenance of buffer zones and ecological corridors. **(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 level of priority assigned to the actions refers to the implementation timeline and not to their importance in terms of resource conservation. Priorities may change depending on the context and available resources.

5 MANAGEMENT APPROACHES

Table 9 outlines the approaches that could be used in the management of Baie de L'Isle-Verte NWA and of adjacent federal lands having ecological value. However, specific management actions will be determined during the annual work planning process and will be implemented as financial and human resources allow, in accordance with the approaches described below.

5.1 HABITAT MANAGEMENT

Habitat management will be focussed on the conservation of important habitats for the American Black Duck, the recovery of species at risk, and the protection of critical habitat of species at risk and important habitats for other wildlife species. Specific conservation sectors could be defined for the management of the fragile species of the NWA.

Lands of ecological interest that are important to protect, such as the Gros-Cacouna Marsh and Tourbière du Plateau de L'Isle-Verte, could be added to the territory of the NWA to promote the preservation of valuable wildlife habitats.

5.2 WILDLIFE MANAGEMENT

Wildlife management activities will be based on the knowledge acquired through the surveys, which will provide updates on various aspects of the biodiversity of the NWA. Monitoring efforts could be carried out to support better understanding and management of waterfowl populations, including the American Black Duck, a representative species of the NWA, and a number of species at risk. Three- or five-year monitoring of the hunt could be carried out to assess its impact on waterfowl populations in the NWA and surrounding area. Through collaboration on research or monitoring projects with various government and university specialists as well as regional environmental organizations, it will be possible to ensure the best possible protection of species at risk. The recommendations made in species at risk recovery strategies will guide the identification and protection of critical habitat in the NWA and surrounding area.

5.3 MONITORING

The implementation of an ecological monitoring program over the next five years is planned in order to assess the ecological health status of the NWA and to gather information that will be useful for management decision making. This program will be based on the biological follow-up studies conducted internally (e.g., annual follow-up of the American Black Duck

population and waterfowl through banding), the follow-up of agricultural activities (pesticide and fertilizer use, crop types), and follow-ups conducted in collaboration with regional and provincial partners. Ecological monitoring efforts will focus specifically on habitats (healthy or restored), species at risk, representative species of the NWA (e.g., waterfowl), and ecological and human stresses on the area (e.g., landscape fragmentation, hunting, and invasive plants). Follow-up activities could be carried out in collaboration with various local stakeholders to increase the effectiveness and sustainability of the monitoring program.

5.4 RESEARCH

Knowledge acquisition and research needs have been established for various plant and animal groups and for the threats and management challenges associated with Baie de L'Isle-Verte NWA. In this regard, the updating of a knowledge acquisition plan based on the current NWA conservation plan is being considered. One of the priorities is to better document the presence of species at risk (e.g., Yellow Rail, Canada Warbler) and their critical habitat, management issues (e.g., certain wildlife habitat enhancements), ecological stresses (invasive species), and the impacts of human activities (e.g., waterfowl hunting, the impact of land drainage and agriculture on habitats). It would also be desirable to acquire a better understanding of the biological diversity of the NWA and adjacent federal lands, including the Gros-Cacouna Marsh and the Tourbière du Plateau de L'Isle-Verte (e.g., vascular plants and rare plants, forest stands and nesting waterfowl).

To obtain a permit to conduct research in Baie de L'Isle-Verte National Wildlife Area and to receive instructions concerning guidelines for a research proposal, please contact:

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

5.5 PUBLIC INFORMATION AND OUTREACH

Given that Baie de L'Isle-Verte NWA is open to the public in designated sectors, Environment and Climate Change Canada can authorize outreach activities there. These activities can be carried out by municipalities and conservation organizations under the authority of a permit.

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 activities that are prohibited (subsection 3[1]) in the wildlife area and provide mechanisms for the Minister of the Environment and Climate Change 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 a 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. However, in addition to notices, certain activities may be authorized by obtaining a permit from the Minister of the Environment and Climate Change.

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 part thereof. 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.

For Baie de L'Isle-Verte NWA, notices prohibiting entry would be posted at the Maison Girard and in the three parking lots of the NWA (at the Maison Girard and on the Sentier de la Spartine and Sentier des Roitelets). A notice would also be posted at the Gros-Cacouna Marsh parking lot (outside the NWA).

The NWA is open to the public year-round, but access is restricted to designated areas, unless otherwise indicated in notices published in local newspapers or posted at the entrance to or along the boundaries of the NWA. Persons holding migratory bird hunting permits can access the migratory bird hunting zones in the NWA from the end of September to the end of December. However, access is restricted to the areas indicated in the notices posted at the site. Visitors must comply with all other restrictions unless they have a permit issued by the Minister.

For Baie de L'Isle-Verte National Wildlife Area and the Gros-Cacouna Marsh, entry is prohibited in the following situations:

- hiking off established trails;

- using off-road vehicles (ORVs), snowmobiles or bicycles other than on access roads open to the public.

6.2 AUTHORIZED ACTIVITIES

The following activities are compatible with the conservation goals and objectives set out in this management plan and are therefore authorized in the NWA: hiking, nature viewing and photography on established trails, picnicking in authorized areas, agriculture with permits on lots reserved for this purpose, and hunting of migratory game birds (waterfowl) in designated areas.

6.2.1 Hiking, Nature Observation, Photography and Picnicking

These activities are authorized year-round and are restricted to the trails and designated facilities and infrastructure of the NWA, such as lookouts and service areas. Hiking with pets (cats and dogs only) is authorized on trails only, And pets must be kept on a leash. Picnicking is authorized at designated sites, namely benches, picnic tables and lookouts.

6.2.2 Agriculture With Permit on Designated Lots

The Canadian Wildlife Service issues permits to local farmers authorizing agricultural activities on certain lands within the NWA (roughly 65 ha) and on adjacent federal lands (roughly 70 ha) (2008-2012 leases, Figure 4) under the *Wildlife Area Regulations*. The permits can be renewed annually for up to five years, depending on the needs of the producers and the CWS. The holders of agricultural permits must meet certain requirements, notably respecting the timing of tilling, mowing and harvesting, particularly in wildlife breeding and migration areas, and the production of crops attractive to wildlife or grasslands managed for nesting. They are also required to comply with provincial standards respecting solid and liquid manure application and storage, pesticide use, livestock grazing, and the maintenance of herbaceous strips along ditches and streams.

6.2.3 Migratory Bird Hunting

Waterfowl hunting has been a traditional activity in the L'Isle-Verte Marsh for several decades. Migratory bird hunting is authorized in the NWA provided the regulatory requirements respecting time periods, conditions, locations and hunting gear are met. It is prohibited at the following locations: the L'Isle-Verte Migratory Bird Sanctuary, the *aménagements* (wildlife habitat enhancements) Salicorne (Rivière des Vases), Roitelet, Soucy-Duvetnor, du Quai and Aboiteau Girard as well as an agricultural lot located east of Route du Quai, in L'Isle-Verte, for reasons of conservation and public safety (Figure 14).

6.2.4 Other Activities

All other activities are prohibited in this NWA, including small and large game hunting, snaring and trapping, fishing, use of motorized vehicles off official access roads and parking lots (e.g., all-terrain vehicles, motorcycles, snowmobiles), landing from a kayak or other craft, camping, cycling, cross-country skiing, and snow-shoeing.

A notice of all authorized activities in Baie de L'Isle-Verte NWA is posted at the Maison Girard. This notice is similar to that published in local newspapers.

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.

FEDERAL LANDS ADJACENT TO THE NWA

GROS-CACOUNA MARSH

This site is open to the public year-round at designated areas and for the activities listed below.

Hiking, nature observation, photography and picnicking are authorized only on established trails and at designated facilities and infrastructure, such as observation towers and blind. Pets (cats and dogs only) are authorized on trails provided they are kept on a leash. Picnicking is authorized at designated locations, namely benches, picnic tables and lookouts.

Migratory bird hunting is authorized only in part of Étang du Sud-Ouest (Figure 15), from temporary blinds, provided regulatory requirements respecting time periods, conditions and authorized hunting gear are met (a notice to this effect is published and posted each year). The hunting of migratory birds and other wild game is prohibited in the rest of the Gros-Cacouna Marsh. Environment and Climate Change Canada intends to prohibit migrating bird hunting at the Gros-Cacouna Marsh in future years because of the many complaints from residents, use conflicts with hikers and public security issues.

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.

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 and Climate Change Canada policy document is available on the Protected Areas website at http://www.ec.gc.ca/ap-pa/default.asp?lang=En&n=7FC45404-1.

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

National Wildlife Area – Permit Request
Environment and Climate Change Canada, Canadian Wildlife Service
Quebec Region
801-1550 D'Estimauville Avenue
Québec QC G1J 0C3
Email: permisSCFQuebec@ec.gc.ca

6.4 EXCEPTIONS

The following activities do not require a permit or authorization:

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

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 your regional federal or provincial permitting office.

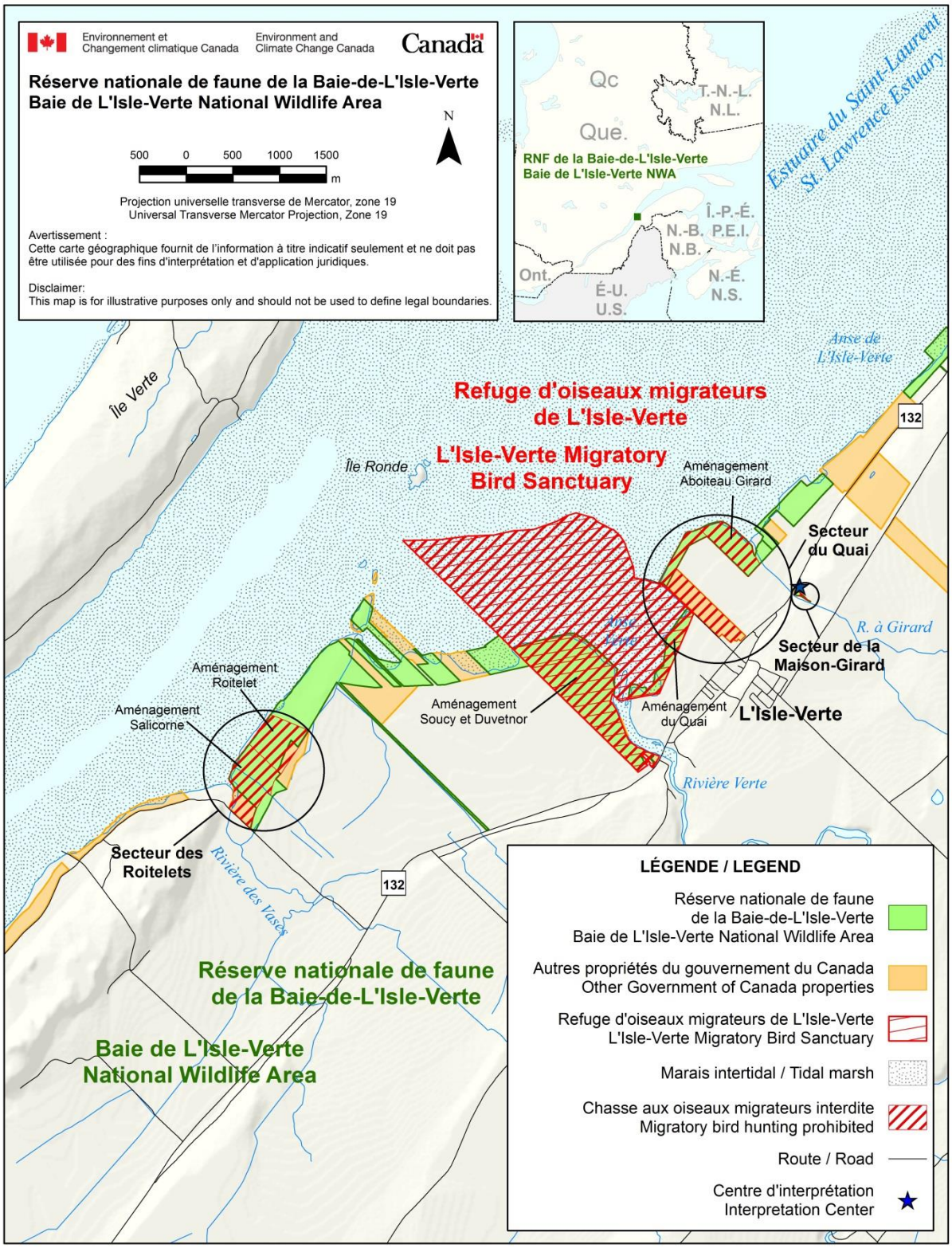

Figure 14: Areas in Baie de L'Isle-Verte NWA where migratory bird hunting is prohibited

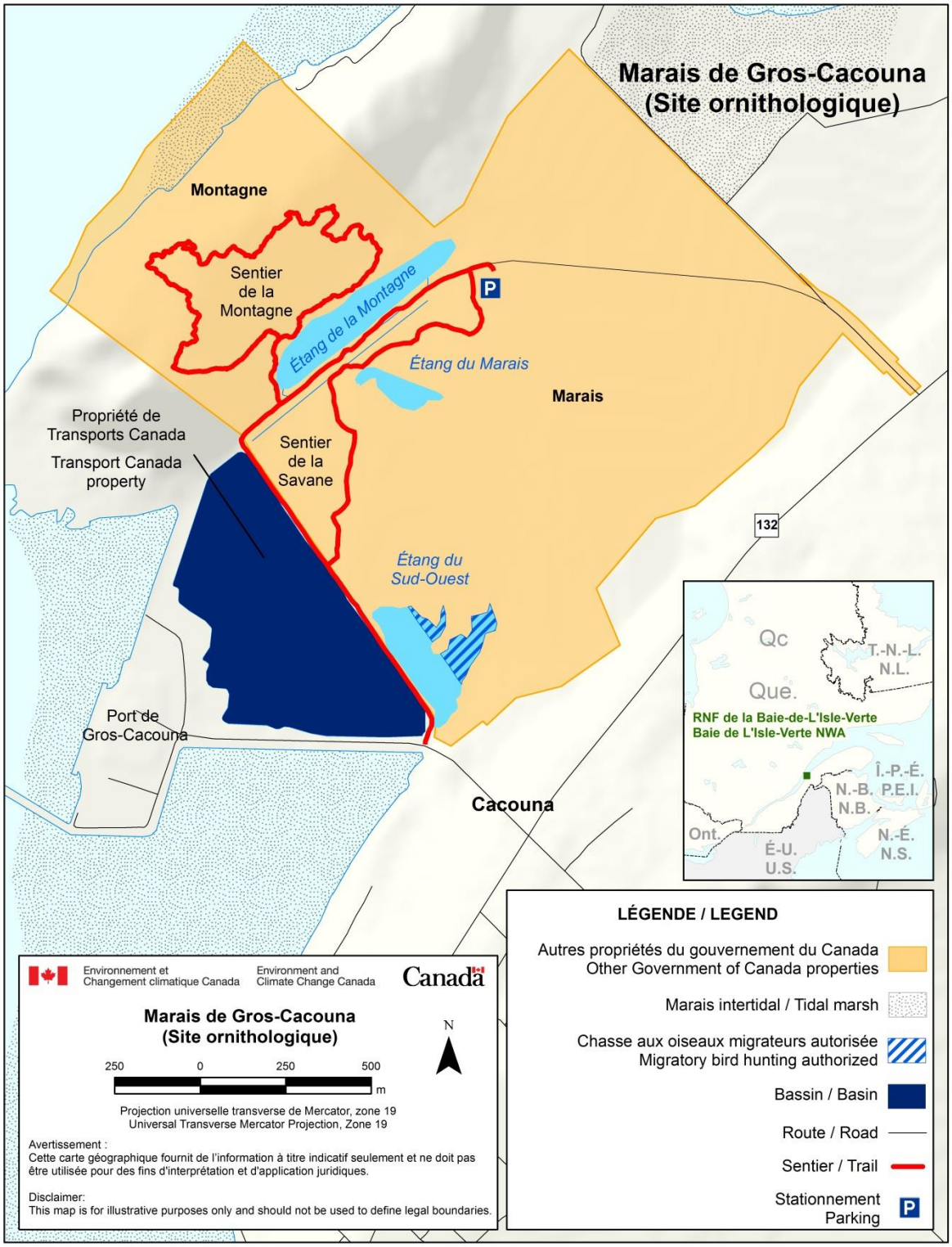

Figure 15: Areas at the Gros-Cacouna Marsh where migratory bird hunting is authorized
Note: Environment and Climate Change Canada intends to prohibit migrating bird hunting at the Gros-Cacouna Marsh in future years.

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. Furthermore, Environment and Climate Change Canada staff will take all reasonable and necessary precautions to assure their own health and safety and 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 to ensure their own safety, recognizing that Environment and Climate Change Canada staff neither regularly patrol nor offer services for visitor safety in this NWA. Environment and Climate Change Canada plans to develop a public safety plan to limit the risk of incidents and to ensure public safety in the NWA.

To report an environmental emergency, please contact the Canadian Environmental Emergencies Notification System at the following telephone numbers:

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

Incidents or emergency situations can be reported to:

- Maritime Rescue (Canadian Coast Guard): 1-800-463-4393/cell: *16
- Sûreté du Québec: 310-4141/cell: *4141
- Civil Protection: 1-866-776-8345/cell: 911
- SOS-Poaching: 1-800-463-2191
- Environmental emergency: Environment and Climate Change Canada: 1-866-283-2333 or the Quebec Department of Sustainable Development, Environment, and Fight against Climate Change (MDDELCC): 1-866-694-5454
- Forest fires: SOPFEU: 1-800-463-3389
- Local authorities (police or fire department): 911

8 ENFORCEMENT

The management of NWAs is based on three acts and the regulations there under:

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

Environment and Climate Change Canada's wildlife enforcement officers are responsible for ongoing surveillance of compliance with the acts and regulations and for conducting investigations, as required.

The following are examples of activities that, if carried out on NWAs without authorization, may constitute an offence:

- 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 and Climate Change 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 9.

10 COLLABORATORS

Collaboration with local agencies and sector organizations will be favoured to contribute to the protection and conservation of wildlife species and their habitats in Baie de L'Isle-Verte NWA. For instance, collaborations could be developed or pursued with universities and research centres to fill scientific knowledge gaps, with the province to implement species at risk recovery measures, particularly for species under provincial jurisdiction, and with non-governmental organizations and municipal authorities to increase public awareness of the conservation objectives of the NWA.

The main organizations likely to collaborate in the mission and activities of Baie de L'Isle-Verte NWA are listed below.

CEGEP de La Pocatière
Département de bioécologie
140, 4e avenue
La Pocatière (Québec) G0R 1Z0
Téléphone : 418-856-1525
Télécopieur : 418-856-4589

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

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
88 Saint-Germain Street West, Suite 101
Rimouski QC G5L 4B5
Tel.: 418-722-8833
Fax: 418-722-8831
Email: zipse@globetrotter.net

Corporation PARC Bas-Saint-Laurent
43 Alexandre Street, Suite 100
Rivière-du-Loup QC G5R 2W2
Tel.: 418-867-8882
Fax: 418-867-8732
Email: rgagnon@parcbsl.com

Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC) (Quebec Department 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
Tel.: 418-727-3511
Fax: 418-727-3849
Email : bas-saint-laurent@mddelcc.gouv.qc.ca

Ministère des Forêts, de la Faune et des Parcs (MFFP) (Quebec Department of Forests, Fauna and Parks)
Direction de la protection de la faune du Bas-Saint-Laurent (Bas-Saint-Laurent Wildlife Protection Branch) and Direction générale du Bas-Saint-Laurent (Bas-Saint-Laurent Branch)
92 2nd Street West, Suite 207
Rimouski QC G5L 8B3
Tel.: 418-727-3710, ext. 402
Fax: 418-727-3735
Email: bas-saint-laurent@mffp.gouv.qc.ca

Municipality of Cacouna
415 Saint-Georges Street
Cacouna QC G0L 1G0
Tel.: 418-867-1781
Fax: 418-867-5677
Email: municipalite@cacouna.ca

Municipality of L'Isle-Verte
141 Saint-Jean-Baptiste Street
L'Isle-Verte QC G0L 1K0
Tel.: 418-898-2812
Fax: 418-898-2788
Email: guyberube@lisle-verte.ca (chief executive officer)

Nature Québec
870, avenue De Salaberry, bur. 207
Québec (Québec) G1R 2T9
Téléphone : 418-648-2104
Télecopieur : 418-648-0991
Courriel : zico@naturequebec.org
Personne ressource : Marilyn Labrecque, responsable de la coordination du volet provincial du programme Zones importantes pour la conservation des oiseaux (ZICO)

Organisme de bassins versants de Kamouraska, L'Islet et Rivière-du-Loup
536, avenue de la Gare
Saint-Pascal (Québec) G0L 3Y0
Téléphone : 418-492-6135
Courriel : manon.ouellet@obakir.qc.ca
Personne ressource : Manon Ouellet, chargée de projets au volet sensibilisation

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

Regional County Municipality of Rivière-du-Loup
310 Saint-Pierre Street
Rivière-du-Loup QC G5R 3V3
Tel.: 418-867-2485
Fax: 418-867-3100
Email: administration@mrc-riviere-du-loup.qc.ca

Société du parc côtier Kiskotuk
310 Saint-Pierre Street
Rivière-du-Loup QC G5R 3V3
Tel.: 418-867-2485
Fax: 418-867-3100
Email: eblier@romm.ca; vbelanger@mrcrdl.quebec
Contact: E. Blier (Corporation PARC Bas-Saint-Laurent) and V. Bélanger (MRC de Rivière-du-Loup)

The Maliseets of Viger First Nation
217 De la Grève Street
Cacouna QC G0L 1G0
Tel.: 418-860-2393
Fax: 418-867-3418
Email: info@malecites.ca

Université du Québec à Rimouski
300 Allée des Ursulines
P.O. Box 3300, Station A
Rimouski QC G5L 3A1
Tel.: 418-723-1986
Toll free number: 1-800-511-3382
Fax: 418-724-1525
Email: uqar@uqar.ca

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